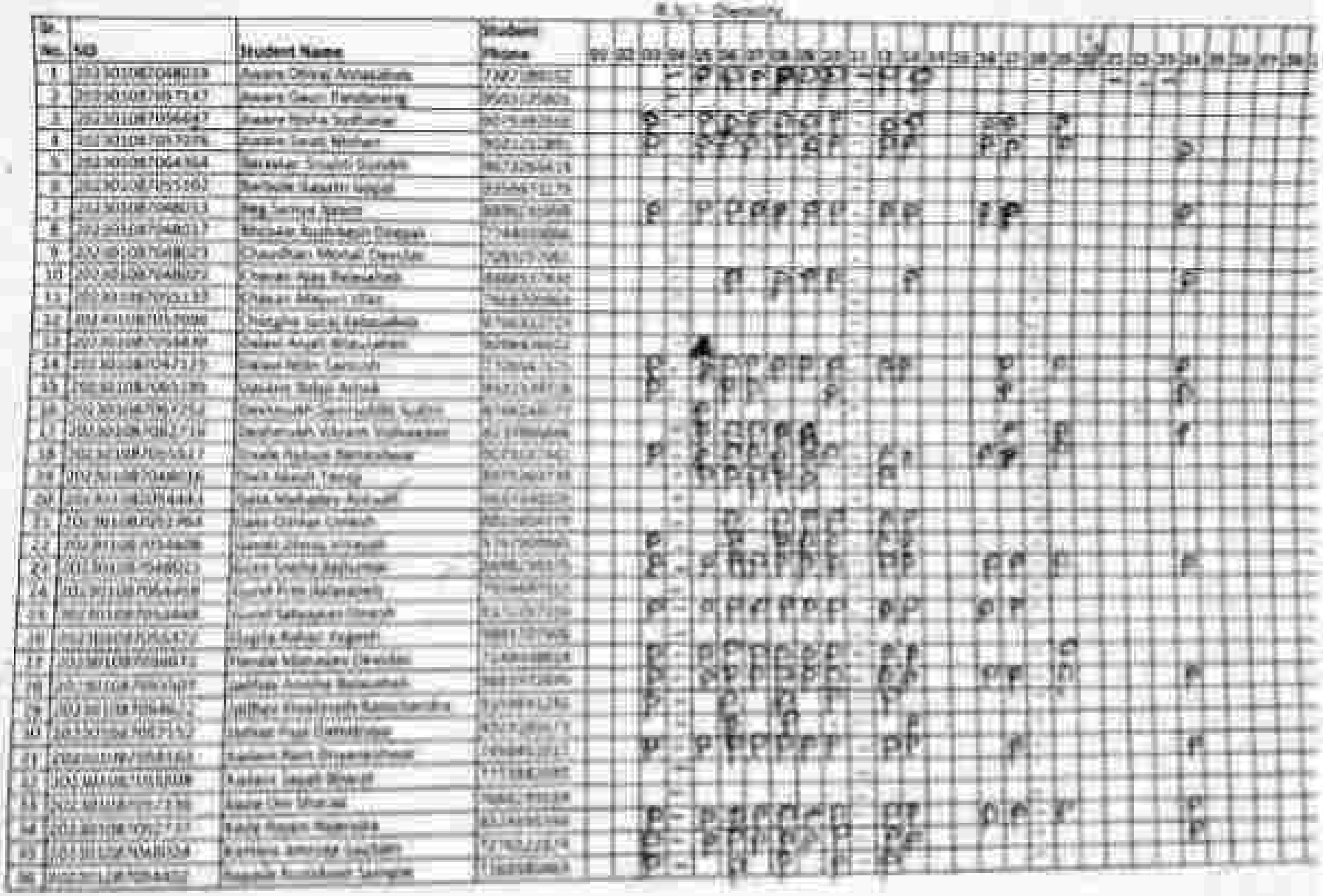

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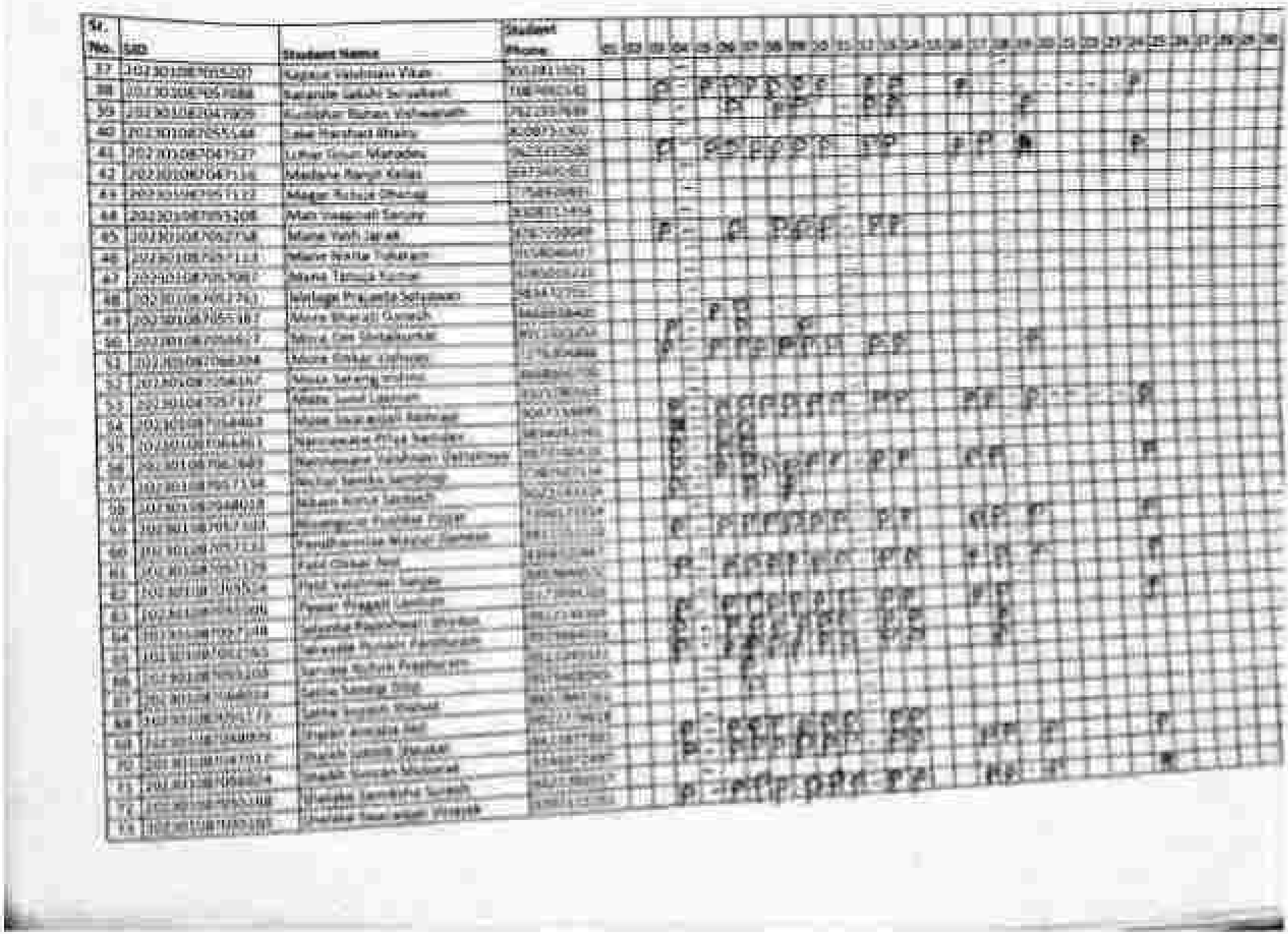
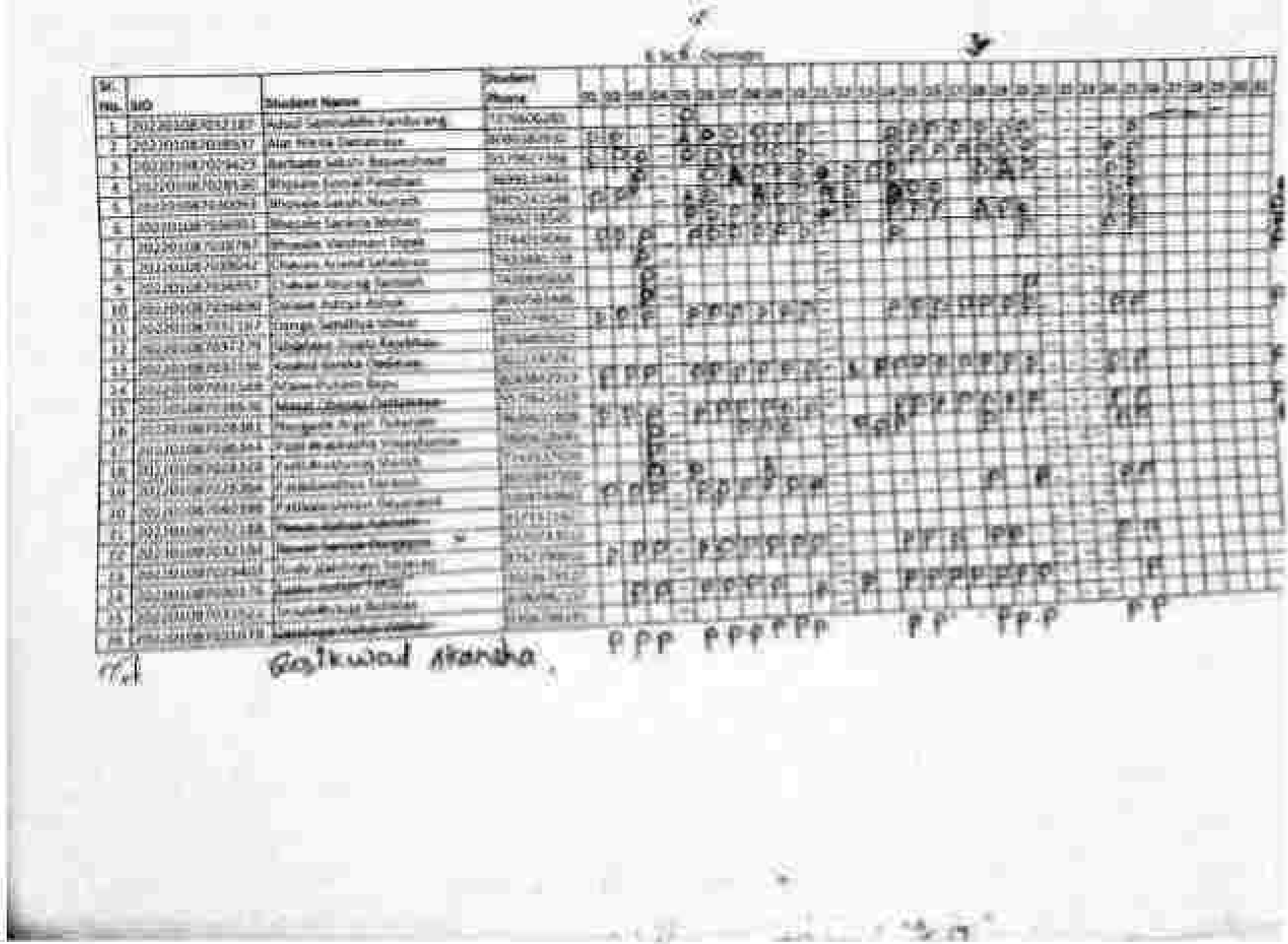
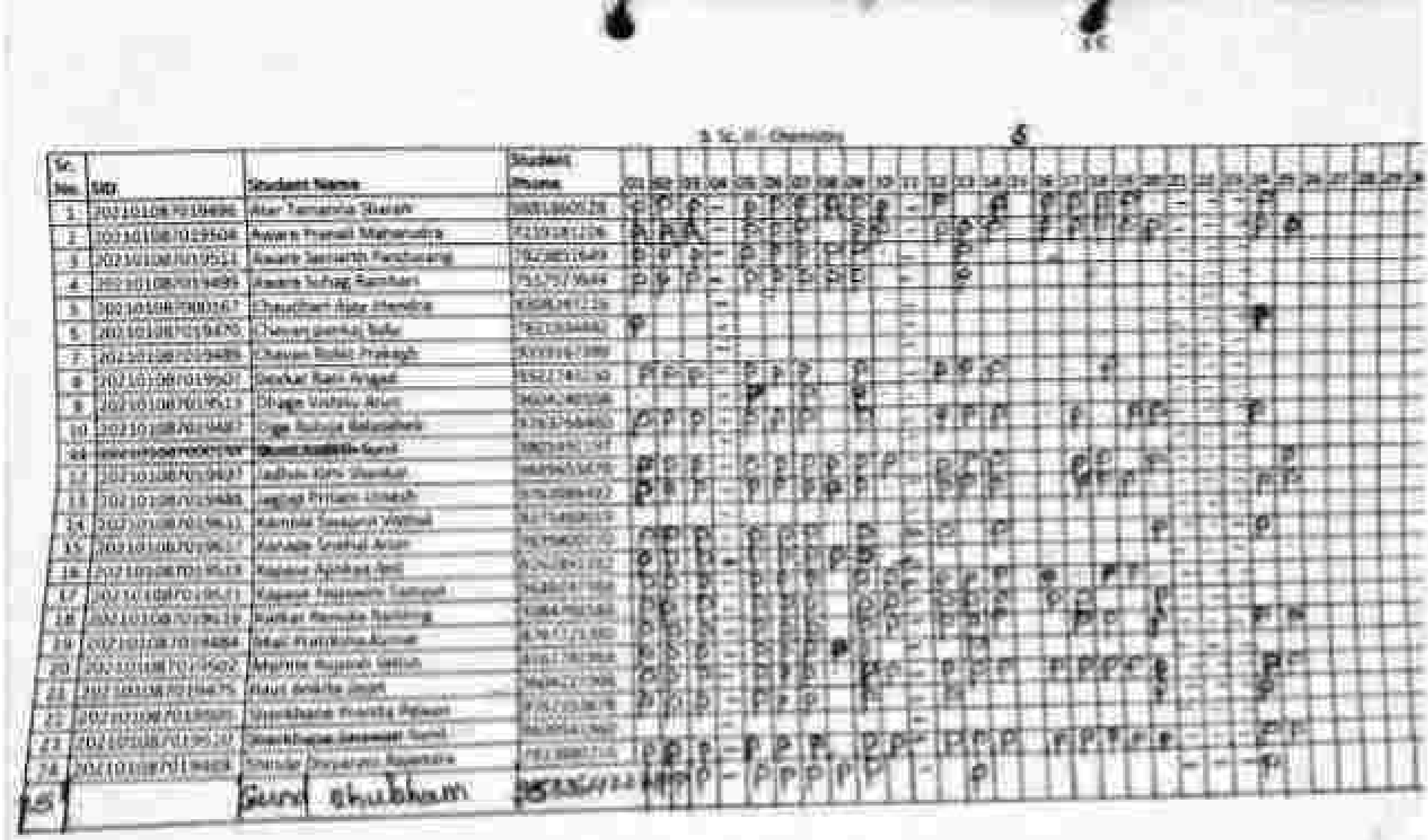


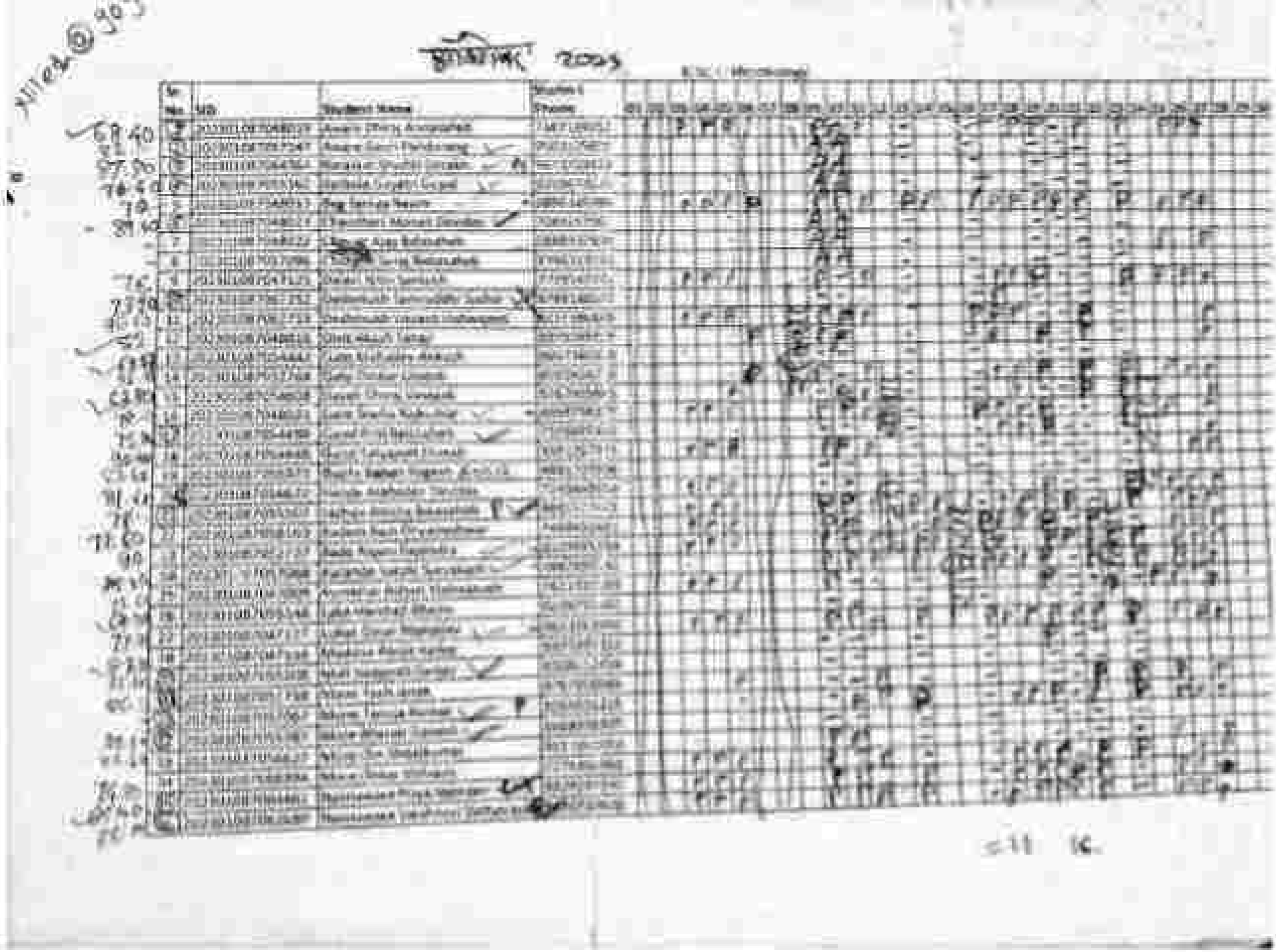
Sr. No.	SID	Student Name	Student Phone
37	202301087055207	Kapase Vaishnavi Vikas	9011841521
38	202301087057088	Salunke Lakshi Sevakant	7887455143
39	202301087047029	Kumbhar Rohan Vishwanath	7821559589
40	202301087055144	Lake Harshad Bhalu	8208731302
41	202301087047127	Luther Ishan Mandela	7841111580
42	202301087063116	Mahale Ranjit Kailas	8975405483
43	202301087057122	Magar Rutuja Dhanaji	7588510851
44	202301087053208	Mali Vaishnavi Sanjay	9420813414
45	202301087052748	Mane Yash Jairam	8767220549
46	202301087057113	Nilavar Sneha Tukaram	9112404617
47	202301087057087	Rana Tanuja Kumar	8390555220
48	202301087057263	Sarlinge Prajakta Satyawan	9834127...
49	202301087055187	More Bharati Ganesh	9422518420
50	202301087055193	Nimal Om Shivkumar	8975100454
51	202301087068204	Adure Onkar Ushaw	7588...
52	202301087056147	Mane Sanjay Vitthal	8888...
53	202301087057127	Mane Sunil Laxman	9767...
54	202301087064003	Mane Saurabh Ramesh	9067...
55	202301087064013	Narvekar Priya Sanjay	9881...
56	202301087063049	Narvekar Vaishnavi Vaibhav	7588...
57	202301087057148	Nikam Sanika Sandeep	9021...
58	202301087048028	Nikam Komal Santosh	7588...
59	202301087057103	Nilangekar Kushal Dilip	9881...
60	202301087057133	Pandharkamble Nikhil Santosh	8830...
61	202301087057178	Patil Onkar Anil	9421...
62	202301087055154	Patil Vaishnavi Sanjay	9881...
63	202301087057204	Pawar Prajakt Santosh	9881...
64	202301087057148	Salunke Rajeshwari Shankar	9881...
65	202301087063163	Salunkhe Ruchita Parmeshwar	9881...
66	202301087053205	Sarnobat Ruchita Prabhakar	9881...
67	202301087048024	Satpal Sanjay Dilip	9881...
68	202301087057179	Sathe Anjana Shahaji	9881...
69	202301087057178	Shelar Amruta Anil	9881...
70	202301087057212	Shelke Ujwala Sanjay	9881...
71	202301087056214	Shelke Sonam Mahavir	9881...
72	202301087057208	Shelke Samiksha Suresh	9881...
73	202301087057207	Shelke Sneha Vijay	9881...





B. Sc. III - Chemistry

Sr. No.	SID	Student Name	Student Phone
1	202101081019496	Alan Tamanna Shaikh	
2	202101081019504	Aware Pranali Mahendra	
3	202101081019511	Awate Sainath Panchaxarg	
4	202101081019489	Awate Suhag Ramdas	
5	202101081019467	Chaudhari Ajay Jitendra	
6	202101081019470	Chavan Ganesh Sidu	
7	202101081019488	Chavan Rohit Prakash	
8	202101081019507	Gaikar Rani Angad	
9	202101081019513	Ghage Vaibhav Arun	
10	202101081019487	Ghge Suhas Balasaheb	
11	[illegible]	[illegible]	
12	202101081019497	Jadhav Abhi Shankar	
13	202101081019483	Jagtap Pritam Umesh	
14	202101081019511	Kamble Swapnil Vitthal	
15	202101081019517	Kanade Snehal Arun	
16	202101081019518	Kapase Ajinkya Anil	
17	202101081019512	Kapase Tejaswini Sampat	
18	202101081019519	Kurkut Renuka Rambhau	
19	202101081019494	Mali Pratik Ashok	
20	202101081019502	Mujawar Nusrat Ismail	
21	202101081019475	Raut Ankita Jagat	
22	202101081019505	Shaikhsalim Hanafig Ajmeri	
23	202101081019510	Shaikhsana Jasmeen Sunil	
24	202101081019514	Shinde Priyanka Appasaheb	
25		Gurav Shubham	



2023 ऑक्टोबर B.Sc. I - Micro

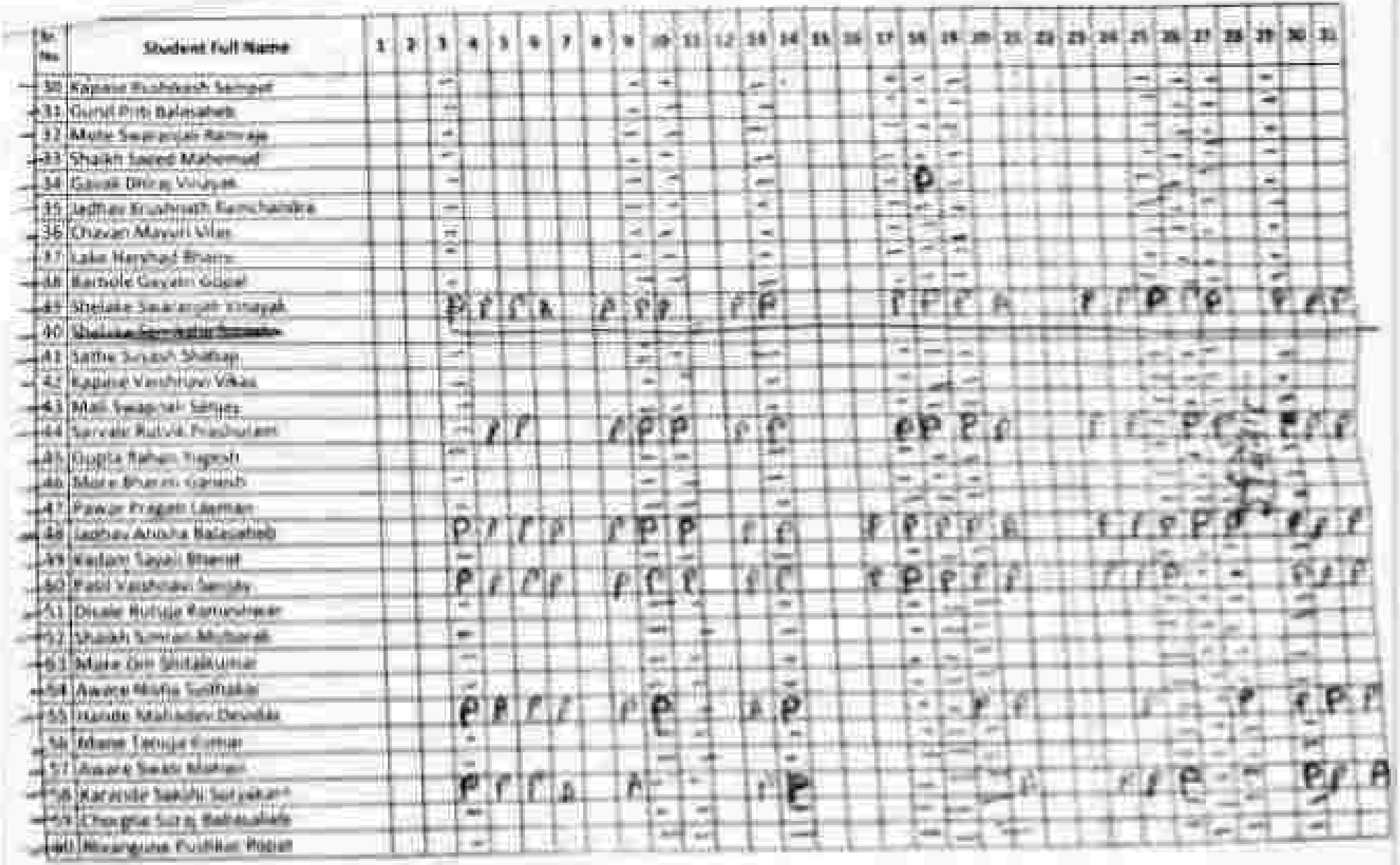
Sr. No.	PID	Student Name	Student Phone
37	202301087057144	Nichal Sandra Sambrajo	7387503134
38	202301087057203	Nivargune Pushkar Pravin	7501771534
39	202301087057132	Pandharpatte Mayuri Ramesh	9823551133
40	202301087057125	Patil Omkar Anil	9356220407
41	202301087055524	Patil Vaishnavi Sanjay	8459668533
42	202301087055506	Pawar Pragati Laxman	9172005704
43	202301087057148	Saluoke Rageshwari Shankar	9881246384
44	202301087055209	Sarvade Ruturaj Prabhakar	8411345511
45	202301087048009	Shaikh Ameena Abdul Rahim Sahib	9011779618
46	202301087047012	Shaikh Sakhib Shaukat	8421977431
47	202301087055368	Shaikh Sumaiya Mohammad Yunus	9552990527
48	202301087055165	Shelake Swarangali Vinayak	9421171152
49	202301087056435	Shinde Nilam Bharat	9890309910
50	202301087047013	Shinde Ravi Baban	7038383494
51	202301087047126	Sohar Sapna Sampatrao	8390979869
52	202301087048014	Waghat Sanket Vishnu	9359779813
53	202301087045518	Wadhwa Saurabh Ramchander	9673148912

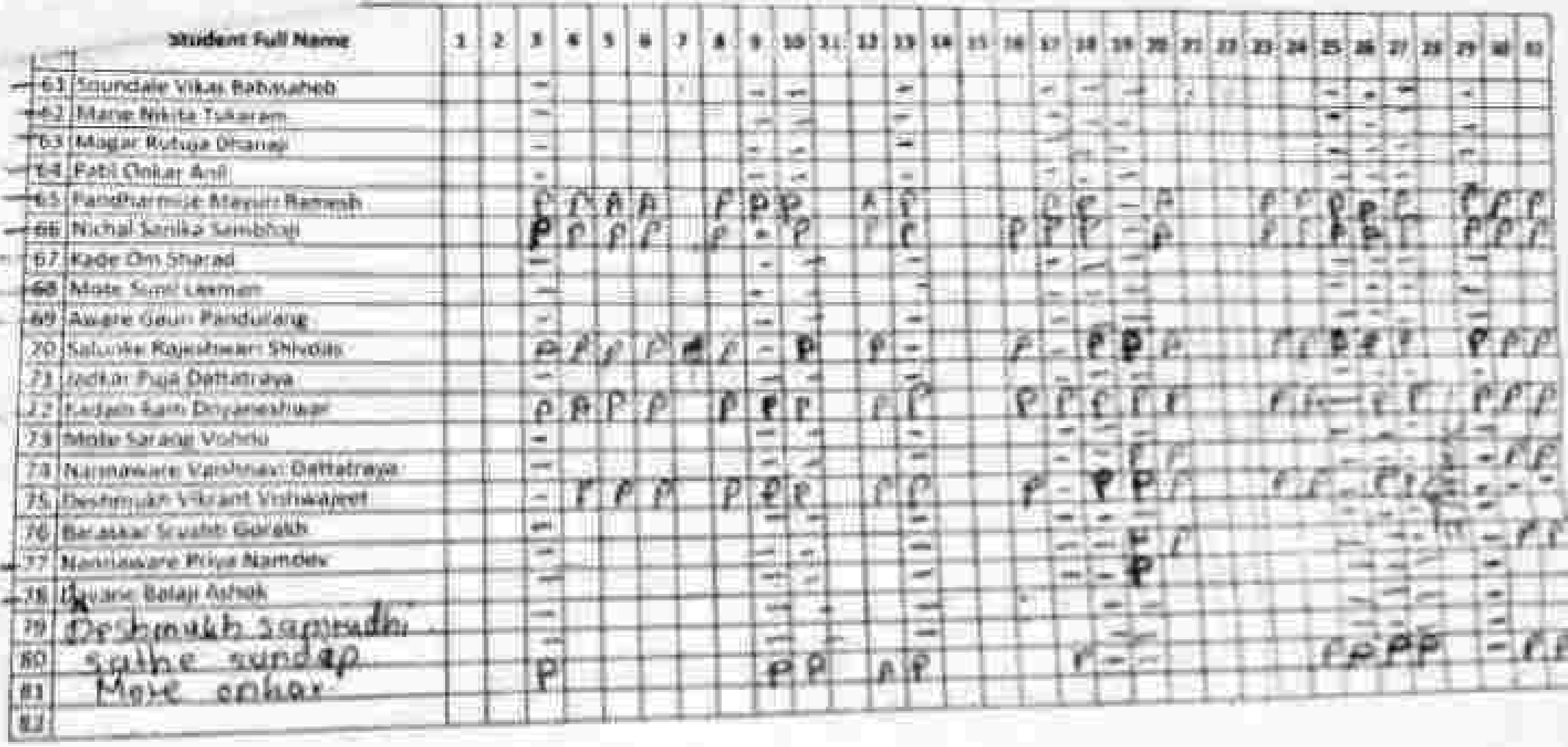
Total = 11

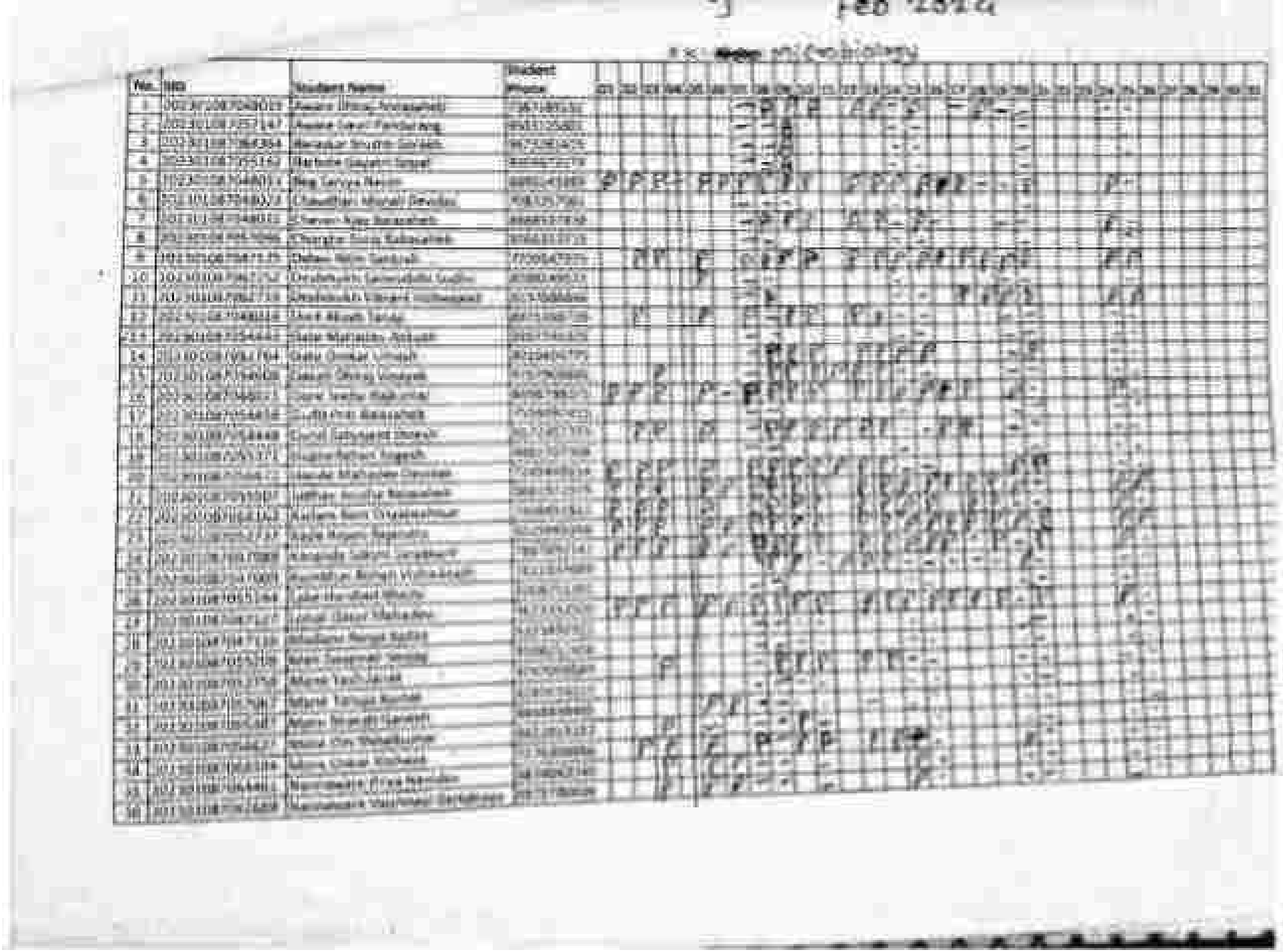
Month January. B.Sc. I - 2023-24 Attendance Microbiology

Sr. No.	Student Full Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	Kumbhar Rohan Vishwanath			—	P	P	P	P	P	—	—			P			—	—	—	—					—		P	P	—		
2	Shinde Ravi Kedari			—						—	—			—			—			P					—		—	—	—		
3	Shaikh Sakhib Shaukat			—					P	—	—			P			—			P	P				P			P	P		
4	Madane Ranjit Rajiv			—						—	—			—			—			—					—			—	—		
5	Dalavi Nitin Santosh			P	P	P	P		P	P	P		P	P			P	P	P	P					P			P	P		
6	Sutar Soniya Dnyaneshwar			—						—	—			—			—			—					—			—	—		
7	Lohar Gouri Mahadev			P	P	P	A		P	—	P			P			—		P	P					P			P	P		
8	Shaikh Abrisha Akil			—						—	—			—			—			—					—			—	—		
9	Pag Sonya Nasim			P	P	P	P		P	P	P			P			P		P	P					P			P	P		
10	Waykar Sanket Vimhal			P	P	P	P		P	P	P			P			P		P	P					P			P	P		
11	Dixit Akash Tanaji			P	A					—	P			P						P								—			
12	Bhosale Rushikesh Dnyaneshwar			—						—	—			—			—			—					—			—	—		
13	Nikam Rohit Santosh			—						—	—			—			—			—					—			—	—		
14	Awate Dhiraj Appasaheb			P	P	P	P		A	P	P			P			P		P						A			P	P		
15	Qazi Shaha Rafiuddin			—						—	—			—			—			—					—			—	—		
16	Chavan Asha Balasaheb			—						—	—			—			—			—					—			—	—		
17	Chaudhari Mehtab Devidas			—						—	—			—			—			—					—			—	—		
18	Kamble Amruta Gautam			—						—	—			—			—			—					—			—	—		
19	Chavan Shivani Mahadev			—						—	—			—			—			—					—			—	—		
20	Salgude Pritam Parshuram			P	P	P	P		P	P	P			P			P		P	P					P			P	P		
21	Patte Rajan Rajendra			—						—	—			—			—			—					—			—	—		
22	Mane Yash Ashok			—						—	—			—			—			—					—			—	—		
23	Mulage Prajakta Satyawan			P	P	P	A		A	—	—			A			—		P	P					A			P	P		
24	Qazi Omaar Umesh			—						—	—			—			—			—					—			—	—		
25	Shaikh Shravani Dadasaheb			—						—	—			—			—			—					—			—	—		
26	Shinde Kiran Bharat			—						—	—			—			—			—					—			—	—		
27	Dalavi Anjali Bhausaheb			—						—	—			—			—			—					—			—	—		
28	Qazi Mahadev Ashish			—						—	—			—			—			—					—			—	—		
29	Qazi Safeeque Umesh			—						—	—			—			—			—					—			—	—		

Male Surang.
Shaikh Simaan







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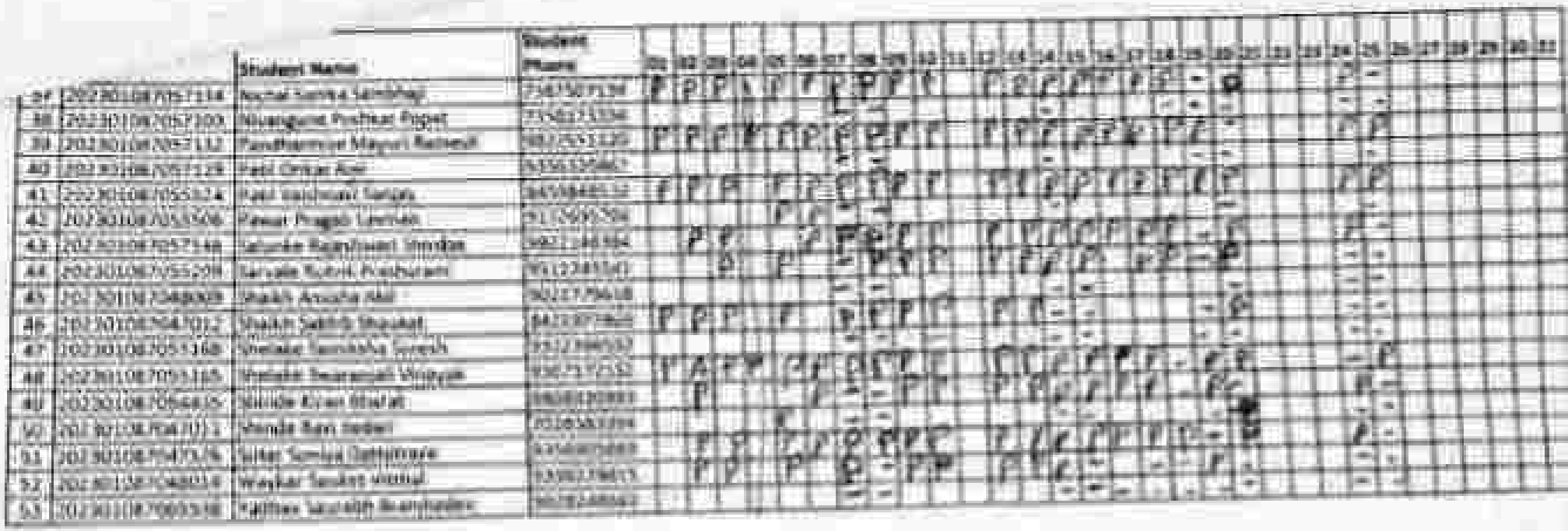

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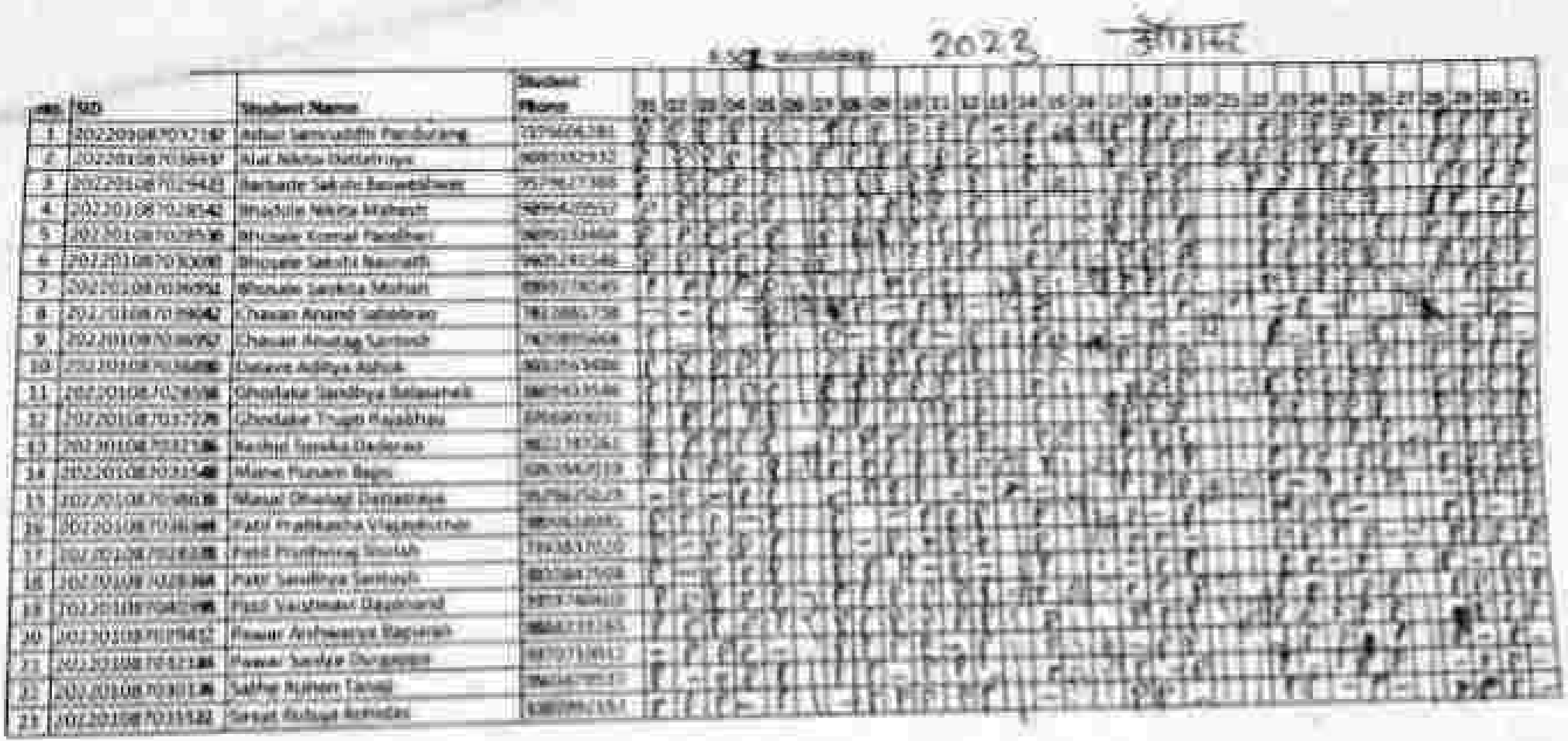
37	202301087057114	Nichal Sunita Sambhaji	7387507139
38	202301087057103	Mulegaonkar Prathmesh Popat	7350213336
39	202301087057132	Pandharinath Mayuri Rathnath	9021553125
40	202301087057129	Patil Omkar Ajay	9356335867
41	202301087055124	Patil Vaishnavi Sanjay	8459844855
42	202301087053506	Pawar Pragati Lakhan	7115505558
43	202301087057148	Salunke Rajeshwari Jitendra	9421348364
44	202301087055209	Sarvade Rutvik Prabhakar	9511238150
45	202301087048009	Shaikh Anusha Abid	9021739618
46	202301087048702	Shaikh Sakhib Shaukat	8421077860
47	202301087053168	Shelake Samiksha Suresh	9552396552
48	202301087053165	Shelake Swarangini Vitthal	9307577153
49	202301087056816	Shinde Kiran Shahaji	9881820883
50	202301087048703	Shinde Ram Indrajit	9518533394
51	202301087047376	Sitkar Somlal Dattatraya	8329807989
52	202301087048019	Waykar Sanjay Vitthal	9359219873
53	202301087055158	Yadhav Saurabh Ramchandra	9579249562



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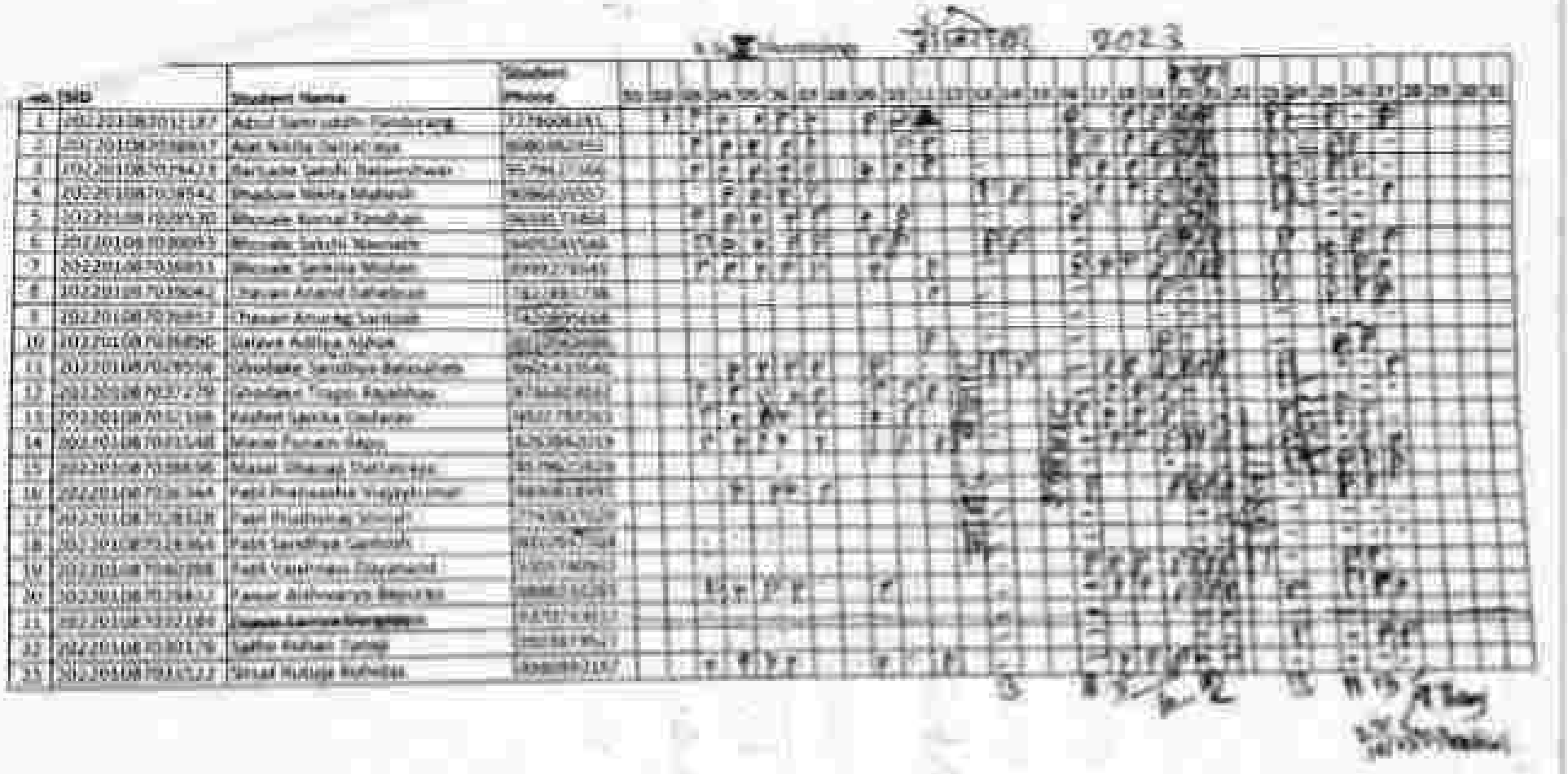
1	202209080703718?	Ansari Samiuddin Pandurang	7219606781
2	202208070138697	Alat Nikita Dattatraya	9881302913
3	202209080702948	Barbate Sakshi Baswateshwar	9579627886
4	202208070138742	Bhabhle Nikita Mahanth	9890420557
5	202301080702853?	Bhosale Komal Pandhari	9890134404
6	202208070703098	Bhopale Sakshi Nanarth	9890140346
7	202202080136952	Bhosale Sarjeta Mohan	8999278045
8	202208080709842	Chavan Anand Sahebrao	7822852738
9	202208080708987	Chavan Anurag Santosh	7620859468
10	202208080708886	Dalave Aditya Ashok	9881763486
11	202208080708598	Dhotkar Sandhya Balasaheb	8805433586
12	202208080703729	Dhotkar Trupti Rajabhau	8956903031
13	202208080703236	Kachgal Sneha Dadarao	9822187261
14	202208080703154	Maine Punam Bapu	8263687139
15	202208080708618	Mahul Dhanaji Dattatraya	9579675029
16	202208080708[illegible]	Patil Pratiksha Vijaysinha	8805433586
17	202208080708338	Patil Pratiksha Santosh	7263837030
18	202208080708368	Patil Sandhya Santosh	8830847508
19	202208080708[illegible]	Patil Vaishnavi Dagdunand	9823760033
20	202208080709842	Pawar Aishwarya Rajaram	9881731343
21	202208080708236	Pawar Sanjay Durgappa	8830719532
22	202208080708136	Sakhe Rutuja Tanaji	7841079513
23	202208080703582	Sangat Rutuja Ramdas	8805963351

Sr. No.	SID	Student Name	Student Phone
1	2022010870232187	Adeel Samruddin Pandurang	7276006281
2	2022010870258077	Atul Nikita Dattatraya	8080182111
3	2022010870219419	Barbade Sakshi Rajvardhan	9579821999
4	2022010870232042	Bhadane Nikita Mahesh	9970642553
5	2022010870235180	Bhosale Komal Pandhari	9049133484
6	2022010870230995	Bhosale Sakshi Nivrutti	9405218485
7	2022010870236811	Bhosale Sakshya Mohan	8999176545
8	2022010870219042	Chavan Anand Sahadev	7620881738
9	2022010870219957	Chavan Anurag Santosh	7620101608
10	2022010870216850	Dalavi Nikita Ashok	9011595486
11	2022010870219556	Ghodake Sandhya Balasaheb	9607453186
12	2022010870237279	Ghodake Trupti Rajendra	8766203333
13	2022010870232186	Kashid Sarika Dadaso	9823187242
14	2022010870231568	More Purani Bapu	8149842029
15	2022010870230530	Mukul Dhanaji Dattatraya	9579821999
16	2022010870236366	Patil Prabhavati Vijaykumar	9970642553
17	2022010870238328	Patil Prathamesh Manoh	7745837229
18	2022010870232804	Patil Sandhya Santosh	9970642553
19	2022010870240208	Patil Vaishnavi Gangadhar	9405218485
20	2022010870219422	Pawar Aishwarya Rajaram	8999176545
21	2022010870232184	Pawar Sanjay Dangesh	7620881738
22	2022010870230720	Sathe Radhika Nitin	9970642553
23	2022010870219227	Tarkar Ramya Ashokrao	8380092239



No.	PRN	Student Name	Student Phone
1	202201081011187	Abdul Samiuddin Fardiwang	7776008181
2	202201081018817	Aditi Nikita Dattatraya	8080882111
3	202201081017843	Bansode Sakshi Balasaheb	7798[illegible]
4	202201081013842	Bhadane Nikita Mahesh	9096[illegible]
5	202201081010570	Bhosale Komal Pandhari	7447[illegible]
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7	202201081016851	Bhosale Sanjivni Mohan	8999[illegible]
8	202201081018042	Chavan Anand Sahebrao	7620[illegible]
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10	202201081018290	Dalave Aditya Ajinath	[illegible]
11	202201081014518	Ghodake Sanjivni Balasaheb	9823[illegible]
12	202201081012750	Gholkar Tejas Rajabhau	8788[illegible]
13	202201081015188	Kadlag Sarika Gadarao	9637[illegible]
14	202201081011448	Mane Pavan Bapu	8793[illegible]
15	202201081011[illegible]	Masal Dhanaji Dattatraya	9579[illegible]
16	202201081012[illegible]	Patil Prajwalsha Vijaykumar	[illegible]
17	202201081013[illegible]	Patil Rushikraj Vinod	7743[illegible]
18	202201081018[illegible]	Patil Sandhya Santosh	9421[illegible]
19	202201081016[illegible]	Patil Vaishnavi Dayanand	9307[illegible]
20	202201081012[illegible]	Pawar Aishwarya Bapurao	9881[illegible]
21	202201081012[illegible]	Pawar Samruddhi	8830[illegible]
22	202201081013[illegible]	Sadhu Rohan Dattaji	9970[illegible]
23	202201081010[illegible]	Shaikh Rafiqa Rafiqbhai	8888[illegible]

B.Sc. Microbiology 2024 January

no.	PRN	Student Name	Student Phone	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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3	2022010870214[illegible]	Barbole Sakshi Baneshwar	8975[illegible]																															
4	2022010870265[illegible]	Bhadale Nikita Mahesh	9356[illegible]																															
5	2022010870285[illegible]	Bhosale Komal Pandhari	9699[illegible]																															
6	2022010870280[illegible]	Bhosale Sakshi Ravnath	9405[illegible]																															
7	2022010870369[illegible]	Bhosale Sankita Mohan	8999[illegible]																															
8	2022010870390[illegible]	Chavan Anand Sahebrao	7822[illegible]																															
9	2022010870369[illegible]	Chavan Anurag Santosh	9422[illegible]																															
10	2022010870368[illegible]	Dalavi Aditya Ashok	9011[illegible]																															
11	2022010870285[illegible]	Ghodke Sandhya Balasaheb	8605[illegible]																															
12	2022010870277[illegible]	Ghodke Trupti Rajabhau	8796[illegible]																															
13	2022010870321[illegible]	Kashidarika Dadarao	9022[illegible]																															
14	2022010870311[illegible]	Manepuram Bapu	8275[illegible]																															
15	2022010870388[illegible]	Mapa[illegible]hanaji Dattatraya	9579[illegible]																															
16	2022010870368[illegible]	Patil Nethrasha Vijaysinh	9970[illegible]																															
17	2022010870283[illegible]	Patil Rutuhiraj Shirish	7743[illegible]																															
18	2022010870388[illegible]	Patil Sandhya Santosh	8010[illegible]																															
19	2022010870404[illegible]	Patil Vaishnavi Dayanand	9970[illegible]																															
20	2022010870378[illegible]	Pawa[illegible]hwanya Rajendra	8888[illegible]																															
21	2022010870321[illegible]	Pawa[illegible]anya Durgappa	9970[illegible]																															
22	2022010870301[illegible]	Sathe[illegible]khan Tanaji	8421[illegible]																															
23	2022010870315[illegible]	Shra[illegible]shila Rohidas	8380[illegible]																															

Feb 2024

	PRN No.	Student Name	Student Phone
1	2022010870312187	Adsul Samruddhi Pandurang	7219476283
2	2022010870389937	Alat Nikita Dattatraya	9689282431
3	2022010870259423	Bachade Sakshi Basweshwar	9579123796
4	2022010870285412	Bhadane Nikita Mahesh	9096420997
5	2022010870265530	Bhosale Komal Pandhari	9420114494
6	2022010870308291	Bhosale Sakshi Ramnath	9405241480
7	2022010870316951	Bhosale Sanjita Mohan	8999128545
8	2022010870398342	Chavan Ananta Sahadev	9823861738
9	2022010870389457	Chavan Anurag Santosh	9423895466
10	2022010870368890	Dalavi Aditya Ashok	9011054489
11	2022010870285566	Ghadge Sandhya Balasaheb	8605433546
12	2022010870372279	Ghodake Trupti Rajashree	9766803004
13	2022010870321686	Kadhe Sanika Nadaraj	9021387255
14	2022010870315449	Mane Ayush Bapu	8263810997
15	2022010870388606	Misal Bharati [illegible]	9579437679
16	2022010870316441	Patil [illegible]	9890638981
17	2022010870316224	Pat[illegible]	[illegible]
18	2022010870328364	Patil Sandhya Santosh	9021864748
19	2022010870340398	Patil Vaishnavi Devanand	9356716881
20	2022010870273412	Pawar Aishwarya Rajendra	8668233285
21	2022010870321864	Pawar Sanjay Dattatray	[illegible]
22	2022010870301476	Sathe Mahesh Tanaji	9665439537
23	2022010870315722	Sonar Rutuja Ramdas	8380997137

Subject - Microbiology 2023 Month - ऑक्टोबर

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	Dhokar Dhiraj	–	P	P	P	–	P	P	P	–	P	P	P	P	P	P	P	P	–	P	P	P	P	–	P	–	P	P	–	P	P	P
2	Gund Swapnil Dashrath	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	Kakade Rajgauri Kalidas	P	P	–	P	P	P	–	P	–	P	P	–	P	P	P	P	P	–	P	P	P	P	P	P	–	P	P	–	P	P	P
4	Londhe Somnath Vilas	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	Nikam Tushar Dadarao	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	Riddi Abhishek Chandrakant	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	Salunke Vaibhav Vikas	P	–	–	P	P	P	–	P	–	P	P	P	P	P	P	P	P	P	P	–	P	P	–	P	P	P	P	–	P	P	P

Subject - Microbiology 2024 Month - [illegible]

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	[illegible] Omkar Bhanu	–	P	–	P	–	P		P	–	P	P	–	P	P	–	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
2	Garad Swapnil Dasharath	P	P	P	P	P	P		P	–	P	P	–	P	P	–	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Kakade Bhagwathi Keshav	P	–	P	P	–	P		P	P		P	P	P		P	P		P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Londhe Somnath Vilas	P	P	P	P	P	P		P	–	P	P	–	P	P	–	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Nikam Tushar Dadarao	P	P	P	P	P	P		P	P		P	P	P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Riddi Abhishek Chandrakant	P	P	P	P	P	P		P	P	P	P	P	P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Salunke Vaibhav Vikas	P	–	P	–	P	–		P	P	P	–	P	P	P	P	–	P	P	P	P	P	P	P	P	P	–	–	–	–	P	P

No.	SID	Student Name	Student Phone
1	202101087019465	Agalave Onkar Bharat	8796534135
2	202101087019526	Garad Swapnil Dashrath	9137685478
3	202101092000169	Lavidhe Somnath Vilas	8669713547
4	202101087019624	Nikam Tushar Dadaraо	9823939737
5	202103087019580	Rathi Abhishek Chandrakant	7078413604
6	202101087000177	Salunke Vaibhav Vikas	9850944467
7	201903250013518[illegible]	KakadeDhanshree Sahdev	[illegible]

Seminare

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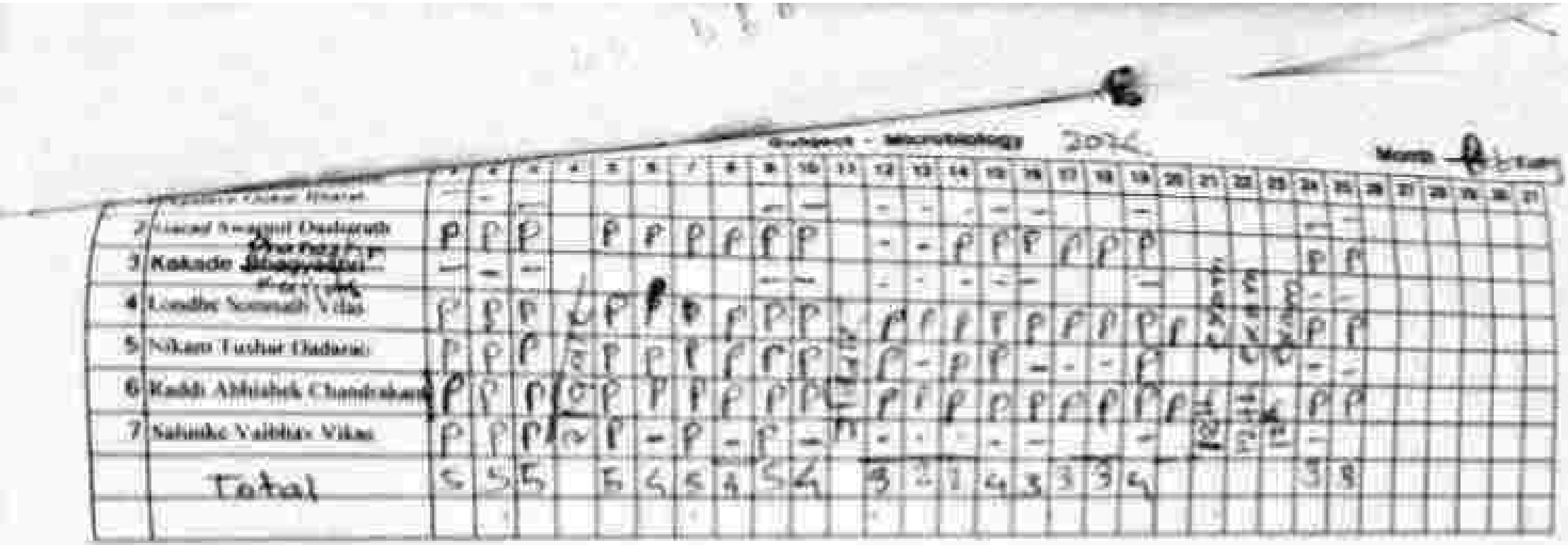

A Education is a letter to greater heights of knowledge

Tuljabhavani Mahila Mandal's

Hemuji Chandele College, Shelgaon (K).

Tal. Bardy, Dist. Solapur (Maharashtra) 413227

RESULT ANALYSIS 2023-2024
DEPARTMENT OF COMPUTER SCIENCE
B.Sc.-I Sem-I and II

SR. NO	STUDENT NAME	PAPER I	GRADE I	PAPER II	GRADE II	PAPER III	GRADE III	PAPER IV	GRADE IV	Percentage %
	Aware Nisha Sudhakar	28	B+	28	B+	38	A+	38	A+	72.92 %
	Aware Swati Mohan	32	A	31	A	40	O	39	A+	76.91 %
	Chavan Mayuri Vilas	33	A	35	A+	38	A+	41	O	78.58 %
	Dalavi Anjali Bhausaheb	26	B+	27	B	42	O	37	A+	42.42 %
	Dewane Balaji Ashok	30	A	28	B+	37	A+	32	A	68.75 %
	Dhale Rutuja Rameshwar	27	B	26	B+	37	A+	36	A+	70.42 %
	Jadhav Krushnath Ramchandra	30	A	31	A	38	A+	37	A+	69.60 %
	Jadkar Pooja Dattatray	30	A+	29	B+	41	O	38	O	78.42 %
	Kandhale Amruta Gautam	37	A+	36	A	44	O	44	O	78.42 %
	Kapase Krushnath Sampat	29	B+	30	A	34	A	36	A+	67.58 %
	Magar Rutuja Dhanaji	28	B+	29	B+	33	A	38	A+	67.58 %
	Mane Rekha Tukaram	30	A	28	B+	39	A+	36	A+	68.92 %
	More Swarangini Ramraje	35	A+	35	A+	42	O	44	O	78.83 %
	Nikam Rohit Santosh	28	B+	28	B+	32	A	33	A	61.83 %
	Sangale Puram Parashuram	40	O	37	A+	49	O	45	O	85.33 %
16	Sathe Sandip Dilip	35	A+	32	A	36	A+	35	B+	53.67 %
17	Sathe Sujesh Shahaji	34	A	32	A	40	O	40	O	53.00 %

18	Shaikh Simran Mubarak	40	O	30	A+	40	O	40	O	79.82 %
19	Saundale Vikas Babasaheb	35	A+	30	A+	40	O	35	A+	67.09 %

SUMMARY OF GIVEN PAPER of COMPUTER SCIENCE

SR. NO.	PAPER I	TOTAL No of student	PAPER II	TOTAL No of student	PAPER III	TOTAL No of student	PAPER IV	TOTAL No of student
1	O+	0	O+	0	O+	0	O+	0
2	O	2	O	0	O	0	O	1
3	A+	5	A+	5	A+	2	A+	20
4	A	6	A	4	A	3	A	2
5	B+	5	B+	3	B+	0	B+	0
6	B	1	B	3	B	0	B	0
7	C+	0	C+	0	C+	0	C+	0
8	C	0	C	0	C	0	C	0
9	F	0	F	0	F	0	F	0

Tulshibhavani Mahila Mandal's

Hanmuji Chandale College, Shelgaon (RL)

Tal. Rahuri, Dist. Solapur (Maharashtra) 413723

RESULT ANALYSIS 2023 -2024

DEPARTMENT OF COMPUTER SCIENCE

B.SC -II SEM- III & IV

SR.NO	NAME	PAPER V	GRADE	PAPER VI	GRADE	PAPER VII	GRADE	PAPER VIII	GRADE	Percentage %
1	Bhosale Vaishnavi Dipak	37	A+	39	A+	44	O	41	O	81.42 %
2	Dange Sandhya Ishwar	35	A+	42	O	43	O	33	A+	79.85 %
3	Kapase Samarth Kishor	29	B+	31	A+	33	A	32	A	68.17 %
4	Kurhade Mahesh Shankar	27	B	33	A	32	A	31	A	70.42 %
5	Madne Aditya Babasaheb	28	B+	33	A	33	A	32	A	67.42 %
6	More Dnyaneshwar Mahadev	35	A	35	A+	30	A	31	A	67.98 %
7	Navgude Ankush Tukaram	38	A+	44	O	44	O	42	O	85.57 %
8	Pande Samarth Sanjay	24	C+	6	F	33	F	28	F	32.71 %
9	Rode Vaishnavi Sanjay	33	A+	40	O	41	O	40	O	83.67 %
10	Sathe Onkar Tatoji	23	C	31	A	32	A	28	B+	66.83 %
11	Zendage Vishal Vitthal	25	B	32	A	28	B+	27	B	64.92 %
12	Gaikwad Akanksha Appasaheb	34	A	42	O	44	O	40	O	84.27 %

SUMMARY OF GIVEN PAPER OF COMPUTER SCIENCE

SR. NO.	PAPER V	TOTAL	PAPER VII	TOTAL	PAPER VIII	TOTAL	PAPER VIII	TOTAL
1	O+	0	O+	0	O+	0	O+	0
2	O	0	O	4	O	5	O	4
3	A+	4	A+	3	A+	0	A+	3
4	A	2	A	4	A	5	A	4
5	B+	2	B+	0	B+	2	B+	1
6	B	3	B	0	B	0	B	1
7	C+	3	C+	2	C+	0	C+	0
8	C	1	C	0	C	0	C	0
9	P	0	P	1	P	2	P	2

Tal. Sangole, Dist. Solapur (Maharashtra) 413307

Hutmaji Chandole College, Sholapur (R).

RESULT ANALYSIS 2023 -2024

DEPARTMENT OF COMPUTER SCIENCE

SSC Sem V

Sr. No	STUDENT NAME	PAPER XIII	GRADE	PAPER XIV	GRADE	PAPER XV	GRADE	PAPER XVI	GRADE
1	Bhosale Bhakti Jambuvant	56	B+	56	B+	58	B	58	B
2	Dhongale Om Pramod	57	B+	53	B	48	C+	58	B+
3	Lokhande Sakshi Madhukar	58	B+	52	B	54	B	58	B+
4	Mirkar Nikita Dnyaneshwar	58	B+	49	C+	52	B	58	B

SUMMARY OF GIVEN PAPER OF COMPUTER SCIENCE

Sr. No.	PAPER XIII	TOTAL	PAPER XIV	TOTAL	PAPER XV	TOTAL	PAPER XVI	TOTAL
1	O+	O	O+	O	O+	O	O+	O
2	O	O	O	O	O	O	O	O
3	A+	O	A+	B	A+	B	A+	B
4	A	B	A	B	A	B	A	B
5	B+	A	B+	A	B+	A	B+	A
6	B	B	B	B	B	B	B	B
7	C+	B	C+	A	C+	A	C+	B
8	C	B	C	B	C	B	C	B
9	F	C	F	C	F	C	F	C

Tuljabhavani Mahila Mandal's
Harmuji Chandele College, Shelgaon (R),
Tal. Barshi, Dist. Solapur (Maharashtra) 413223

RESULT ANALYSIS 2023-2024

DEPARTMENT OF COMPUTER SCIENCE

BSC-III SEM-VI

Sr. No.	STUDENT NAME	PAPER XIII	GRADE	PAPER XIV	GRADE	PAPER XV	GRADE	PAPER XVI	GRADE	Percentage %
1	Bhosale Bhakti Jambuvant	78	A+	78	A+	82	O	63	A	71.76%
2	Dhengale Om Pramod	75	A+	80	A+	86	A	63	A	74.01%
3	Lokhande Sakshi Madhukar	73	A+	74	A+	77	A+	57	B+	71.39%
4	Munde Nikita Dnyaneshwar	70	A+	78	A+	80	O	68	A	74.18%

SUMMARY OF GIVEN PAPER OF Computer Science

SR. NO.	PAPER XIII	TOTAL	PAPER XIV	TOTAL	PAPER XV	TOTAL	PAPER XVI	TOTAL
1	O+	0	O+	0	O+	0	O+	0
2	O	0	O	0	O	2	O	0
3	A+	3	A+	4	A+	1	A+	0
4	A	0	A	0	A	1	A	2
5	B+	0	B+	0	B+	0	B+	1
6	B	0	B	0	B	0	B	0
7	C+	0	C+	0	C+	0	C+	0
8	C	0	C	0	C	0	C	0
9	F	0	F	0	F	0	F	0

RESULT ANALYSIS 2023-2024 B.SC -I

DEPARMENT OF chemistry

SR.NO	STUDENT NAME	PAPER I	GRADE	PAPER II	GRADE	PAPER III	GRADE	PAPER IV	GRADE
1	More Bharati Ganesh	24	C+	32	A	23	A	32	A
2	MANE NIKITA TUKARAM	20	C	28	B+	23	C+	33	A
3	MOTE SWARANJALI RAMRAJE	29	B+	33	A	30	A	33	A
4	NIKAM ROHIT SANTOSH	24	C+	23	C	23	C+	25	B
5	Beg Saniya Nasim	42	O	31	A	31	A	80	O
6	SARVALE PUNAM PARSHURAM	30	A+	29	B	27	A	48	O
7	Chavan Ajay Balasaheb	21	C	29	B+	28	A+	35	A+
8	SATHE SANDIP DILIP	28	C+	30	C	32	A	34	A
9	Dalvi Nitin Santosh	31	A	28	C+	30	A+	27	B
10	Deshmukh samrudhi Sudhir	29	B+	30	A	26	A	32	A
11	Deshmukh Vikram vishwajeet	32	A	31	A	37	A+	35	A+
12	Gaje omkar umesh	26	C+	30	A	33	A+	31	A
13	Gore sneha Rajkumar	37	A+	34	A	36	A+	33	A
14	SATHE SUYESH UMAKANT	22	C	28	C	26	A	35	A+
15	Gund Dnyaneshwar Dinesh	29	C+	30	A	36	A+	32	A
16	GHADGE HARSHAD MURARAJI	37	B+	33	C	35	A+	42	O
17	Hande Mahadev Devidas	26	B	35	A	32	A	33	A
18	Jadhav Anisha Balasaheb	30	A+	31	A	27	B	34	A
19	Kadam Ram Dnyaneshwar	27	B	31	A	28	A+	36	A+

20	Kade Rajani Rajendra	24	A	33	A	37	A	37	A+
21	KAPSE RUHIKESH SAMPAT	24	C+	20	C	26	B	32	A
22	Karande Sakshi Suryakant	23	C+	31	A	32	A	37	A+
23	Lohar Gouri Mahadev	25	B	30	A	33	A	33	A
24	Mali Swapnil Sanjay	21	C	30	A	36	A+	41	O
25	MAGAR RUTUJA DHANAJI	21	C	26	B	31	A	37	A+
26	Mane Yash Janak	22	C	30	A	38	A+	32	A
27	More Bharati Ganesh	24	C+	31	A	38	A	32	A
28	More Om Shivalkumar	21	C	32	A	31	A	31	A
29	More Omkar vishwas	21	C	33	A	30	A	31	A
30	Nannaware Vaishnavi Dattatraya	28	B+	35	A+	37	A+	34	A
31	Nichal Sarika Sambhaji	27	B	35	A+	35	A+	32	A
32	Padharmise Maulin Ramesh	25	C+	25	B	29	B+	32	A
33	Patil Vaishnavi Sanjay	27	B	32	C	35	A+	44	O
34	Pawar Pragati Laxman	30	A	30	C	31	A	35	A+
35	Salunke Balakrishn Shrudas	23	C+	30	C	31	A	37	A+
36	Sarvale Rutuja Pushpraj	26	B	30	B	33	A	37	A+
37	KAMBALE AMRUTA GAUTAM	35	A+	30	A+	38	A+	38	A+
38	Sutar Sonive Dattatraya	31	A	0	F	5	F	5	F
39	AVHAD RODGE DATTATRAYA	32	A	29	B+	35	A+	43	O
40	JADHAV KRUSHNATH RAMCHANDRA	33	A	25	B	37	A+	34	A
41	DESALE RUTUJA RAMESHWAR	32	A	26	B	37	A+	31	A

Hemuji Chandele College, Shelgaon (R),

42	SHELAKE SWARANJALI VINAYAK	29	B+	32	C	38	A+	37	A
43	Waykar Sanket Vitthal	20	E	9	F	33	A	28	B+
44	Shinde Kiran Bharat	33	A	30	F	29	B+	33	A
45	Shaikh Sakhib Shaukat	32	A	9	F	34	A	38	A
46	DAVANE BALAJI ASHOK	30	C	27	B	36	A+	29	B+
47	Aware Dhiraj Ankushrao	28	B	30	A	34	A	35	A+
48	Dixit Akash Tanji	32	C	26	B	29	B+	31	A
49	Narnaware Priya Namdev	32	A	36	A+	32	A	33	A
50	CHAVAN MAYURI VILAS	30	A	32	A	38	A+	37	A+
51	Gavali Dhiraj Vinayak	24	C+	27	B	28	B+	32	A
52	AWARE SWATI MOHAN	35	A+	30	A	34	A	40	O
53	AWARE NISHA SUDHKAR	26	B	33	A	37	A+	38	A
54	SHIDE KIRAN BHARAT	33	A	35	F	29	B+	33	A
55	SOLUNDALE VIKAS BABASAHEB	33	A	F	F	37	A+	38	A

SUMMARY OF GIVEN PAPER OF chemistry

SR. NO.	PAPER I	TOTAL	PAPER II	TOTAL	PAPER III	TOTAL	PAPER IV	TOTAL
1	O+	0	O+	0	O+	0	O+	6
2	O	1	O	0	O	0	O	7
3	A+	5	A+	4	A+	21	A+	18
4	A	13	A	22	A	28	A	29
5	B+	5	B+	1	B+	4	B+	2
6	B	8	B	5	B	3	B	1
7	C+	11	C+	3	C+	2	C+	0
8	C	12	C	9	C	0	C	0
9	F	0	F	2	F	1	F	1

Principal
Hemuji Chandele College
Shelgaon(R), Tal-Barshi Dist-Solapur

Tuljabhavani Mahila Mandal's

Hemaji Chandele College, Shelgaon (R),

Tal. Barshi, Dist. Solapur (Maharashtra) 413223

RESULT ANALYSIS 2023-2024

DEPARTMENT OF MICROBIOLOGY

B.SC –I SEM- I & II

SR.NO	STUDENT NAME	PAPER I	GRADE	PAPER II	GRADE	PAPER III	GRADE	PAPER IV	GRADE
1	More Bharati Ganesh	33	A	28	B+	35	A	30	A
2	Beg Samiya Nasim	30	A+	33	A+	35	A+	32	A
3	Chavan Ajay Balasaheb	32	A	26	C+	26	B	25	B
4	Dalvi Nitin Santosh	21	C	22	C	25	C	21	C
5	Deshmukh Samruddhi Sudhir	29	B+	22	C	27	C	27	B
6	Deshmukh Vikrant vishwajeet	38	A+	30	A	29	B+	33	A
7	Gaite omkar umesh	21	C	24	C+	28	B	28	B
8	Gore sneha Rajkumar	29	A+	35	A	40	O	32	A
9	Gund Shyajee Dinesh	36	A+	28	B	29	B+	26	B
10	Hande Mahadev Devidas	32	A	28	B+	29	B+	30	A
11	Jadhav Amisha Balasaheb	37	A+	27	B	34	A	36	A+
12	Kadam Ram Dnyaneshwar	35	A+	27	B	30	A	36	A+
13	Kale Rajani Rajendra	41	O	37	A+	38	A+	35	A
14	Karande Sakshi Suryakant	35	A+	24	C+	30	A	32	A
15	Lohar Gouri Mahadev	30	A	28	B+	33	A	31	A
16	Mali Swatini Sanjay	38	A+	30	B	29	B+	28	B
17	Mane Yash Jalak	27	B	27	B	31	C	28	B+
18	More Om Shashikumar	23	C+	21	C	23	C	25	B
19	More Omkar vishwas	35	A+	29	B+	28	B+	30	A
20	Nanaware Vaishnavi Dattatrayo	42	O	31	A	33	A	31	A
21	Nichat Sarika Sambhaji	37	A+	31	A	30	A	33	A
22	Padhamnise Mayuri Ratnesh	38	A	29	B+	29	B+	32	A
23	Patil Vaishnavi Sanjay	35	A+	36	A+	32	A	35	A+
24	Pawar Pragati Laxman	34	A	28	B+	31	A	30	A
25	Salunke Rajeshwari Shivdas	34	A	30	A	32	A	32	A
26	Sarvale Ruturaj Pralhadrao	33	A	30	A	28	B+	30	A
27	Sutar Seema Dattatraya	25	B+	27	B	5	F	5	F
28	SHELAKE SWARANJALI VINAYAK	35	A+	33	A	35	A+	34	A
29	Waykar Sanket Vitthal	27	B	22	C	34	C+	26	B
30	Shinde Karan Bharat	26	B	32	A	29	B+	29	B+
31	Shaikh Sakhib Shaukat	21	C	4	F	25	C	29	B+
32	Awate Dhiraj Annasaheb	35	A	26	B+	26	B+	27	B
33	Dixit Akash Tanji	26	B	27	B	22	C	26	B

4	Nannaware Priya Namdev	38	A+	33	A	34	A	30	A
5	Gavali Dhiraj Vinayak	28	B+	24	C+	23	C+	23	C

SUMMARY OF GIVEN PAPER OF Microbiology

SR. NO.	PAPER I	TOTAL	PAPER II	TOTAL	PAPER III	TOTAL	PAPER IV	TOTAL
1	O+	0	O+	0	O+	0	O+	0
2	O	2	O	0	O	1	O	0
3	A+	14	A+	3	A+	3	A+	3
4	A	9	A	9	A	11	A	17
5	B+	2	B+	7	B+	3	B+	3
6	B	4	B	7	B	2	B	9
7	C+	1	C+	4	C+	2	C+	0
8	C	3	C	0	C	0	C	3
9	F	0	F	1	F	1	F	1

Head of the Department
Microbiology

Tulsibhavani Mahila Mandal's
Hemuji Chandole College, Shelpoor (M),
Tal. Barshi, Dist. Solapur (Maha.) 413403

RESULT ANALYSIS 2021-2024

DEPARTMENT OF Microbiology

B.SC-II SEM-III & IV

SR.NO	NAME	PAPER V	GRADE	PAPER VI	GRADE	PAPER VII	GRADE	PAPER VIII	GRADE
1	STUDENT ADSUL SAMRUDHI	42	O	37	A+	28	B+	31	A
2	ALAT NIKITA	41	O	32	A	33	A	32	A
3	BARBADE SAKSHI	37	A+	32	A	34	A	33	A
4	BHOSALE KOMAL	38	A|+	35	B+	33	A	25	B
5	BHOSALE SAKSHI	37	A+	35	A+	33	A	28	B+
6	BHOSALE SANGITA	33	A	34	A	29	B	31	A
7	BHADOLE NIKITA	30	A	27	B	29	B+	32	A
8	GHODAKE SANDHYA	32	A	31	A	34	A	30	A
9	KASHID SANIKA	33	A	28	B+	33	A	29	A
10	MANE PUNAM	25	B	27	B	30	C	33	C
11	MASAL NIRMALA	27	B	26	B	28	B+	28	B+
12	CHAVAN ANAND	28	B+	25	B	25	B	29	B+
13	PATIL VAISHNAVI	30	A	30	A	30	A	33	A
14	PATIL PRUTHVIRAJ	40	A	39	B+	29	B+	40	O
15	PAWAR AISHWARYA	33	A	38	A+	35	A+	35	A+
16	MASAL DHANAJI	28	B+	25	B	5	F	5	F
17	PATIL PRATIKSHA	30	A	25	B	33	A	42	O
18	PATIL SANDHYA	31	A	32	A	30	A	41	O
19	DALAVE ADITYA	29	B+	26	B	33	C+	28	B+
20	SAYHE ROHAN	28	B+	21	C	28	B+	33	A

Education is a lamp to guide the path of knowledge
Tuljabhavani Mahila Mandal's
Hemuji Chandele College, Shelgaon (R),
Tal. Barshi, Dist. Solapur (Maharashtra) 413222

SUMMARY OF GIVEN PAPER OF Microbiology

SR. NO.	PAPER V	TOTAL	PAPER VI	TOTAL	PAPER VII	TOTAL	PAPER VIII	TOTAL
1	O+	0	O+	0	O+	0	O+	0
2	O	2	O	9	O	6	O	3
3	A+	3	A+	4	A+	2	A+	1
4	A	9	A	8	A	9	A	9
5	B+	4	B+	2	B+	5	B+	6
6	B	2	B	1	B	2	B	3
7	C+	0	C+	0	C+	1	C+	0
8	C	0	C	1	C	1	C	1
9	F	0	F	0	F	1	F	3

Head of the Department
Microbiology

Tuljabhavani Shikshan Mandal's

Hemaji Chandale College, Shelgaon (R),

Tal: Barshi, Dist. Solapur (Maharashtra) 413403

RESULT ANALYSIS 2023 -2024

DEPARMENT OF MICROBIOLOGY

BSC-III SEM –V&VI

SR NO	STUDENT NAME	PAPER IX	GRADE	PAPER X	GRADE	PAPER XI	GRADE	PAPER XII	GRADE
1	Agalave Onkar Bharat	57	B+	40	C	52	B	46	C+
2	Garad Swapnil Dashrath	47	C+	52	B	38	C	50	B
3	Nikam Tushar Dadarao	55	B+	44	C	48	C	54	A
4	Raddi Abhishek Chandrakant	50	B	44	C	37	C	52	B
5	Londhe Somnath Vilas	50	B+	54	B	42	C	54	B
6	Kakade dhanashri kalidas	48	C+	46	C+	42	C	62	A
7	Salunkhe vaibhav vikas	52	B	45	C+	36	C	50	B

SUMMARY OF GIVEN PAPER OF MICROBIOLOGY

SR NO.	PAPER IX	TOTAL	PAPER X	TOTAL	PAPER XI	TOTAL	PAPER XII	TOTAL
1	O+	0	O+	0	O+	0	O+	0
2	O	0	O	0	O	0	O	0
3	A+	0	A+	0	A+	0	A+	0
4	A	0	A	0	A	0	A	0
5	B+	1	B+	0	B+	0	B+	0
6	B	2	B	2	B	1	B	4
7	C+	2	C+	2	C+	0	C+	1
8	C	0	C	3	C	4	C	0
9	F	0	F	0	F	0	F	0

Head of the Department
Microbiology

RESULT ANALYSIS 2023 -2024

Tuljabhavani Mahila Mandal's
Hemuji Chandele College, Shelgaon (R),
Tal. Barshi, Dist. Solapur (Maharashtra) 413202

RESULT ANALYSIS 2023-2024

DEPARMENT OF Microbiology

BSC-III SEM VI

SR NO	STUDENT NAME	PAPER XIII	GRADE	PAPER XIV	GRADE	PAPER XV	GRADE	PAPER XVI	GRADE
1	Agalave Onkar Bharat	57	B+	61	A	52	B	62	C
2	Garad Swapnil Dashrath	58	B	67	B+	57	B+	63	C
3	Nikam Tushar Dadarao	68	A	78	A+	78	A+	68	A
4	Reddi Abhishek Chandrakant	62	A	56	A	59	B+	46	C+
5	Londhe Somnath Vilas	62	A	48	A	65	A	49	C+
6	Kakade dharashiv Nandlal	73	A+	58	B+	68	A	42	C
7	Salunkhe vaibhav vikas	68	A	63	A	72	A+	48	C+

SUMMARY OF GIVEN PAPER OF MICROBIOLOGY

SR NO	PAPER XII	TOTAL	PAPER XIV	TOTAL	PAPER XV	TOTAL	PAPER XVI	TOTAL
1	O+	0	O+	0	O+	0	O+	0
2	O	0	O	0	O	0	O	0
3	A+	1	A+	1	A+	2	A+	0
4	A	4	A	4	A	3	A	1
5	B+	4	B+	2	B+	3	B+	0
6	B	1	B	0	B	1	B	0
7	C+	0	C+	0	C+	0	C+	1
8	C	0	C	0	C	0	C	1
9	F	0	F	0	F	0	F	0

Head of the Department
Microbiology

Hemaji Chandole College, Shelgaon (R).

DEPARTMENT OF MATHEMATICS

Mapping of Slow and Advanced Learners

SR NO	NAME OF STUDENT	CLASS	STATUS
1	Kapase Samarth Kishor	Bsc II	Advanced
2	Madre Aditya Babasaheb	Bsc II	slow
3	Sathe Onkar Tanaji	Bsc II	slow
4	Parade Samarth Sanjay	Bsc II	slow
5	Kurhade Mahesh Shankar	Bsc II	slow
6	More Omsameshwar Mahadev	Bsc II	slow
7	Zendage Vishal Vitthal	B Sc II	slow

Principal
Hemaji Chandole College

Head of the Department
Mathematics

DEPARTMENT OF MATHEMATICS

Mapping of Slow and Advanced Learners

SR NO	NAME OF STUDENT	CLASS	Status
1	Aware Nisha Sudhakar	Bsc I	Slow
2	Awate Swati Mohan	Bsc I	Advanced
3	Bhosale Rushikesh Deepak	Bsc I	Slow
4	Chavan Mayuri Vilas	Bsc I	Slow
5	Dalavi Anjali Bhausaheb	Bsc I	Slow
6	Dhiwane Balaji Ashok	Bsc I	Slow
7	Dhole Rutuja Rameshwar	Bsc I	Advanced
8	Jadhav Krushnath Ramchandra	Bsc I	Advanced
9	Jadhar Puja Dattatraya	Bsc I	Slow
10	Kadam Sayali Sharad	Bsc I	Slow
11	Kade Om Shankar	Bsc I	Slow
12	Kamble Ankita Gautam	Bsc I	Advanced
13	Kanase Rushikesh Sangat	Bsc I	Slow
14	Kausar Vaishnavi Vikas	Bsc I	Advanced
15	Magar Rutuja Dhanaji	Bsc I	Slow
16	More Nikita Tukaram	Bsc I	Advanced
17	Metage Prajakta Satyawan	Bsc I	Slow
18	Mote Sarang Vishnu	Bsc I	Slow
19	Mote Sunil Lakshman	Bsc I	Slow
20	Mote Swaranjali Ramdas	Bsc I	Advanced
21	Nikam Rohit Santosh	Bsc I	Slow
22	Saraswati Puram Parshuram	Bsc I	Advanced
23	Sathe Sandip Dilip	Bsc I	Slow
24	Sathe Sujeet Shahaji	Bsc I	Advanced
25	Shaikh Simran Mubarak	Bsc I	Advanced
26	Soundale Vikas Babasaheb	Bsc I	advanced

Principal
Hemaji Chandak College
Shelgaon (R)

Head of the Department
Mathematics

SLOW AND ADVANCE LEARNER 2023-24

SR.NO	STUDENTS NAME	CLASS	STATUS	PERCENTAGE	
1	More Bharati Ganesh	B.Sc. I	ADVANCED	67.50%	
2	Beg Sariya Nasim	B.Sc. I	ADVANCED	78.50%	1
3	Chavan Ajay Balasaheb	B.Sc. I	ADVANCED	65.08%	
4	Dalvi Nitin Santosh	B.Sc. I	SLOW	58.33%	
5	Deshmukh Samrudhi Sudhir	B.Sc. I	ADVANCED	65%	
6	Deshmukh Vikram Vishwajeet	B.Sc. I	ADVANCED	70.50%	
7	Gate Omkar Umesh	B.Sc. I	ADVANCED	64.33%	
8	Gole Sneha Rajkumar	B.Sc. I	ADVANCED	77.33%	2
9	Gund Shyamli Dinesh	B.Sc. I	ADVANCED	65.17%	
10	Hanjle Mahadev Devidas	B.Sc. I	ADVANCED	64.75%	
11	Jadhav Anisha Balasaheb	B.Sc. I	ADVANCED	73.83%	5
12	Kadam Ram Dnyaneshwar	B.Sc. I	ADVANCED	70.58%	
13	Kale Rajani Rajendra	B.Sc. I	ADVANCED	77%	3
14	Kamble Siddhi Suryakant	B.Sc. I	ADVANCED	69%	
15	Lohar Gauri Mahadev	B.Sc. I	ADVANCED	70.25%	
16	Mali Swapnil Sanjay	B.Sc. I	SLOW	54%	
17	More Yash Janak	B.Sc. I	SLOW	50.50%	
18	More Om Shivkumar	B.Sc. I	SLOW	57.08%	
19	More Omkar Vijithray	B.Sc. I	ADVANCED	65.50%	
20	Narnaware Vaishnavi Dattatraya	B.Sc. I	ADVANCED	70.58%	
21	Nijhal Taisha Santosh	B.Sc. I	ADVANCED	71.83%	
22	Padhurmise Mayuri Ramesh	B.Sc. I	ADVANCED	68.67%	
23	Patil Vaishnavi Sanjay	B.Sc. I	ADVANCED	77.67%	
24	Pawar Pragati Laxman	B.Sc. I	ADVANCED	68.42%	
25	Salunke Rajeshwari Shivdas	B.Sc. I	ADVANCED	69.42%	
26	Sarvale Rutuja Pushuram	B.Sc. I	ADVANCED	65.75%	
27	Sutar Soniya Dattatraya	B.Sc. I	SLOW	46.67%	
28	Shelake Swaranjali Vinayak	B.Sc. I	ADVANCED	76.58%	4
29	Waykar Sanket Vitthal	B.Sc. I	ADVANCED	60.17%	
30	Shinde Kiran Bharat	B.Sc. I	ADVANCED	67.50%	
31	Shaikh Sakhib Shaukat	B.Sc. I	SLOW	51.33%	
32	Awate Dhiraj Annasaheb	B.Sc. I	ADVANCED	67.25%	
33	Dixit Akash Tanaji	B.Sc. I	SLOW	59.08%	
34	Nannaware Priya Namdev	B.Sc. I	ADVANCED	70.58%	
35	Gavali Dhiraj Vinayak	B.Sc. I	ADVANCED	66.22%	

DEPARTMENT OF MICROBIOLOGY

SLOW AND ADVANCE LERNER 2023-24

SR.NO	NAME OF STUDENTS	CLASS	STATUS	PERCENTAGE	
1	ADSUL SAMRUDHI	B.SC -II	ADVANCED	76.42%	
2	ALAT NIKITA	B.SC -II	ADVANCED	81.33%	3
3	BARBADE SAKSHI	B.SC -II	ADVANCED	85.00%	2
4	BHOSALE KOMAL	B.SC -II	ADVANCED	79.83%	
5	BHOSALE SAKSHI	B.SC -II	ADVANCED	80.83%	5
6	BHOSALE SANKITA	B.SC -II	ADVANCED	79.17%	
7	BHADOLE NIKITA	B.SC -II	ADVANCED	78.92%	
8	GHODAKE SANDHYA	B.SC -II	ADVANCED	81.17%	4
9	KASHID SANIKA	B.SC -II	ADVANCED	77.67%	
10	MANE PUNAM	B.SC -II	ADVANCED	68.92%	
11	MASAL NIRMALA	B.SC -II	SLOW	38.50%	
12	CHAVAN ANAND	B.SC -II	ADVANCED	69.42%	
13	PATIL VAISHNAVI	B.SC -II	ADVANCED	78.33%	
14	PATIL PRUTHVIRAJ	B.SC -II	ADVANCED	72.25%	
15	PAWAR AISHWARYA	B.SC -II	ADVANCED	87.00%	1
16	MASAL DHANAJI	B.SC -II	SLOW	42.92%	
17	PATIL PRATIKSHA	B.SC -II	ADVANCED	75.67%	
18	PATIL SANDHYA	B.SC -II	ADVANCED	74.25%	
19	DALAVE ADITYA	B.SC -II	SLOW	53.33%	
20	SATHE ROHAN	B.SC -II	ADVANCED	65.08 %	

DEPARMENT OF MICROBIOLOGY

SLOW AND ADVANCE LERNER 2023-24

SR.NO	STUDENTS NAME	CLASS	STATUS	PERCENTAGE
1	Agalave onkar bharat	B.Sc. III	SLOW	53.88 %
2	Garad swapnil dashrath	B.Sc. III	SLOW	59.55 %
3	Nikam tushar dattarao	B.Sc. III	ADVANCED	70.45 %
4	Wadgi abhishek chandrakant	B.Sc. III	ADVANCED	62.36 %
5	Londhe somnath vilas	B.Sc. III	ADVANCED	64.70 %
6	Kokade dhanashri kalidas	B.Sc. III	ADVANCED	60.68 %
7	Salunkhe vaibhav vikas	B.Sc. III	ADVANCED	66.09 %

Hemuji chandelle college shelgaon (R)

SR NO	NAME OF STUDENT	CLASS	
	ADVANCED LEARNER		
1	More Bharati Ganesh	Bsc I	Absence
2	Awate Gauri Panurang	Bsc I	
3	Baraskar srushti Gorakh	Bsc I	
4	Barbole Gayatri Gopal	Bsc I	
5	Beg Saniya Nasim	Bsc I	
6	Chaudhari Monali Devidas	Bsc I	
7	Chavan Ajay Balasaheb	Bsc I	
8	Chorghe Suraj Baburaoheb	Bsc I	Absent
9	Dalvi Nitin Santosh	Bsc I	
10	Deshmukh samrudhi sudhir	Bsc I	
11	Deshmukh Vikrant vishwajeet	Bsc I	
12	Gate omkar umesh	Bsc I	
13	Gore sneha Rajkumar	Bsc I	
14	Gund Priti Balasaheb	Bsc I	
15	Gund Shyajeet Dinesh	Bsc I	
16	Gupta Ronak Yogesh	Bsc I	
17	Handal Mahadev Devidas	Bsc I	
18	Jadhav Anisha Balasaheb	Bsc I	Absence
19	Kadam Ram Dnyaneshwar	Bsc I	
20	Kade Rajan Rajendra	Bsc I	
21	Kumbhar Rohan vishwanath	Bsc I	
22	Karande Sakshi Sureshrao	Bsc I	
23	Lohar Gauri Mahadev	Bsc I	
24	Mali Swapnil Sanjay	Bsc I	
25	Mane Tanuja Kumar	Bsc I	
26	Mane Yash Janak	Bsc I	
27	More Bhairavi Ganesh	Bsc I	
28	More Om Shitalkumar	Bsc I	
29	More Omkar vishwas	Bsc I	
30	Nahrawane Vaishnavi Damodhar	Bsc I	
31	Nechal Sarika Sambhaji	Bsc I	
32	Pachpinde Mayuri Ramesh	Bsc I	
33	Patil Onkar Anil	Bsc I	
34	Patil Vaishnavi Sanjay	Bsc I	
35	Pawar Pragati Laxman	Bsc I	
36	Sakunde Rajeshwari Gautam	Bsc I	
37	Sarkale Ashok Pushpram	Bsc I	

Head of the Department
Zoology

Principal
Hemuji Chandele College
Shelgaon, Tal-Basmat, Dist-Hingoli

Hemuji chandelle college shelgaon (R)

28	Shelake Samiksha Vinayak	Bsc I	
29	Sutar Somya Dattatraya	Bsc I	
30	Shinde Ravi Kedari	Bsc I	
	Slow learner	Bsc I	
1	Vaykar Sanket Vitthal	Class	
2	Shinde Kiran Bharat	Bsc I	
3	Shaikh Sakhib Shaukat	Bsc I	
4	Ravanguna Pushkar Popat	Bsc I	
5	Awate Dhiraj Ahmadsaheb	Bsc I	
6	Shirt Akash Tanji	Bsc I	
7	Ramawate Priya Namdev	Bsc I	
8	Madne Ranjit Kailas	Bsc I	
9	Gavali Dhiraj Vinayak	Bsc I	
10	Gaiki Mahadev Devidas	Bsc I	
11	Lake Harshad Bharat	Bsc I	
12		Bsc I	

Head of the Department
Zoology

Hemuji Chandelle College
Shelgaon Tal.Karmala Dist.Solapur

DEPARTMENT OF PHYSICS

Mapping of Slow and Advanced Learners

SR NO	NAME OF STUDENT	CLASS	Status
1	Aware Nisha Sudhakar	Bsc I	Slow
2	Aware Swati Mohan	Bsc I	Advanced
3	Bhosale Rushikesh Deepak	Bsc I	Slow
4	Chavan Mayuri Vilas	Bsc I	Slow
5	Dalavi Anjali Bhausaheb	Bsc I	Slow
6	Dhavane Balaji Ashok	Bsc I	Slow
7	Disale Rutuja Rameshwar	Bsc I	Advanced
8	Jadhav Krushnath Ramchandra	Bsc I	Advanced
9	Jadkar Puja Dattatraya	Bsc I	Slow
10	Kadam Sayali Sharad	Bsc I	Slow
11	Kade Om Shankar	Bsc I	Slow
12	Kamble Amruta Gautam	Bsc I	Advanced
13	Kapase Rushikesh Sampat	Bsc I	Slow
14	Kapase Vaishnavi Vikas	Bsc I	Advanced
15	Magar Rutuja Dhanaji	Bsc I	Slow
16	Mane Nikita Tukaram	Bsc I	Advanced
17	Melage Prajakta Satyawan	Bsc I	Slow
18	Mote Sarang Vithoo	Bsc I	Slow
19	Mote Sunil Lakshman	Bsc I	Slow
20	Mote Swaranjali Ramraje	Bsc I	Advanced
21	Nikam Rohit Santosh	Bsc I	Slow
22	Sarawale Punam Parshuram	Bsc I	Advanced
23	Sathe Sanjog Dilip	Bsc I	Slow
24	Sathe Sayash Shahaji	Bsc I	Advanced
25	Shaikh Simran Mubarak	Bsc I	Advanced
26	Sourdale Vikas Babasaheb	Bsc I	advanced

Head of the Department
Physics

Principal
Hemaji Chandele College
Shelgaon(K) Tal-Barshi Dist-Solapur

DEPARTMENT OF PHYSICS

Mapping of Slow and Advanced Learners

SR NO	NAME OF STUDENT	CLASS	STATUS
1	Gaikwad Akanksha Appasaheb	Bsc II	Advanced
2	Navgude Anjali Yukaram	Bsc II	Advanced
3	Dange Sandhya Ishwar	Bsc II	Advanced
4	Bode Vaishnavi Sanjerao	Bsc II	Advanced
5	Bhosale Vaishnavi Deepak	Bsc II	slow
6	Kapase Samarth Kishor	Bsc II	Advanced
7	Madne Aditya Babusaheb	Bsc II	slow
8	Sathe Onkar Tanaji	Bsc II	slow
9	Parade Samarth Sanjay	Bsc II	slow
10	Kurhade Mahesh Shankar	Bsc II	slow
11	More Dnyaneshwar Mahadev	Bsc II	slow

Head of the Department

Principal
Hemaji Chandele College
Shelgaon (K) Tal-Barshi Dist-Solapur

Tajabhivani Mahila Mandal's

Hemuji Chandele College, Shelgaon (R).

Tal. Barshi, Dist. Solapur (Maharashtra) 413223

Department of chemistry

SR NO	NAME OF STUDENT	CLASS	STATUS
1	More Bharati Ganesh	fyc i	Advanced
2	Aware Gauri Pandurang	fyc i	Advanced
3	srushti Gorakh	fyc i	Advanced
4	Barbole Gayatri Gopal	fyc i	Slow
5	Beg Saniya Nasim	fyc i	Advanced
6	Chaudhari Monali Devidas	fyc i	Slow
7	Chavan Ajay Balasaheb	fyc i	Slow
8	Chorghe Suraj Balasaheb	fyc i	Slow
9	Dalvi Nitin Santosh	fyc i	Slow
10	Deshmukh samruddhi Sudhir	fyc i	Advanced
11	Deshmukh Vikrant vishwajeet	fyc i	Advanced
12	Gate omkar umesh	fyc i	Advanced
13	Gote sneha Rajkumar	fyc i	Advanced
14	Gund Pari Balasaheb	fyc i	Slow
15	Gund Shagun Dinesh	fyc i	Advanced

Principal
Hemuji Chandele College
Shelgaon(R) Tal-Barshi Dist-Solapur

DEPARTMENT OF CHEMISTRY 2023-24

SR NO	NAME OF STUDENT	CLASS	STATUS
1	ADSUL SAMRUDHI	B.SC -II	ADVANCED
2	ALAT NIKITA	B.SC -II	ADVANCED
3	BARBADE SAKSHI	B.SC -II	SLOW
4	BHOSALE KOMAL	B.SC -II	ADVANCED
5	BHOSALE SAKSHI	B.SC -II	ADVANCED
6	BHOSALE SANKITA	B.SC -II	ADVANCED
7	BHOSALE VAISHNAVI	B.SC -II	ADVANCED
8	DHANGE GANESHYA	B.SC -II	ADVANCED
9	MAVHALDE ANJALI	B.SC -II	ADVANCED
10	SADHID SADIKA	B.SC -II	ADVANCED
11	SHANE PURNIMA	B.SC -II	SLOW
12	GAIKWAD AKANSHA	B.SC -II	ADVANCED
13	AGRE VAISHNAVI	B.SC -II	ADVANCED
14	CHAVAN ANAND	B.SC -II	SLOW
15	PATIL VAISHNAVI	B.SC -II	ADVANCED
16	PATIL PRUTHVIRAJ	B.SC -II	ADVANCED
17	SIRSAT RUTUJA	B.SC -II	ADVANCED
20	GHORADE TRUPTI	B.SC -II	SLOW
21	PATIL PRATIKSHA	B.SC -II	ADVANCED
22	PATIL SANDHYA	B.SC -II	ADVANCED
23	DALAVI ADITYA	B.SC -II	ADVANCED
24	CHAVAN ARJUNA	B.SC -II	SLOW
25	JENDALE VISHAL	B.SC -II	SLOW

PRINCIPAL
Hemraj Chandele College Shelgaon (BK)
Tal-Barshi, Dist. Solapur

DEPARTMENT OF CHEMISTRY 2023-24

SR NO	NAME OF STUDENT	CLASS	STATUS
1	Atar Tamanna Sharan	BSC III	ADVANCED
2	Awate Pranali Maharudra	BSC III	ADVANCED
3	Awate Samarth Pandurang	BSC III	ADVANCED
4	Awate Suhag Ramhari	BSC III	ADVANCED
5	Chaudhari Ajay Balasaheb	BSC III	ADVANCED
6	Chavan Pankaj Raju	BSC III	SLOW
7	Chavan Rohit Prakash	BSC III	ADVANCED
8	Dewkar Rani Angad	BSC III	ADVANCED
9	Dhage Vishnu Arjun	BSC III	SLOW
10	Dige Rutuja Balasaheb	BSC III	ADVANCED
11	Jadhav Kirti Shankar	BSC III	ADVANCED
12	Jagtap Pritam Umesh	BSC III	ADVANCED
13	Kamble Swapnil Vitthal	BSC III	ADVANCED
14	Kamble Snehal Arun	BSC III	SLOW
15	Kapase Ajinkya Anil	BSC III	ADVANCED
16	Kapase Tejaswini Sampat	BSC III	ADVANCED
17	Kathar Renuka Ramling	BSC III	ADVANCED
18	Khot Pratiksha Kumar	BSC III	SLOW
19	Mohite Rajesh Satish	BSC III	ADVANCED
20	Raut Ankita Ravi	BSC III	ADVANCED
21	Shinde Devanand Rajendra	BSC III	ADVANCED
22	SHRIKHANT PRAMITA PAVAN	BSC III	SLOW
23	GUND Shubham MALLIKARJUN	BSC III	ADVANCED

PRINCIPAL
Hemaji Chandale College, Shelgaon (R)
Tal-Barshi, Dist Solapur

DEPARTMENT OF COMPUTER SCIENCE

Mapping of Slow and Advanced Learners

SR NO	NAME OF STUDENT	CLASS	Status
1	Aware Nisha Sudhakar	Bsc I	Slow
2	Aware Swati Mohan	Bsc I	Advanced
3	Bhosale Rushikesh Deepak	Bsc I	Slow
4	Chavan Mayuri Vilas	Bsc I	Slow
5	Dalavi Anjali Bhausaheb	Bsc I	Slow
6	Dhavane Balaji Ashok	Bsc I	Slow
7	Dhale Rutuja Rameshwar	Bsc I	Advanced
8	Jadhav Krushnath Ramchandra	Bsc I	Advanced
9	Jadkar Puja Dattatraya	Bsc I	Slow
10	Kadam Sayali Bharat	Bsc I	Slow
11	Kale Om Shankar	Bsc I	Slow
12	Kamble Amruta Gautam	Bsc I	Advanced
13	Kapase Rushikesh Tampati	Bsc I	Slow
14	Kapase Vaishnavi Vilas	Bsc I	Advanced
15	Magar Rutuja Dhanaji	Bsc I	Slow
16	Mane Nikita Tukaram	Bsc I	Advanced
17	Molage Prajakta Satyavan	Bsc I	Slow
18	Mote Sarang Vishnu	Bsc I	Slow
19	Mote Sunil Lakshman	Bsc I	Slow
20	Mote Swaranjali Ramraje	Bsc I	Advanced
21	Nikam Rohit Santosh	Bsc I	Slow
22	Sarawale Punam Parshuram	Bsc I	Advanced
23	Sathe Sandip Dilip	Bsc I	Slow
24	Sathe Suyash Shahaji	Bsc I	Advanced
25	Shaikh Simran Mubarak	Bsc I	Advanced
26	Soundale Vikas Babasaheb	Bsc I	advanced

Head of the Department
Computer Science

Principal
Hemaji Chandele College
Shelgaon(R), Tal-Barshi Dist-Solapur

DEPARTMENT OF COMPUTER SCIENCE

Mapping of Slow and Advanced Learners

SR NO	NAME OF STUDENT	CLASS	STATUS
1	Gaikwad Akanksha Appasaheb	Bsc II	Advanced
2	Mavgude Anjali Tukaram	Bsc II	Advanced
3	Dange Sandhya Ishwar	Bsc II	Advanced
4	Rode Vaishnavi Satjerao	Bsc II	Advanced
5	Bhosale Vaishnavi Deepak	Bsc II	slow
6	Kapase Samarth Kishor	Bsc II	Advanced
7	Madne Aditya Babasaheb	Bsc II	slow
8	Sathe Onkar Tanaji	Bsc II	slow
9	Parade Samarth Sanjay	Bsc II	slow
10	Kurhade Mahesh Shankar	Bsc II	slow
11	More Dnyaneshwar Mahadev	Bsc II	slow
12	Zendage Vishal Vitthal	B.Sc II	slow

Head of the Department
Computer Science

Principal
Hemaji Chandele College
Shelgaon, Tal-Barshi Dist-Solapur

"Education is a ladder to gather fruits of knowledge"

Tuljabhavani Mahila Mandal's

Hanuji Chandole College, Shelgaon (R),

Tal. Barshi, Dist. Solapur (Maharashtra) 413321

NOTICE

DATE

All the students hereby informed to attended the first meeting of mentor--mentee on Saturday 26 ugest 2023 at 9.00 am at science as per list enclosed here with if you have doubts do contact mentor

Miss . Dindore P.A.

MOBILE NO 9284492065

NAME OF MENTOR :MISS .DINDORE P.A. DEPT OF PHYSICS

LIST OF STUDENTS ALLOWED AS MENTEE

CLASS	STUDENT FULL NAME	MOBILE NO	SIGNATURE
B.SC I	Saundale Vikas Babasaheb	9112834778	
B.SC I	Nikam Rohit Santosh	9021191116	
B.SC I	Sathe Sandip Dilip	8579408945	
B.SC II	Navgude Anjali Tukaram	9689655808	
B.SC II	Rode Vaishnavi Satpirao	8767790056	
B.SC II	Bhosale Vaishnavi Dipak	7744019064	
B.SC II	Gaikwad Akanksha Ashoknrao	8805422300	
B.SC II	Dange Sandhya Ishwar	9822780537	
B.SC II	Kapase Samarth Kishor	9022707814	
B.SC II	Madre Aditya Babasaheb	7709885810	
B.SC II	Kurhade Mahesh Shankar	9529296573	
B.SC II	More Omprakshwar Mahadev	8767712141	
B.SC II	Parade Samarth Sanjay	9359083316	
B.SC II	Sathe Onkar Tanaji	9011514090	
B.SC II	Zendage Vishal Vitthal	9356796141	

Head of the Department
Physics

"Education is a ladder to gather from of knowledge"

Tuljabhavani Mahila Mandal's

Hemaji Chandole College, Shelgaon (R),

Tal. Barshi, Dist. Solapur (Maharashtra) 413223

NOTICE

DATE

All the students hereby informed to attended the first meeting of mentor –mentee on Saturday 24 august 2019 at 9.00 am at science as per list enclosed here with if you have doubts do contact mentor

Miss N.D JADHAV MOBILE NO 8007547334 College no 8999795493

NAME OF MENTOR MISS JADHAV N. D DEPT OF CHEMISTRY

LIST OF STUDENTS ALLOWED AS MENTEE

CLASS	STUDENT FULL NAME	MOBILE NO	SIGNATURE
B.SC III	JAGTAP PRITAM UMESH	8793186493	
B.SC III	KANADE VAISHALI ARUN	9999840770	
B.SC III	KAPSE AJINKYA ANIL	8262895782	
B.SC III	KAPSE TEJASHWINI SAMPAT	9665477588	
B.SC III	KATKAR RENUKA RAMLING	9284759289	
B.SC III	KHALI PRATIKSHA KUMAR	8767221882	
B.SC III	MOHITE RAGINI SATISH	8767182968	
B.SC III	RAUT ANKITA IYAN	9604127906	
B.SC III	SHERIKANE PRANITA PRABAN	8767263679	
B.SC III	SHIRAHANE SARASWATI SUNIL	8605941966	
B.SC III	SHINDE DIVYARANI RAJENDRA	7875985216	
B.SC III	SUNE SHUBHAM	7218008723	

Hemaji Chandole College Shelgaon (R)
Tal-Barshi, Dist-Solapur
Principal sign

Mentor

Miss Jadhav .N. D

Hemaji Chandak College, Shelgaon (R).

Notice

Date

All the students hereby informed to attend the first meeting of Mentor – Mentee on Saturday 26 August, 2023 at 9.00 am as Mentor section as per list enclosed here with. If you have doubts do contact Mentor, Miss. Bachute R.S Mobile no. 8999171133

College no. 09919649

Name of Mentor: Miss Bachute R.S.

Department of CHEMISTRY

List of student allotted as Mentee

Sr no	CLASS	STUDENT FULL NAME	MOBILE NO	SIGNATURE
1	B.SC III	Atar tamanna sharan	9881860528	
2	B.SC III	Aware pranali maharudra	7219181206	
3	B.SC III	Aware Samarth pandurang	7823851649	
4	B.SC III	Aware suhag ramhari	7517573644	
5	B.SC III	Choudhari ajay jitendra	8308247216	
6	B.SC III	Chavan pankaj balu	7821934442	
7	B.SC III	Chavan rohit prakash	9359187399	
8	B.SC III	Devkar rani angad	9322743230	
9	B.SC III	Dhage Vishnu arun	9604240108	
10	B.SC III	Dige ranuja balasaheb	9763758465	
11	B.SC III	Gund aadesh sunil	8805492197	
12	B.SC III	Jadhav kirti shanker	9689655470	
13	B.SC III	Kambale swapnil vitthal	8275440	

Principal sign

Mentor

Miss. bachute R.S.

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Tuljabhavani Mahila Mandal's
Hemuji Chandele College, Shelgaon (B).
Tal. Barshi, Dist. Solapur (Maharashtra) 413202

Notice

Date-

All the students hereby informed to attend the first meeting of Mentor – Mentee on Saturday ,26 August, 2023 at 9.00 am in science section as per list enclosed here with.

If you have doubts do contact Mentor, Miss. Sonawane J.R. Mobile no. 8090891792

College no. 8999796493

Sr. No.	Name of students	Mobile No.	Sign.
1	Mayke Nikita Dnyaneshwar	9527894826	Mayke N D
2	Bhosale Bhakti Sambhavant	8767452310	Bhosale
3	Lokhande Sakshi Madhukar	9673154299	Lokhande
4	Dhengale Om Pramod	9307430542	Dhengale
5	Dongare Dattatray Shobadev	8010643589	Dongare
6	Mote Sarang Vishnu	8669665190	S V Mote
7	Mote Sunil Laxman	9325801669	Mote S.L.
8	Kale Om Sharad	7499299799	Kale
9	Magar Rutuja Dharmaji	7756920883	Magar
10	Mane Nikita Tukaram	9158094817	N.T. Mane
11	Sathe Sagar Shivaji	8975495943	Sathe S.S.
12	Jadhav Krushnai Ramchandra	9359847282	Jadhav K.R.
13	Kapase Rushikesh Sampat	7264890469	

Hemuji Chandele College, Shelgaon (B)

Principal
Hemuji Chandele College
Tuljabhavani Mahila Mandal's

Tuljabhavani Mahila Mandal's
Hirabai Chandale College, Shelgaon (R),
Tal. Bhudgaon, Dist. Solapur (Maharashtra) 413222

Notice

Date:

All the students hereby informed to attend the first meeting of Mentor – Mentee on Saturday ,26 August, 2023 at 9.00 am at science section as per list enclosed here with. If you have doubts do contact Mentor, Miss. Gavali A. A. Mobile no. 8329317182

College no. 8999786451

Name of Mentor: Miss Gavali A. A.

Department of Microbiology

List of student allotted as Mentee

Sr.no.	Student name	Phone no.	Sign
1	Beg Samiya Nasim	9850657152	Samiya
2	Gore Sneha Rajkumar	8698738375	Gore
3	Kade Rajani Rajendra	9623232519	kade R.R.
4	Karande Sakshi Suryakant	7887692142	Skarande
5	Lohar Gouri Mahadev	9623353500	G. M. Lohar
6	Nichal Sanika Sambhaji	7387507134	N. S. N.
7	Pandharmise Mayuri Ramesh	7276166184	Pandharmise M.R.
8	Patil Vaishnavi Sanjay	9307123133	Patil V.S.
9	Shelake Swranjali Vinayak	7798199947	S.S.V.
10	Salunke Rajeshwari Shivdas	9922146364	Salunke R.S.

Gavali A A

Principal
Hirabai Chandale College
Shelgaon (R) Tal. Karmala Dist. Solapur

Tilaknagar Mahila Mandal's
Hemoji Chandele College, Shrigonda (M.S.)
Tal. Shrigonda, Dist. Solapur (Maharashtra) 413707

Notice

Date-

All the students hereby informed to attend the first meeting of Mentor – Mentee on Saturday ,26 August, 2023 at 9.00 am at science section as per list enclosed here with. If you have doubts do contact Mentor, Miss. Urade P.N. Mobile no. 9860220140

College no. 9999758493

Name of Mentor: Miss Urade P.N.

Department of Microbiology

List of student allotted as Mentee

Sr.no.	Student name	Phone no.	Sign
1	Aware Gauri Panurang	9503258O1	G. P. Aware
2	Barushar Srushti Gorakh	9673263419	S. G. Barushar Asst Teacher
3	Barbole Gayatri Gopal	9359673179	Gayatri B.
4	Chaudhari Monali Devidas	7083257061	Monali D. C. Asst Teacher
5	Deshmukh Samruddhi Sudhir	8788148572	S. S. Deshmukh
6	Gund Priti Balasaheb	7559497415	Gund P.
7	Jadhav Anisha Balasaheb	9881972975	J. A. B.
8	Mali swapnali sanjay	8308212458	S. S. Mali
9	Mane tanuja kumar	8265016215	Mane T. K.
10	More bharati ganesh	8468938405	M. B. G.
11	Nannaware priya namdev	9834043340	Priya N. N.
12	Nannaware vaishnavi dattatray	9970780436	V. D. N.
13	pawar pragati laxman	9172695704	Pawar P.
14	Shelake Samiksha Suresh	9322396557	– Asst Teacher
15	Shinde Kiran Bharat	8308930993	Kiran
16	Sutar Soniya Dattatraya	9356905669	Sutar S.

Principal
Hemoji Chandele College
Shrigonda, Tal. Karjat, Dist. Ahmednagar

Joint Principal
Hemoji Chandele College
Shrigonda, Tal. Karjat, Dist. Ahmednagar

Department Of Computer Science(2023-24)

Teaching Plan

Class- B.Sc. I

Semester – I

Subject – Computer Science

Paper – I Fundamentals of Computers

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	Introduction to computers, Evolution of personal computers.	1-8-23	9	Lecture
Day 2	Generation of computers, Elements of a computer	2-8-23	10	Lecture
Day 3	processing system- Hardware & Software, various categories of software, Computer organization Overview	3-8-23	9	Lecture
Day 4	CPU, I/O devices, storage devices and media, Various type of displays and other peripherals used in PCs	4-8-23	10	Lecture
Day 5	Unit Test	5-8-23	12	Quiz
Day 6	Introduction to Operating system, Purpose of Operating Systems, services and features of OS, Types of	7-8-23	8	ICT
Day 7	Operating System, Components of OS	8-8-23	11	Lecture
Day 8	Introduction to PC Operating Systems - DOS, Windows operating system, Unix/Linux operating system, Concept	9-8-23	11	Lecture
Day 9	and working with files and folders	10-8-23	12	Quiz
Day 10	Introduction to Mobile Operating System - Android, Windows, iOS, Symbian	11-8-23	13	Lecture
Day 11	Introduction to Green IT- Environmental Impacts of IT, Holistic Approach to Greening IT, Green IT Standards	12-8-23	13	ICT
Day 12	and Eco Labelling, Enterprise Green IT Strategy, Green IT: Burden or Opportunity?	14-8-23	11	ICT
Day 13	Hardware Life Cycle of a Device as Hardware, Issue, Disposal of Device	16-8-23	10	ICT

Principal
Hemaji Chandele College Shelgaon (R)
Tal-Barshi, Dist-Solapur

Day 14	Software: Introduction, Energy Saving Software Techniques, Evaluating and Measuring Software Impact	22-8-23	9	Lecture
Day 15	to Platform Power.	23-8-23	10	Lecture
Day 16	**MCQ Test**	24-8-23	10	Writing
Day 17	**Microsoft Word:** -Introduction to MS Word, opening, creating, saving, deleting document, page setting,	25-8-23	11	ICT
Day 18	formatting page, formatting text, adding images, Headerfooter,u borders and shading, bullets, mail merge, Table,	26-8-23	12	Lecture
Day 19	graphics, label, Templates, Wizards and Printing Techniques,	28-8-23	13	Experimental
Day 20	**Microsoft Excel:** -Introduction to excel, File management in excel, operations related to workbook, formatting	29-8-23	14	ICT
Day 21	sheet, adding formulas and functions, charts and maps,data menu, view menu,	1-9-23	11	Experimental
Day 22	work with multiple worksheets importing and exporting of data.	2-9-23	10	Experimental
Day 23	**Microsoft PowerPoint:** Introduction and Applications of Power Point, create a NewPresentation,	4-9-23	9	ICT
Day 24	Adding Slides Clip Arts, Smart art,	5-9-23	8	Experimental
Day 25	Charts, Text, images and otherobjects,	6-9-23	7	ICT
Day 26	Templates and Master Slides, Giving Animation	8-9-23	10	Experimental
Day 27	effects, Links and Actionbuttons	11-9-23	11	Practical
Day 28	Revision	12-9-23	12	Lecture

Signature of HOD

SIGN OF HOD

Hemul Chandola College Dhalgaon

Dhalgaon Dist.

SIGNATURE OF PRINCIPAL

PRINCIPAL

Hemul Chandola College Dhalgaon (M)

Tal-Basmat, Dist-Hingoli

Department Of Computer Science(2023-24)

Teaching Plan

Class- B.Sc. I

Semester – I

Subject – Computer Science

Paper – I Programming Using C

Day's	Task to be completed	Date	Attendance	Methodology
Day 1	Programming languages (Machine Languages, Assembly Languages, High level languages).	13-9-23	10	Lecture
Day 2	Compiler, Assembler, Interpreter.	15-9-23	11	Lecture
Day 3	Planning the Computer Program: Concept of problem solving.	16-9-23	9	Lecture
Day 4	Problem definition,Program design	18-9-23	8	Lecture
Day 5	Debugging: Types of errors in programming.	20-9-23	7	Lecture
Day 6	Documentation. Concept of Algorithm, Characteristics.	21-9-23	10	Lecture
Day 7	Notation of Algorithm. Designing Algorithms(writing step by step procedure).	22-9-23	11	Lecture
Day 8	Flowcharts: Definition, Symbol, features,representation in terms of flow chart.	25-9-23	12	Lecture
Day 9	Advantages and Limitations of Flow Charts,Pseudo code generation, Tracing, Testing.	27-9-23	8	Lecture

Day 10	History, Features of C,	22-3-23	1 Q	Lecture
Day 11	Structure of 'C' programming, C Tokens, Data types, Operators, Control Statements- Conditional control statements, Looping	24-3-23 to 27-3-23	12	Lecture Lecture
Day 12	Unconditional control statements- Array definition and declaration,	28-3-23	10	Lecture
Day 13	Types of array, Accessing Array, array manipulation searching,	29-3-23	10	Experimental
Day 14	Insertion, deletion of an element from an array,	30-3-23	11	Experimental
Day 15	Basic matrix operations, dynamic array,	31-3-23	12	ICT
Day 16	String-Declaration and initialization of string	03-4-23	08	ICT
Day 17	operation on string, inbuilt String handling functions,	04-4-23	9	ICT
Day 18	arithmetic operation on string,	05-4-23	10	Lecture
Day 19	table of string	06-4-23	11	Lecture
Day 20	Unit Test	07-4-23	12	Lecture
Day 21	Revision	10-4-23	12	Lecture

SWAPNALI J. R.
NAME OF HOD

SIGN OF HOD

SIGNATURE OF PRINCIPAL
PRINCIPAL
Hirabai Chandale College Shelgaon (R)
Tal-Barshi, Dist-Solapur

Hemuji Chandels College, Shelgaon (R).

Department Of Computer Science(2023-24)

Teaching Plan

Class- B.Sc. II

Semester – III

Subject – Computer Science

Paper – V: Data Structures

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	Introduction of Data Structure, Need of Data Structure	1-8-23	5	Lecture
Day 2	Types of Data Structure, ADT.	2-8-23	5	Lecture
Day 3	Stack: Introduction to stack, Representation static & dynamic	3-8-23	6	ICT
Day 4	stack Operations, Applications stack to postfix & prefix, postfix evaluation	4-8-23	6	ICT
Day 5	recursion, expression validity, Queue: Introduction to Queue, Representation static & dynamic	5-8-23	7	ICT
Day 6	Operations, Circular queue, Double ended queue, priority queues, Applications of Queue	7-8-23	8	ICT
Day 7	Linked List: introduction to List, Implementation of List – static & dynamic representations.	8-8-23	5	ICT
Day 8	Types of Linked List, Operations on List	9-8-23	5	ICT
Day 9	Applications of Linked List – polynomial manipulation	10-8-23	5	Lecture
Day 10	Trees: Concept & Terminologies, Binary Tree, Binary search tree, Representation – static &dynamic	11-8-23	6	Lecture
Day 11	Operations on BST – create, insert, delete, traversals (preorder, inorder, postorder), counting leaf, non-leaf & total nodes	12-8-23	6	Lecture
Day 12	Height balance tree, AVL, B tree, B+ Tree, Graph: Graph terminology	14-8-23	7	Lecture
Day 13	Representation of graphs, Graph	17-8-23	7	Lecture
Day 14	Traversal: BFS (breadth first search), DFS (depth	18-8-23	7	Lecture

	first search), Minimum spanning Tree	19-8-23	9	Lecture
Day15	TEST	22-8-23	2	writing
Day16	Sorting: Bubble sort,	23-8-23	7	Lecture
Day17	Quick sort,	24-8-23	5	Lecture
Day18	Simple Insertion sort,	26-8-23	4	Lecture
Day19	Shell sort	28-8-23	9	Lecture
Day20	Address calculation sort	29-8-23	5	Lecture
Day21	Selection Sort,	31-8-23	5	Lecture
Day22	Heap Sort	1-9-23	6	Lecture
Day23	Merge sort	2-9-23	6	Lecture
Day24	Unix test	3-9-23	6	Lecture
Day25	Radix Sort	6-9-23	7	Lecture
Day26	Searching: Linear Search,	8-9-23	6	Experimental
Day27	Binary Search,	9-9-23	6	Experimental
Day28	and Fibo searching methods,	12-9-23	7	Lecture
Day29	Multiway search tree	14-9-23	8	Lecture
Day30	Hash function (open and close)	18-9-23	8	Lecture
Day31	Revision of all Within	19-9-23	8	Lecture

Shivaprasad K.R.
NAME OF HOD

SIGN OF HOD

PRINCIPAL
Hemaj Chandra College Shalgaon (B)
Tal Barshi, Dist-Solapur

Hemaji Chandele College, Shelgaon (R).
Tal. Barshi, Dist. Solapur (Maharashtra) 413202

Department Of Computer Science(2023-24)

Teaching Plan

Class- B.Sc. II

Semester – III

Subject – Computer Science

Paper – VI: Software Engineering

Day's	Task to be completed	Dated on	Attendance	Methodology
Day1	System concepts: Introduction system, characteristics.	21-9-23	9	lecture
Day2	Elements of system, Types of system.	23-9-23	8	lecture
Day3	System Analysis, Role of System Analyst.	25-9-23	8	Lecture
Day4	. Software Engineering: Definition, Characteristics of software.	28-9-23	9	Lecture
Day5	Waterfall model, V-shape model.	30-9-23	3	Lecture
Day6	Spiral model, Prototyping.	31-9-23	8	Lecture
Day7	Incremental, RAD, Agile	1-10-23	7	Lecture
Day8	Software requirements: Types of Requirements	3-10-23	7	Lecture
Day9	System, Functional, Non-functional, User.	4-10-23	7	Lecture
Day10	Fact finding techniques: Interviews, Questionnaire.	5-10-23	6	ICT
Day11	Record reviews, Observation, Analysis and Design Tools.	7-10-23	7	ICT
Day12	Flow chart, Decision tables and Trees, Structured English	8-10-23	6	Lecture
Day13	JSP/SA System Design: Data flow Diagram (Physical, Logical).	7-10-23	7	lecture
Day14	Entity relation diagram ERD, Data Dictionary.	9-10-23	6	Lecture
Day15	Unit Test	10-10-23	8	writing
Day16	structured chart, Input and output design, Case studies: Pay Roll, Fixed Deposit, Invoicing	11-10-23	3	lecture

	System.	13-10-23	6	lecture
Day17	College Admission System, Library System, Loan system	13-10-23	8	Lecture
Day18	Coding: Coding standards, Size Estimation,	14-10-23	7	Lecture
Day19	Effort Estimation, and Cost Estimation, Software Testing: Need of Testing	16-10-23	7	Lecture
Day20	. types of testing, Software implementation and Maintenance: Traditional and incremental approaches.	17-10-23	5	Lecture
Day21	conversion methods, Overview of maintenance process	18-10-23	6	Lecture
Day22	types of maintenance, Software Quality Assurance:	19-10-23	6	Lecture
Day23	SQA Tasks, Goals and Metrics,	20-10-23	7	Lecture
Day24	Software Reusability	21-10-23	8	Lecture
Day25	Unit Test	23-10-23	9	Lecture
Day26	Software risk management: definition,	25-10-23	10	Lecture
Day27	types of risk	27-10-23	8	Lecture
Day28	risk identification	28-10-23	8	Lecture
Day29	risk monitoring and management	28-10-23	10	Lecture
Day30	Revision Of All Syllabus	30-10-23	11	Lecture

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Department Of Computer Science(2023-24)

Teaching Plan

Class- B.Sc. II

Semester – IV

Subject – Computer Science

Paper – ■ (Core Java)

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	Overview of Java, Features of Java as programming language	1-1-24	8	Lecture
Day 2	Platform, JDK Environment and Tools	2-1-24	9	Lecture
Day 3	Data types, Variables, Operators, Keywords, Naming	3-1-24	8	Lecture
Day 4	Conventions, Structure of Java Program	4-1-24	3	Lecture
Day 5	Flow Control: Decision, Iterations, Arrays	5-1-24	9	Lecture
Day 6	Class – Members access control, Objects, Constructors, Use of 'this' keyword, Static, non-static	6-1-24	10	Lecture
Day 7	Data members and methods, public, private & protected data members	8-1-24	8	Lecture
Day 8	Access/Scope specifiers protected, Super, inheritance, single,	9-1-24	8	Lecture
Day 9	multiple inheritance, Method overriding, Abstract classes & ADT, 'final' keyword, Extensibility	10-1-24	9	Lecture
Day 10	Interfaces	11-1-24	7	Lecture
Day 11	Exceptions and Types, try, catch, finally block, throw & throws	12-1-24	7	ICT
Day 12	statement, user defined exceptions,	13-1-24	7	Lecture
Day 13	Java I/O package, byte & character stream, reader & writer, file reader & writer	15-1-24	8	Lecture
Day 14	Java thread lifecycle, Thread class & runnable interface	17-1-24	8	ICT
Day 15	Thread priorities & synchronization, Usage of wait & notify	18-1-24	9	ICT
Day 16	wait & notify	19-1-24	10	Lecture

Day 17	Collection overview, Collection interfaces, Collection classes	30-1-24	7	Lecture
Day 18	Vector, Array list, Hash map, Hash table, Tree map, Tree set.	23-1-24	10	Lecture
Day 19	Hash set, Properties, Stack	24-1-24	8	Lecture
Day 20	Introduction to swing.	27-1-24	2	Experiment
Day 21	difference between AWT and swing, hierarchy of Swing classes.	29-1-24	4	Lecture
Day 22	Swing controls: - JButton, JTextField, JLabel, JCheckBox, JRadioButton, JFrame, JApplet, JList	30-1-24	8	Experiment
Day 23	JoptionPane, JMenubars and JMenu etc	31-1-24	9	Lecture
Day 24	Overview of Java.	1-2-24	7	Lecture
Day 25	Features of Java as programming language /Platform, JDK Environment and	2-2-24	7	Lecture
Day 26	Tools	3-2-24	8	Lecture
Day 27	Data types, Variables, Operators, Keywords, Naming	5-2-24	8	Lecture
Day 28	Conventions, Structure of Java Program, Flow Control: Decision, Iterations, Arrays	6-2-24	9	Lecture
Day 29	Unit Test	7-2-24	10	Coaching
Day 30	Class – Members access control, Objects, Constructors, Use of this keyword, Static, non-static	8-2-24	8	Experiment
Day 31	data members and methods., public, private & protected data members	9-2-24	8	Lecture
Day 32	Access/Scope specifiers protected, Super, extends, single.	10-2-24	3	Lecture

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Department Of Computer Science(2023-24)

Teaching Plan

Class- B.Sc. II

Semester – IV

Subject – Computer Science

Paper – VIII: DBMS Using Oracle

Day's	Task to be completed	Date/ on	Attendance	Methodology
Day1	Introduction to database system-Definition, Limitations of traditional file system, Advantages of DBMS.	12-2-24	8	Lecture
Day2	Components of DBMS, Database Architecture	13-2-24	8	Lecture
Day3	Database Users, Schemas and instances.	13-2-24	8	Lecture
Day4	2 tier and 3 tier architecture,	14-2-24	10	Lecture
Day5	Database languages, Types of data models- relational, Network,	15-2-24	11	Lecture
Day6	Hierarchical, Distributed	16-2-24	8	Lecture
Day7	Transaction Management & Concurrency Control - Introduction, Definition	17-2-24	9	Lecture
Day8	properties, transaction states, scheduling and its types	20-2-24	8	Lecture
Day9	conflict and view serializability, Introduction to Concurrency Control	21-2-24	8	Lect
Day10	problem of concurrency control, lock based protocols,	22-2-24	8	Lect
Day11	timestamp-based protocols, deadlock,	23-2-24	9	Lecture
Day12	deadlock handling, Database recovery and Security - Introduction, recovery algorithm,	24-2-24	8	Lecture
Day13	log base recovery, shadow paging, checkpoints or introduction to encryption.	26-2-24	8	Lecture
Day14	MCQ Test	27-2-24	10	Writing
Day15	SQL, DDL, DML, DCL,	28-2-24	11	Experimental
Day16	select, From, Where, Order by, Group by, Having, Intersect, Union,	29-2-24	12	Experimental

Day17	Distinct, Betweens, In, Between, Different types of functions, Delete.	1-3-24	10	Lecture
Day18	Update, Insert, Nested queries, joins, create, alter and drop;	2-3-24	3	Experimental
Day19	constraints, index, views, Triggers, Grant, Revoke, Commit, Rollback, Savepoint	4-3-24	8	Lecture
Day20	Introduction to PL/SQL: Advantages, Architecture, Datatypes.	5-3-24	8	ICT
Day21	Variable and Constants, Using Built-in Functions, Conditional, Looping and Sequence Statements.	6-3-24	9	Lecture
Day22	Cursor in PL/SQL: Types of Cursors, Cursor Attributes, Cursor with Parameters, Cursors with LOOPs/Nested Cursors.	7-3-24	8	Lecture
Day23	Cursors with Sub Queries and procedure. Procedures in PL/SQL: STORED PROCEDURES, PROCEDURE with Parameters (IN, OUT and IN OUT).	8-3-24	7	ICT
Day24	Dropping a Procedure.	11-3-24	7	Lecture
Day25	Functions in PL/SQL: Difference between Procedures and Functions.	12-3-24	7	Lecture
Day26	types of functions and parameter modes	13-3-24	8	Lecture
Day27	Exceptions in PL/SQL	14-3-24	8	Lecture
Day28	Unit Test	15-3-24	8	Evening

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Department Of Computer Science(If

Teaching Plan

Class- B.Sc. III

Semester – V

Subject – Computer Science

Paper – IX (Visual Programming Using C#)

Day's	Task to be completed	Dated on	Attendance	Methods
Day1	Block diagram of .net framework	1-2-23	3	Lecture
Day2	The Common Language Runtime, Advantages of Managed code	6-2-23	3	Lecture
Day3	A Closer Look at Intermediate Language & Assemblies Support for Object Orientation and interface	8-2-23	3	Lecture
Day4	Distinct Value and Reference Types	9-2-23	3	Lecture
Day5	Strong Data Typing, Garbage Collection	10-2-23	3	Lecture
Day6	**MCQ test**	13-2-23	3	coding
Day7	Compiling and Running the Program	15-2-23	3	Lecture
Day8	Variables, Data Types, Flow Control, Enumerations	16-2-23	3	Lecture
Day9	Namespaces, The using Statement, Namespace Aliases	17-2-23	3	Lecture
Day10	**Write a Assignment on unit**	20-2-23	3	coding
Day11	The Main() Method, Multiple Main() Methods	22-2-23	3	Lecture
Day12	Defining & using functions & its scope, Passing Arguments to Main(), Parameter passing techniques	24-2-23	4	Lecture
Day13	Types of Classes	27-2-23	4	Lecture
Day14	Classes and Structs	1-3-23	4	Lecture
Day15	Class Members: Data Members, Function Members read-only Fields, properties and indexer	3-3-23	3	ICT
Day16	The Object Class, System.Object Methods, The ToString() Method	6-3-23	3	Lecture
Day17	**TEST**	8-3-23	3	Lecture
Day18	Introduction, Types of Inheritance	10-3-23	3	ICT
Day19	Implementation Inheritance, Abstract Classes and Functions	13-3-23	3	ICT
Day20	Sealed Classes and Functions, Constructors and its types	15-3-23	3	Lecture
Day21	Destructor, Interfaces-Defining and implementing Interfaces, Derived Interfaces, Polymorphism - Method overloading, Operator overloading	29-3-23	4	Lecture

Day22	**Exception Handling:** Try, catch, and throw, finally, Nested try, Custom exception	30-8-23	1	Practical
Day23	**TEST**	31-8-23	3	Writing
Day24	**Threading:** Introduction, Applications with Multiple Threads	1-9-23	4	
Day25	Thread Properties, Synchronization, Life Cycle	2-9-23	3	Lecture
Day26	**Delegate and Events:** Delegates, Types of delegates: single cast, multicast and anonymous delegates, Events	4-9-23	3	Lecture
Day27	**IO and Collection Classes:** Streams Classes, Console I/O, File Stream and Byte-Oriented File I/O, Character Based File I/O.	5-9-23	4	Lecture
Day28	One step growth explanation	6-9-23	3	Lecture
Day29	**Assignment on unit**	8-9-23	3	Explanation
Day30	**TEST**	9-9-23	3	Writing
Day31	**Controls:** Common control Group, Data control Group	11-9-23	3	Lecture
Day32	Dialog control Group, Container control Group, Menus and Context Menus: Menu Strip, Toolbar Strip, SDI and MDI Applications	12-9-23	4	Lecture

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Department Of Computer Science

Class- B.Sc. III

Semester – V

Subject – Computer Science

Paper – X (Core Java)

Day's	Task to be completed	Dated on	Attendance	Method
Day 1	Overview of Java, Features of Java as programming language	13-9-23	4	Lecture
Day 1	Overview of Java, Features of Java as programming language	14-9-23	3	Lecture
Day2	Platform, JDK Environment and Tools	18-9-23	4	Lecture
Day3	Data types, Variables, Operators, Keywords, Naming	19-9-23	3	Lecture
Day4	Conventions, Structure of Java Program	20-9-23	2	Lecture
Day5	Flow Control: Decision, Iterations, Arrays	21-9-23	3	Lecture
Day6	Class – Members access control, Objects, Constructors, Use of 'this' keyword, Static non-static	22-9-23	4	Lecture
Day7	data members and methods, public, private & protected data members	25-9-23	4	Lecture
Day8	Access specifiers protected, Super, extends, single	26-9-23	3	Lecture
Day9	multiple inheritance, Method overriding, Abstract classes & ADT, final keyword, Extending	27-9-23	3	Lecture
Day10	interfaces	28-9-23	4	ICT
Day11	Exceptions and Types, try, catch, finally block, throw & throws	29-9-23	3	Lecture
Day12	statement, User-defined exceptions.	3-10-23	3	Lecture
Day13	Java I/O package, byte & character stream, reader & writer, file reader & writer	4-10-23	4	Lecture
Day14	Java thread lifecycle, Thread class & run able interface	5-10-23	3	ICT
Day15	Thread priorities & synchronization, Usage of	6-10-23	4	Lecture
Day16	wait & notify	7-10-23	4	Lecture
Day17	Collection overview, Collection interfaces, Collection classes	9-10-23	4	Lecture
Day18	Vector, Array list, Hash map, Hash table, Tree map, Tree set	10-10-23	4	Lecture
Day19	Hash set, Properties, Stack	11-10-23	3	Lecture
Day20	Introduction to swing	12-10-23	3	ICT
Day21	difference between AWT and swing, hierarchy of Swing classes.	13-10-23	3	ICT
Day22	Swing controls : JButton, JTextField, JLabel, JCheckBox, JRadioButton, JFrame, JTable, JList	14-10-23	3	Experiment

Day23	JupiterTime, Memotism and Mevie etc	14-10-23	3	Lecture
Day24	Overview of Java,	17-10-23	3	Lecture
Day25	Features of Java as programming language / Platform, JDK, Environment and	18-10-23	3	Lecture
Day26	Tools	19-10-23	3	Lecture
Day27	DataTypes, Variables, Operators, Keywords, Naming	20-10-23	3	Lecture
Day28	Conventions, Structure of Java Program, Flow Control: Decision, Iterations, Arrays,	21-10-23	3	Lecture
Day29	Unit Test	23-10-23	3	Methods
Day30	Class – Members access control, Objects, Constructors, Use of 'this' keyword, Static, non-static	2 times	3	Lecture
Day31	data members and methods, public, private & protected data members	26-10-23	4	Lecture
Day32	Access/Scope specifiers protected, Super, extends, single,	27-10-23	3	Lecture

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Department Of Computer Science

Class- B.Sc. III

Semester – V

Subject – Computer Science

Paper XI:- Operating System

Day's	Task to be completed	Dated on	Attendance	Method
Day 1	Definition Operating systems, Types of Operating Systems	26-8-23	5	Lecture
Day 2	Batch, Multiprogramming, Time	28-8-23	5	Lecture
Day 3	Sharing, Real-Time, Distributed, Parallel, OS Service, System components, System Calls, OS	29-8-23	3	Lecture
Day 4	Architecture, Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine	31-8-23	3	Lecture
Day 5	**Displaying PPT on projector Of Topic OS Introduction and types components Using ICT Tools**	1-9-23	2	ICT
Day 6	Concept of Process, Process states, Process Control Block, Context switching, Operations on	2-9-23	2	Lecture
Day 7	Process Cooperating Process, Threads - Types of threads, Benefits of threads,	5-9-23	3	Lecture
Day 8	Concept of Process Scheduling, Types of Schedulers, Scheduling criteria, Scheduling algorithms	5-9-23	3	Lecture
Day 9	Preemptive and Non-pre emptive, FCFS, SJF, Round Robin, Priority Scheduling, Multilevel Queue	6-9-23	3	Lecture
Day 10	Scheduling, Multilevel feedback Queue Scheduling,	8-9-23	2	Lecture
Day 11	**MCQ Test**	8-9-23	3	Lecture
Day 12	The Producer-Consumer Problem, Race Conditions, Critical Section Problem, Semaphores,	11-9-23	3	Lecture
Day 13	Classical Problems of Synchronization: Reader-Writer Problem, Dining Philosopher Problem,	12-9-23	3	Lecture
Day 14	Critical Regions,	13-9-23	3	Lecture
Day 15	Definition, System Model, Dead Lock Characterization, Resource Allocation Graph, Methods of	15-9-23	3	Lecture
Day 16	Handling Dead Locks- Deadlock Prevention, Deadlock Avoidance -Banker's Algorithm, resource	16-9-23	3	Lecture

Day17	request algorithm, Deadlock detection and Recovery.	18-3-23		
Day18	**Unit Test of mark**	20-3-23	2	writing
Day19	**Memory Management:** - Basic Hardware Address Binding, Logical and Physical address Space,	21-3-23	4	Lect
Day20	Dynamic Loading, Overlays, Swapping.	23-3-23	3	Lecture
Day21	**Memory allocation:** Contiguous Memory allocation – Fixed and variable partition – Internal and	25-3-23	3	Lecture
Day22	External fragmentation and Comparison, Paging, Segmentation, Basics of Virtual Memory,	28-3-23	3	Lecture
Day23	Test	29-3-23	4	writing
Day24	demand paging, Page fault, Page Replacement policies: Optimal (OPT), First in First Out (FIFO),	31-3-23	4	Lecture
Day25	Least Recently used (LRU), Thrashing.	30-3-23	4	Lecture
Day26	**Storage Management:**- File Management, File concept, Access methods, File types, File	4-10-23	4	Lecture
Day27	operation, Directory structure, File System structure, Allocation methods (contiguous, linked,	4-10-23	3	Lecture
Day28	indexed), Free space management (bit vector, linked list, grouping).	5-10-23	3	Lecture
Day29	**Disk Management:** disk structure, disk scheduling (FCFS, SSTF, SCAN, C-SCAN), disk	6-10-23	3	Lecture
Day30	reliability, disk formatting, boot block, bad blocks	7-10-23	3	Lecture
Day31	**Test MCQ**	9-10-23	4	writing
Day32	Revision	10-10-23	4	

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Day15	Manipulating list. Tuples: introduction to Tuples. Manipulating Tuples. Dictionaries: Concept	12-9-23	3	Lecture
Day16	of Dictionary. Techniques to create, update & delete dictionary items	18-9-23	3	Lecture
Day17	**Functions, Modules** :- Difference between a Function and a Method. Functions:- Defining a	20-9-23	3	Lecture
Day18	function, Calling a function. Advantages of functions. Types of functions. Function parameters:-	21-9-23	3	Lecture
Day19	Formal parameters. Actual parameters. Anonymous functions. Global and Local variables.	22-9-23	4	Lecture
Day20	Modules - Importing module. Creating & exploring modules. Math module. Random module.	25-9-23	3	Lecture
Day21	Time module	27-9-23	3	Lecture
Day22	**Unit Test**	28-9-23	4	Writing
Day23	Features. Concept of Class & Objects. Constructor. Types of Variables. Namespaces. Types of	29-9-23	4	Lecture
Day24	Methods. Inner Classes. Constructors in Inheritance. Overriding Super Class Constructors and	5-10-23	4	Lecture
Day25	It	6-10-23	3	Lecture
Day26	Methods. Types of Inheritance. Abstract Classes and Interfaces. The Super() Method. Operator	9-10-23	3	Lecture
Day27	Overloading, Method Overloading, Method Overriding	11-10-23	3	Lecture
Day28	Participatory Learning (group discussion On topic Of Application Of Python In Software Industries)	12-10-23	4	Participation
Day29	Introduction to Regular Expression. Advantages & Operations. Sequence characters in Regular	13-10-23	3	Lecture
Day30	Expression. Powerful pattern matching and searching. Password, email, url validation using	9-10-23	3	Lecture
Day31	regular expression. Pattern finding programs using regular expression	18-10-23	2	Lecture
Day32	**Exception** :- Errors in a Program. Exceptions. Exception handling. Types of Exceptions. User defined	19-10-23	2	Lecture
Day33	**Revision**	20-10-23	4	Lecture

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Class- B.Sc. I

Semester – I

Subject –CHEMISTRY

Paper – I (PHYSICAL CHEMISTRY)

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	CHEMICAL KINETICS – INTRODUCTION , and its scope	23/10/23	50	lecture
Day 2	Rate of reaction , definition, unit, factors affecters.	24/10/23	52	lecture
Day 3	Order and molecularity of reaction	27/10/23	61	lecture
Day 4	First order of reaction : derivation, characteristics , ex	31/10/23	70	lecture
Day 5	Second order reaction : derivation equal and unequal amount reactant	03/11/23	65	lecture
Day 6	Pseudomonomolecular reaction and numerical problem	04/11/23	40	Test
Day 7	TEST	06/11/23	45	Test
Day 8	THERMODYNAMICS : INTRODUCTION, and Basic information	10/11/23	50	lecture
Day 9	Spontaneous and non spontaneous process	11/11/23	40	Lecture
Day 10	Second law of thermodynamics and its statement	13/11/23	19	lecture
Day 11	Carnots theorem	14/11/23	18	Lecture
Day 12	Carnot cycle and its efficiency	15/11/23	20	lecture
Day 13	Numerical problem	16/11/23	25	lecture
Day 14	TEST	17/11/23	40	Test
Day 15	MATHEMATICAL CONCEPT : INTRODUCTION,	7/12/23	40	lecture
Day 16	Graphical representation : graph paper, co-ordinates of a point	8/12/23	45	lecture
Day 17	eq of straight line and intercept, plotting of graph based on exponential time	5/12/23	50	lecture
Day 18	Derivative : rules of differentiations without proof, pertaining	10/12/23	50	lecture

	to algebraic and exponential functions	17/9/22	60	lecture
	Examples related to chemistry	18/9/22	65	lecture
	Integrations; types of integrations	23/9/22	40	lecture
	Rules of integrations without proof pertaing to algebraic and exponentiational functions	24/9/22	50	Lecture
	Examples related to chemistry: numerical problems on expected	29/9/22	51	Lecture
	ASSIGNMENT ON UNIT TEST	6/10/22	60	Test
	MCQ TEST	7/10/22	65	m.c.q
	GASEOUS STATE: introduction	9/10/22	70	Lecture
	Ideal and non ideal gas	13/10/22	60	lecture
	Deviation from ideal behavior only (boyles law), causes of deviation from ideal behaviour .	14/10/22	65	Lecture
	Van der waals eq , explanation of real gas behaviour by van der waals eq explanation	16/10/22	79	lecture
	Critical phenomenon, PV isotherms of real gases , continuity of state	20/10/22	60	Lecture
	Liquefaction of gases , joule Thomson effect, and problems	21/10/22	62	lecture

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Class- B.Sc. I

Subject –chemistry

Semester -I

Paper No -II (INORGANIC CHEMISTRY)

	Task to be completed	Dated on	Attendance	Methodology
1	ATOMIC STUCTURE AND PERIODIC PROPERTIES : introduction	18/3/23	50	Lecture
Day2	Quantum mechanics , schrodinger equation, quantum number	19/3/23	50	Lecture
Day3	Shapes of S,P,D orbital, aufbau principle and pauli exclusion principle	20/3/23	41	Lecture
Day4	Hunds rule of maximum multiplicity stability of half and completely filled orbitals	21/3/23	65	Lecture
5	General electonic configuration of s and p block elements	22/3/23	55	Lecture
Day6	General characteristics of s and p block element s e.g atomic and ionic radii ,ionization energy ,electron affinity .	25/3/23	61	Lecture
Day7	Electronegativity, reactivity ,melting and boiling point	27/3/23	48	Lecture
Day8	TYPES OF CHEMICAL BONDING : ionic, covalent, co-ordinate ,metallic ,hydrogen bonding and weak chemical forces – van der waals forces ,dipole –dipole interaction , induced dipole interaction , with suitable example	28/3/23	49	Lectu
9	ASSINGMUNT UNIT TEST	29/3/23	52	lectu
Day10	2 . CHEMICAL BONDING AND IONIC SOLIDS introduction ,basic information	3/4/23	57	Lectu
Day11	Ionic bonding ,formation of ionic bond ,energetic of ionic bonding , ionisational potential ,electron affinity an lattice energy	4/4/23	53	Lectu
ay12	Characteristics of ionic compounds born haber cycle for	5/4/23	60	lect

	alkali metal halide(NaCl) , fajans rules	21/9/22	60	Lecture
y13	Radious ratio and crystal structure ,definition ,radius ratio (r+/r-) for ionic solids with octahedral geometry	29/9/22	61	Lecture
ay 14	Radius ratio effect on geometry	30/9/22	49	Lecture
Day 15	Crystal structure of NaCl and CSCl ,unit cell,radious ratio ,coordination number,stoichiometry	3/10/22	50	Lecture
Day16	TEST -	4/10/22	51	Lecture
Day17	COVALENT BOBNDING: VALANCE BOND THEORY (VBT) Introduction basic information	5/10/22	49	Lecture
Day18	Heither - London Theory and pauling - slater theory - merits and demerits	10/10/22	51	Lecture
Day19	NEED OF HYBRIDISATION with to $BeCl_2$, BF_3 ,$SiCl_4$	11/10/22	60	Lecture
Day20	TYPES of hybridization AND shapes of simple inorganic molecule ,PCl_5 ,SF_6	12/10/22	61	Lecture
ay21	VALENCE SHELL ELECTRON PAIR REPULSION (VSEPR) THEORY with NH_3 ,H_2O	17/10/22	50	Lecture
22	TEST -	18/10/22	51	Lecture
ay23	COVALENT BONDING: MOLECULAR ORBITAL THEORY (MOT) INTRODUCTION basic information	19/10/22	52	Lecture
y24	Atomic and molecular orbital	24/10/22	50	Lecture
y25	LCAO PRINCIPLE	25/10/22	51	Lecture
y26	Bonding antibonding and nonbonding molecular orbital	27/10/22	60	Lecture
y27	Conditions for successful overlap	26/10/22	62	Lecture

/28	Different types of overlap	22/10/22	50	Lec
29	Energy level sequence of molecular orbital for n=1 and n=2	28/10/22	40	Lec
Day30	M.O diagram homonuclear diatomic molecule	29/10/22	45	Lec
Day31	Hetero nuclear diatomic molecule CO, NO WITH BOND ORDER STABILITY AND MAGNETIC PROPERTIES	31/10/22	43	Lec
Day32	TEST MCQ	1/11/22	42	Lec

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Class- B.Sc. II

Subject –chemistry

Class- B.Sc. II

Subject –chemistry

Semester -III

Paper No –V- (ORGANIC CHEMISTRY)

/n	Task to be completed	Dated on	Attendance	Methodology
y1	ALCOHOL AND PHENOLS, INTRODUCTION, nomenclature dihydric alcohol, method of formation of ethylene glycol ,ethylene dibromide and ethylene oxide	23/8/22	27	Lecture
Day2	Physical properties and chemical reaction of ethylene glycol	24/08/22	25	Lecture
Day3	Acidic nature , reaction with hydrogen halide ; oxidation lead acetate	25/08/22	24	Lecture
Day4	HIO4 and nitric acid , uses of ethylene glycol	26/08/22	25	Lecture
5	Pinacol formation pinacol -pinacolone rearrangement and its mechanism	28/08/22	20	Lecture
Day6	TRIHYDRIC ALCHOLES nomenclature ,method of formation of glycerol	29/08/22	21	Lecture
Day7	Fats and oil physical properties , chemical reaction of glycerol	31/08/22	20	lecture
Day8	Reaction with electropositive metals , reaction with hydrogen halide HCl and HI reaction with conc. Nitric acid in presence of conc. Sulphuric acid	1/9/22	22	Lecture
9	Reaction with potassium hydrogen sulphate	11/9/22	24	Lecture
y10	Esterification , oxidation , uses of glycerol	12/9/22	21	Lecture
y11	**PHENOL** : introduction reaction of phenol (carbolic acid)	14/9/22	23	Lecture
y12	Acelyation and fries rearrangement ether formation and claisen rearrangement	15/9/22	20	Lecture
y13	Gattermann synthesis carboxylation –kolbe reaction	16/9/22	23	Lecture
y14	Reimer tiemann reaction and its mechanism	17/9/22	40	Lecture

...15	**TEST**	4/8/22	21	Lecture
...16	**Aldehyde and ketone** : introduction structure and reactivity of the carboxyl group.	8/8/22	22	Lecture
Day17	Mechanism of nucleophilic addition to carbonyl group 3 aldol condensation (base catalyzed)	9/8/22	24	Lecture
Day18	2)Perkin reaction 3) cannizaro reaction	10/8/22	20	Lecture
Day19	4) knoevenegel reaction 5) benezoin condensation	15/8/22	24	Lecture
Day20	TEST	16/8/22	22	Lecture
...21	**STEREOCHEMISTRY** : Geometrical isomerism : introduction geometrical isomerism in aldoxime and ketoximes	22/8/22	23	Lecture
Day22	Configuration of ketoximes Beckmann transformation configuration of alkylamines	26/8/22	18	Lecture.
Day23	Conformational isomerism : introduction conformation of ethane and n-butane and their representation by sawhorse	29/8/22	20	Lecture
Day24	Fischer and newmann projection formulae conformational analysis of ethane and n-butane with the help of energy profile diagram	2/9/22	16	Lecture
Day25	Nomenclature of D.L ,RS and EZ	6/9/22	25	Lecture
Day26	SPECTROSCOP METHOD ULTRA -VIOLET ABSORPTION : introduction to spectroscopy beer lambert law	7/9/22	19	Lecture
Day27	Types of electronic transitions terms used in UV spectroscopy	12/9/22	27	Lecture

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Class- B.Sc. II

Subject –chemistry

Semester -III

Paper No –VI (INORGANIC CHEMISTRY)

Day's	Task to be completed	Dated on	Attendance	Methodology
Day1	**Coordination chemistry** : introduction ,formation of coordinate covalent bond in BF_3 ,NH_3 and in (NH_4)	18/8/23	25	lecture
Day2	Distinction between double salt and complex salt .Werner theory ,postulate of theory	19/8/23	20	lecture
Day3	Application of theory for e.g $CoCl_3.6NH_3$,$CoCl_3.5NH_3$ etc	22/8/23	23	lecture
Day4	Defn. of terms : ligands, coordination sphere , coordination number , EAN geometrical isomerism and optical isomerism in coordination compound CN4 and CN6	1/09/23	25	lecture
Day5	IUPAC nomenclature of coordination compound	2/9/23	20	lecture
Day6	VBT of transition metal complexes introduction , postulate of VBT basic concept of VBT	5/9/23	24	lecture
Day7	Role of transition metal in formation of complex ation feature	6/9/23	22	lecture
Day8	Application of high and low spin complexes with CN4 and CN6, limitation of VBT	11/9/23	23	lecture

		12/3/23	25	Test
	OF D-BLOCK ELEMENTS : introduction, position of d-block elements	13/03/23	24	lecture
	ic and electronic configuration of first , second and third transition series	18/03/23	23	lecture
	General characteristic of 3 d block elements : oxidation state, colour ,	20/3/23	21	lecture
13	Magnetic behavior ,catalytic properties and tendency to form complexes	21/3/23	22	lecture
ay14	Comparison of 1st transition series with 2nd and 3rd transition series w.r.t electronic configuration	28/3/23	23	lecture
Day15	Reactivity ,stability of oxidation state :	30/3/23	24	lecture
Day16	Magnetic behavior and stability of complexes (final answer only)	31/03/23	25	lecture
Day17	TEST	4/10/23	22	Test
Day18	CHELATION :a brief introduction w.r.t ligand , chelation and metal chelate	5/10/23	23	lecture
Day19	Structural requirement of chelate and metal complex	10/10/23	25	lecture
Day20	Difference between metal chelate and metal complex	13/10/23	24	lecture
Day21	Classification of chelating agents and applications of chelation w.r.t chelating agents : EDTA and DMG	14/10/23	23	lecture
		21/10/23	25	Test
Day22	Test	23/10/23	20	lecture
Day23	ACIDS AND BASES : introduction , lewis concept			

	definition,classification.			
	Merites and demerits hard and soft acid and base :		21	lecture
	Classification of acids and bases as hard and soft.	25/10/23	22	lecture
	Pearsons HSAB concepts ,acid base strength and hardness - softness	26/10/23	21	lecture
	Application of HSAB	27/10/23	25	lecture
	Limitation of HSAB priniple	28/10/23	20	lecture
	Test	29/10/23	25	lecture
		29/10/23	27	Test

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	chromophore ,			lecture
	Auxochrome , bathochromic hypsochromic hypochromic and hyperchromic shifts	11/10/23	19	lecture
	Effect of conjugation on position of UV and visible bands - calculation of max by woodward fisher rules for conjugated dicen and enones	12/10/23	25	lecture
30	Application of Uv spectroscopy determine of structure and stereochemistry (cis and trans) Problems	17/10/23	20	lecture
31	Test	18/10/23	22	Test
32	**Ether and epoxides : ethers introduction nomenclature** method of formation of anisole by Williamson synthesis	19/10/23	27	lecture
33	Diazomethane ,chemical reaction of anisole with HI gravimetric estimation of OCH3 group by vieels method	22/10/23	25	lecture
34	Epoxides : introduction and nomenclature , comercial method of preparation of ethylene oxide acid and base catalysed ring opening of ethylene oxide	23/10/23	20	lecture
35	Test	25/10/23	27	Test
36	**Carboxylic acid :** Monocarboxylic acid introduction method of formation haloacid di and tri chloro acetic acid by HVz reaction	26/10/23	21	lecture
37	Hydroxy acids : malic acid, citric acid ,method of formation malic acid from maleic acid ,citric acid from glycerol	27/10/23	23	lecture
38	Unsaturated acid : method of formation acrylic acid from	28/10/23	25	lecture

	acrolein and by dehydration of beta hydroxyl peripionic acid	29/10/23	2.5	lecture
	Reaction of acrylic acid addition of Nb_2 reduction by Na use of acrylic acid cinnamic acid from benzaldehyde using DEM	30/10/23	2.6	lecture
40	Dicarboxylic acid: succinic and pathalic acid : method of formation of succinic acid from ethylene bromide malic acid	31/10/23	2.7	lecture
ay 41	Test :	1/11/23	2.5	Test
ay 42	**Diazonium salt** : introduction benzene diazonium chloride preparation chemical properties formation of diobenzene	2/11/23	2.0	lecture
ay 43	Sandmeyers reaction . formation of benzene . formation of phenyl hydrazine . azo coupling : synthesis of methyl orange and congored .	3/11/23	2.5	lecture
Day 44	Test	4/11/23	2.5	Test

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Dept. of Chemistry

Class- B.Sc. III

Semester – V

Subject –CHEMISTRY

Paper – I X (PHYSICAL CHEMISTRY)

Days	Task to be completed	Dated on	Attendance	Methodology
Day1	***Electromotive Force*** : Introduction thermodynamics of electrode potential , Nernst equation for electrode and cell potential	14/8/25	20	lecture
Day2	Types of electrode :description in terms of construction ,	16/8/25	21	lecture
Day3	Representation ,half cell reaction and cell equation	17/8/25	22	lecture
Day4	For metal -metal ion electrode , amalgam electrode metal in soluble salt electrode	19/8/25	23	lecture

	standard hydrogen electrode reference electrode standard electrode potential, sign conventions, electrochemical series and its significance, types of reversible electrodes- gas-metal ion, metal-insoluble salt-anion and redox electrodes, electrode reactions, Nernst equation, derivation of cell potential and single electrode potential, problems on Nernst equation and cell potential calculations,	21/8/23	24	lecture
	Electrode concentration cell , reversible to cation , reversible to anion , electrolyte concentration cell without transference	22/8/23	25	lecture
	Equilibrium constant from cell emf ,determination of thermodynamics parameters such as delta G delta H and delta S	23/8/23	25	lecture
	Application of emf measurements , determination of ph solution using hydrogen electrode solubility and solubility product of sparingly soluble salts	24/8/23	23	lecture
	Numerical problem	25/8/23	24	lecture
Day11	Test	26/8/23	22	Test
Day12	**PHASE EQUILLIBRIA:** Introduction gibbs phase rule ,phase rule equation and terms involves in equation	28/8/23	21	lecture
Day13	Phase diagram , true and meta stable equilibria ,one component system ,water system ,sulphur system	29/8/23	23	lecture
Day14	Two component system ,eutectic system ,fusion mixture of lead ,formation of compound with congruent m.p.	30/8/23	24	lecture
Day15	**Test**	31/8/23	25	Test
Day16	**PHOTOCHEMISTRY** : introduction ,difference between thermal and photochemical process	2/9/23	20	lecture
Day17	Laws of photochemistry : 1) Grotthus draper law ,lambert law ,lambert beer law	4/9/23	21	lecture
Day18	Stark einstein law, quantum yield reason for high quantum yield and low quantum yield	6/9/23	22	lecture
Day19	Photosynthesis reaction , dissociation of H2 ,photosynthesis ,photoionization of anthracene	7/9/23	23	lecture
Day20	Jablonski diagram ,fluorescences and phosphorescence	8/9/23	24	lecture
	Chemiluminescence ,numerical problems	9/9/23	25	lecture

	TEST	11/9/23	25	Test
	Quantum Mechanics	11/9/23	20	lecture
	Failures of classical mechanics, origin	12/9/23	21	lecture
	Black Body radiation, distribution	13/9/23	23	lecture
25	planck's quantum theory of black body	14/9/23	24	lecture
26	photoelectric effect, explain the basis of	15/9/23	25	lecture
27	Compton effect.	18/9/23	20	lecture
28	De-Broglie hypothesis	3/10/23	21	lecture
29	Heisenberg uncertainty Principle	5/10/23	22	lecture
30	Schrodinger wave eqn, phy significance	6/10/23	25	lecture

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"Education is a ladder to gather fruits of knowledge"

Tuljabhavani Mandir's

Hemuji Chandele College, Shelgaon (R),

Tal. Barshi, Dist. Solapur (Maharashtra) 413223

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Class- B.Sc. III

Semester – V

Subject –CHEMISTRY

Paper – X(INORGANIC CHEMISTRY)

July's	Task to be completed	Dated on	Attendance	Meth
July 1	METAL LIGAND BONDING IN TRANSITION METAL	14/9/23	20	lec

	COMPLEXES : Introduction , crystal field theory (CFT)	14/8/23	2.1	lecture
	Basic concept of CFT , formation of complex with cryst field splitting of d orbital, shape of d orbital and electron density .	17/8/23	2.2	lecture
	Formation of octahedral complex with example e.g. High and low spin octahedral complex of CO^{III} ,COF_6	17/8/23	2.3	lecture
	FORMATION OF TETRAHEDRAL COMPLEX with CFS of d orbital with ex	19/8/23	2.4	lecture
	Formation of square planner complex with cfs of d orbital with ex	21/8/23	2.5	lecture
	John teller distortion, factor affecting on crystal field splitting	22/8/23	2.5	lecture
	CFSE calculation of octahedral complexes only	23/8/23	2.3	lecture
	Application and limitation of CFT	24/8/23	2.4	lecture
	TEST	25/8/23	2.2	Test
	MOT introduction , basic concept , symmetry classes of atomic orbital	26/8/23	2.1	lecture
	Formation of octahedral complex , assumption , MO energy energy diagram for hypothetical octahedral complex	28/8/23	2.3	lecture
	e.g. octahedral complex with sigma bonding e.g. FeF_6 ,COF_6 ,$CO(NH_3)_6$	29/8/23	2.4	lecture
	Application and limitation of MOT , comparison between CFT and MOT	31/8/23	2.5	lecture
	TEST	1/9/23	2.0	Test
	NUCLEAR CHEMISTRY : nuclear reaction and energetic of nuclear reaction	4/9/23	2.1	lecture
	Classification of nucleus reaction - artificial transmutation ,artificial radio activity , projectile capture reaction.	5/9/23	2.2	lecture
	Projectile capture particle emission reaction ,nuclear fission	6/9/23	2.3	lecture
	Nuclear fission , use of uranium , thorium , plutonium,nuclear reactor	7/9/23	2.4	lecture
	Atomic bomb, application of radio isotope as tracer element ,	8/9/23	2.5	lecture

	TEST	3/3/23	2.5	Test
	BIOINORGANIC CHEMISTRY: Essential and trace element in biological process	11/3/23	2.0	lecture
	Essential element , macro ,micro element , non essential element	12/3/23	2.1	lecture
	Structure of hemoglobin , structure of myglobin	13/3/23	2.3	lecture
	Function of Hb,Mb ,cooperativity effect , oxygen binding curve ,differetice between Hb and Mb	14/3/23	2.4	lecture
	Role of alkali and alkaline earth metal ions with Na^+ $K^+$and Ca^{2+}	15/3/23	2.5	lecture
	Test	16/3/23	2.0	Test
	CATALYSIS : introduction ,classification of catalytic reaction ,homogenous and heterogenous	18/3/23	2.1	lecture
Day28	Types of catalysis ,characteristics of catalytic reaction , mechanism of catalysis	20/3/23	2.2	lecture
Day29	Adsorption theory ,industrial application of catalysis	21/3/23	2.5	lecture
Day30	TEST	25/3/23	2.0	Test
Day 31	**FERTILIZERS** : Nutrient function in plant growth NK PK	3/10/23	2.1	lecture
Day32	Defination quality of ideal fertilizer , types of fertilizer manufacture of fertilizer e.g. urea ,superphosphate ,ammonium phosphate ,triple super phosphate ,pollution caused by fertilizer	4/10/23	2.2	lecture
Day33	TEST	5/10/23	2.3	Test

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Class- B.Sc. III

Semester – V

Subject –CHEMISTRY

Paper – XI(ORGANIC CHEMISTRY)

Day's	Task to be completed	Dated on	Attendance	Methodology
Day1	INFRARED SPECTROSCOPY: INTRODUCTION	14/8/23	20	lecture
Day2	Principle of IR spectroscopy, double beam IR spectrometer, fundamental mode of vaibrations, types of vaibrations	17/8/23	21	lecture
Day3	Hooks law, factors affecting values of vaibrational frequencies, conditions for absorption of radiation and selection rule	19/8/23	22	lecture
Day4	Fundamental group regions of IR spectrum, finger print region, aromatic region, characteristics absorption of various functional groups	24/8/23	23	lecture
Day5	Applications of IR spectroscopy- determination of structure, identification of functional groups, spectral problems based on IR	25/8/23	24	lecture
Day6	TEST	26/8/23	25	Test
Day7	NMR SPECTROSCOPY: Introduction	28/8/23	25	lecture
Day8	Proton magnetic resonance spectroscopy, principles of PMR spectroscopy, magnetic and non magnetic nuclei	1/9/23	23	lecture
Day9	Theory of PMR spectroscopy- spinning nuclei, magnetic moment and magnetic field precessional motion of nuclei without mathematical details, nuclear resonance	5/9/23	24	lecture
Day10	NMR instrument, schematic diagram, shielding and deshielding effect, chemical shift, measurement of chemical shift by delta scale and tau scale	9/9/23	22	lecture
Day11	TMS as reference, advantage of TMS, PEAK AREA, spin-spin splitting (n+1 rule), definition of coupling constant, values of first order coupling	11/9/23	21	lecture
Day12	PMR spectra of ethanol, ethyl bromide, acetaldehyde,1,1,2-tribromoethane, ethyl acetate, acetophenone, benzaldehyde, propanoic acid and benzoic acid	16/9/23	23	lecture
Day13	Problems pertaining to the structure elucidation of simple organic compound using PMR spectrometer data	18/9/23	24	lecture

	MASS SPECTROSCOPY : introduction	25/9/23	25	lecture
	theory of mass spectroscopy , mass spectrometer – schematic diagram , formations of ions by ionization	26/9/23	2.0	lecture
	Types of ions with example , applications of mass spectroscopy 1) determination molecular weight 2) determination of molecular formula	27/9/23	2.1	lecture
	Stereochemistry : introduction,	28/9/23	2.2	lecture
	Baeyer strain theory , theory of strainless ring : conformation and stability of cyclohexane – axial monosubstituted cyclohexane – methylcyclohexane	30/9/23	2.3	lecture
	Locking of conformation in t-butylcyclohexane , stereoselective and stereospecific reactions	3/10/23	2.4	lecture
Day20	Stereochemistry of addition of halogens to alkene : syn and anti- addition: example 1) stereochemistry of addition of bromine to 2- butene	4/10/23	2.5	lecture
Day21	Alkaline hydrolysis of 2- chlorobutane to 2- butanol	6/10/23	25	lecture
Day22	Test	7/10/23	2.0	Test
Day23	NAME REACTION: introduction	9/10/23	2.1	lecture
Day24	Mechanism and applications of following reactions: claisen condensation , oppenauer oxidation	12/10/23	2.3	lecture
Day25	Meerwein ponndorf verleyreduction, reformatsky reaction , hofmann rearrangement	14/10/23	2.4	lecture
Day26	witting reaction, related problems	18/10/23	2.5	lecture
Day27	Test	20/10/23	2.0	Test
Day28	ORGANIC SYNTHESIS VIA ENOLATES: Introduction	21/10/23	2.1	lecture
Day29	Reactive methylene group , ethyl acetoacetate – synthesis by claisen condensation , acidity of methylene hydrogen , keto enol tautomerism , synthesis , applications – synthesis of alkyl and dialkyl derivatives ,	23/10/23	2.2	lecture
Day30	Mono basic , dibasic and alpha and beta unsaturated	28/10/23	2.5	lecture

Diethyl malonate - test

27/10/23 23 TEST

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Class- B.Sc. III

Semester – V

Subject –CHEMISTRY

Paper – XII(ANALYTICAL AND INDUSTRIAL PHYSICAL CHEMISTRY)

	Task to be completed	Dated on	Attendance	Mediums
	COLORIMETRY : introduction ,theories of colorimetry ,lambert law,beers law ,terms used in colorimetry	14/8/23	20	lecture
2	Application of beers law ,davitation from beer law	17/8/23	21	lecture
3	Classification method of colour ,photoelectric photometer method –single cell photoelectric colorimeter	25/8/23	22	lecture
4	Test	31/8/23	23	Test
5	POTENTIOMETRY : introduction ,study of calomel ,quinhydron and glass electrode	22/8/23	24	lecture
6	Basic circuit diagram of direct reading potentiometer titration ,acid base titration, redox titration	1/9/23	25	lecture
7	Precipitation titration ,advantages of potentiometry	5/9/23	25	lecture
8	Test	9/9/23	23	Test
9	FLAME PHOTOMETRY: introduction , general principle	11/9/23	24	lecture
10	Instrumentation , block diagram ,types of burner	16/9/23	22	lecture
11	Application in qualitative and quantitative analysis ,	18/9/23	21	lecture
12	Limitation of flame photometry	25/9/23	23	lecture
13	Test	29/9/23	24	Test
14	**ELECTROPLATING :** introduction ,electrolysis faraday law	27/9/23	25	lecture
15	Basic principle of electro plating ,cleaning of article	30/9/23	20	lecture
16	Electroplating of nickel and chromium ,anodizing	3/10/23	21	lecture
17	Test	5/10/23	22	Test
18	**CONDUCTOMETRY** : basic circuit of DC ,wheatstone bridge ,measurements of conductance	6/10/23	23	lecture
19	Use of alternating current , conductivity water ,different types of conductivity cells ,cell constant	7/10/23	24	lecture
20	Equivalent and molar conductance ,conductometric acid base	9/10/23	25	lecture

Class – B.Sc. I

Subject-chemistry

Paper – ORGANIC CHEMISTRY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	FUNDAMENTALS OF ORGANIC REACTION mechanism – INTRODUCTION OF REACTION	16/10/23	60	lecture
Day2	TYPES OF ARROW NOTATION – SINGAL HEADED ARROW, HALF HEADED ARROW, DOUBLE HEADED ARROW	20/10/23	61	lecture
Day3	TYPES OF BOND BREAKING – HOMOLYTIC AND HETEROLYTIC	21/10/23	59	lecture
Day4	TYPES OF REAGENT – ELECTROPHILIC AND NUCLEOPHILIC	23/10/23	55	lecture
Day5	TYPES AND SUB TYPES OF FOLLOWING REACTION – ELIMINATION & at least one reaction	25/10/23	56	lecture
Day6	REACTIVE INTERMEDIATE CARBOCATION, CARBOANION, CARBON FREE RADICAL, CARBENES, NITRENES	27-10-23	54	lecture
Day7	TEST	30-10-23	57	Test
Day 8	STRUCTURE AND BONDING – HYBRIDISATION – sp^3, sp^2 & sp, hybridisation	31-10-23	53	lecture
Day9	Resonance effect – phenol, and nitrobenzene	02-11-23	45	lecture
Day10	Inductive effect – with example	03-11-23	49	lecture
Day11	Hyperconjugation – w.r.t toluene	06-11-23	50	lecture
Day12	steric effect – w.r.t maleic acid	08-11-23	51	lecture
Day13	TEST	10-11-23	53	Test
Day14	STEREOCHEMISTRY FOR ORGANIC COMPOUND – INTRODUCTION, BASIC INFORMATION	13-11-23	54	lecture
Day15	OPTICAL ISOMERISM, GEOMETRICAL ISOMERISM, CONFORMATIONAL ISOMERISM	15-11-23	55	lecture
Day16	OPTICAL ACTIVITY – ESSENTIAL CONDITION FOR	17-11-23	58	lecture

	OPTICAL ACTIVITY – ELEMENT OF SYMMETRY		53	
8	ENANTIOMERS AND DIASTEREOCHEMISTRY.	21-11-23	60	lecture
9	Racemic modification	22-11-23	61	lecture
	Geometrical isomerism.			
20	cause of geometrical isomerism	23-11-23	62	lecture
	Geometrical isomerism			
	w.r.t C = C Geometrical isomerism in	24-11-23	67	lecture
	maleic acid and fumaric acid			
Day21	TEST	27-11-23	58	TEST
Day22	**CYCLOALKANES – INTRODUCTION**	28-11-23	56	lecture
Day23	Nomenclature methods of			
	formation (a) Internal Wurtz reaction	1-11-23	55	lecture
Day24	(b) Decarbonation of calcium or barium salt of			
	dicarboxylic acid	1-11-23	54	lecture
Day25	Chemical properties of cyclopropane (i) Free			
	radical substitution of			
	chlorine in presence of light.	2-12-23	53	lecture
Day26	(ii) Action of HBr and conc.			
	H_2SO_4 (iii) Catalytic reduction by H/Ni	3-11-23	52	lecture
Day27	**TEST**	4-11-23	51	TEST
Day28	**4. Alkenes, Dienes and**			
	Alkynes	5-11-23	49	TEST
Day29	4.1 Nomenclature of alkenes 4.2 Methods of			
	formation of		48	
	alkenes with mechanism i) By dehydration of	5-11-23		lecture
	lower			
Day30	ii) By dehydrohalogenation of lower alkyl			
	halides. 4.3 Chemical reactions of			
	alkenes - Hydrogenation,	7-11-23	47	lecture
	Electrophilic and free radical			
Day31	Hydroboration, Oxidation,			
	Epoxidation, Ozonolysis, Hydration,	8-11-23	50	lecture
	Hydroxylation,			
	Oxidation with $KMnO_4$, Polymerisation of			
	alkenes - ethylene and			
Day32	4.4 Nomenclature and			
	classification of dienes. 4.5 Isolated,	9-11-23	51	lecture
	Conjugated and			
	cumulated dienes. 4.6 Butadiene-Methods of			
	formation,polymerization,1,2			
	and 1,4 additions and Diels-			
DAY 33	4.7 Alkynes - Nomenclature,	10-11-23	52	lecture
	Acidity of alkynes. 4.8 Electrophilic and			
DAY 34	Nucleophilic addition reactions,			
	Hydrohalogenation, oxidation.			

	5. Stereochemistry of organic compounds: 5.1 Types of stereoisomerism - Optical isomerism, Geometrical isomerism and Conformational isomerism	12-11-23	55	lecture
	5.2 Chiral center (Explanation with lactic acid) 5.3 Elements of symmetry	13-11-23	56	lecture.
	5.4 Optical isomerism in lactic acid, tartaric acid and 2,3 - dihydroxybutanoic acid 5.5 Enantiomers and diastereoisomers.	16-11-23	57	lecture
	5.6 Racemic modification 5.7 Geometrical isomerism: cause of geometrical isomerism 5.8 Geometrical isomerism w.r.t. C = C Geometrical isomerism in maleic acid and fumaric acid	17-11-23	58	lecture.
	Hyperconjugation w.r.t toluene	16-11-23	59	ICT
	Steric effect w.r.t mesitilic acid	18-11-23	60	lecture
	6. Aromaticity and Benzene: 6.1 Meaning of the terms - Aromatic, non-aromatic, antiaromatic and pseudoaromatic compounds. 6.2 a) Kekule structure of benzene	19-11-23	61	lecture.
	b) Resonance structures of benzene. c) Molecular orbital picture of benzene. d) Representation of benzene	20-11-23	62	lecture.
	6.3 Modern theory of aromaticity. Fundamental Concepts - delocalization of electron	21-11-23	63	lecture.
	coplanarity and Huckel's $(4n+2)\pi$ rule. Applications of Huckel's rule to naphthalene	22-11-23	64	lecture
	pyrrole and pyridine. 6.4 Mechanism of electrophilic aromatic substitution in benzene w.r.t. nitration, sulphonation, halogenation and Friedel - Craft's reaction: alkylation, acylation	23-11-23	65	lecture.

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Class – B.Sc. I

Subject-chemistry

Paper – ANALYTICAL CHEMISTRY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	**1. Physical properties of liquids** 1.1 Introduction, additive and constitutive properties 1.2 Viscosity: coefficient of viscosity, determination of viscosity by Ostwald's Viscometer	24-11-23	62	lecture
Day2	1.3 **Surface tension:** Determination of surface tension by Drop – Weight method	25-11-23	59	lecture
Day3	1.4 **Parachor:** Machod equation and its modification by Sugden; applications of parachor in the determination of molecular structure as benzene and NO2	26-11-23	57	lecture
Day4	1.5 **Dipole moment:** electrical polarization of molecules 1.6 Use of dipole moment in the study of Molecular structure	28-11-23	58	LCT
Day5	1.7 **Refractometery:** Refractive index, Snell's law 1.8 Specific and molecular refractivity. Abbe's refractometer: Principle critical angle	29-11-23	57	lecture
Day6	phenomenon constitution, working and advantages 1.9 Molecular refractivity and chemical constitution	30-11-23	58	lecture
Day9	test	1-12-23	59	Test
Day10	**2. Qualitative and Quantitative analysis** 4.1 Qualitative analysis of Carbon, Hydrogen, Nitrogen & Sulphur	2-12-23	60	lecture
Day 11	4.2 Quantitative analysis of - i) Carbon and hydrogen by Combustion	5-12-23	61	lecture

	method ii) Nitrogen by Kjeldahl's method iii) Halogen and Sulphur by Carius method			lecture
Day 12	4.3 Determination of molecular weight of an acid by titration method	4-11-23	51	lecture
Day 13	4.4 Empirical formula and molecular formula determination. (Numerical Problems Expected)	5-11-23	52	lecture
Day 14	test	6-11-23	53	Test
Day15	**3 Analysis of food product** nutritional value of foods , idea about processing and food preservation and adulteration	7-11-23	54	lecture
Day16	Identification of adulterants in some common food items like milk , coffee powder ,chilli powder , turmic powder ,coriander powder ,pulses	8-11-23	55	lecture
Day17	test	9-11-23	56	Test
Day18	**4 Chromatography** introduction and general principle of chromatography	10-11-23	56	lecture
Day19	Classification of chromatography based on nature of stationary and mobile phase	11-11-23	57	lecture
Day20	Paper chromatograph : principle , experimental procedure and applications	12-11-23	58	lecture
Day21	1) fundamental of analytical chemistry : basic principle of titrimetric analysis and classification	13-11-23	59	lecture
Day22	Preparation and dilution of reagents	14-11-23	60	lecture
Day23	Normality , molarity and mole fraction weight by weight ,	16-11-23	61	lecture
Day24	Preparation of pure laser solution from source materials	17-11-23	62	LCT
Day25	Problems are expected	18-11-23	63	lecture
Day26	Test	19-11-23	64	Test
Day27	conversion factors ,density and specific gravity of solvent	20-11-23	60	lecture
Day28	weight by volume , use of N1V1=N2V2 formula	21-11-23	61	lecture

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Class – B.Sc. II

Subject-chemistry

Paper – PHYSICAL CHEMISTRY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	**Electrochemistry** - Introduction, conduction of electricity, Types of conductors, electronic and electrolytic	22-12-23	36	lecture
Day2	Explanation of terms : Conductance, Specific resistance, specific conductance, Equivalent conductance, Molecular conductance,	23-12-23	38	lecture
Day3	Variation of specific and equivalent conductance with concentration,	24-12-23	35	lecture
Day4	Migration of ions, Hittorf's rule, Transport number, Determination of transport number by moving boundary method,	1-1-24	33	lecture
Day5	factors influencing transport number: Nature of electrolyte,	3-1-24	34	lecture
Day6	Kohlrausch law, Applications of Kohlrausch law :	3-1-24	32	lecture
Day9	I.e. Numerical problems	4-1-24	31	lecture
Day10	**Thermodynamics – INTRODUCTION**	4-1-24	30	lecture
Day11	concept of entropy, Entropy as a state function Definition,	5-1-24	34	lecture.

	mathematical expression, unit, physical significance of entropy.			
Day 12	Entropy changes for reversible and irreversible processes in isolated systems	6-1-24	32	lecture.
Day 13	Entropy changes for an ideal gas as a function of V and T and as a function of P and T.	8-1-24	31	lecture
Day11	Entropy change in mixing of gases	9-1-24	30	lecture
Day12	Entropy change in physical transformations :	10-1-24	29	lecture
Day13	Third law of thermodynamics	11-1-24	28	lecture
Day14	Determination of entropy changes in chemical reactions	12-1-24	35	lecture
Day15	Numerical problems	13-1-24	36	lecture
Day16	TEST	17-1-24	37	Test
Day17	THE SOLID STATE – INTRODUCTION SPACE LATTICE , UNIT CELL , LATTICE PLANES .	18-1-24	38	lecture
Day18	LAWS OF CRYSTALLOGRAPHY , - LAWS OF CONSTANCY OF INTERFACIAL ANGLES .	19-1-24	39	lecture
DAY19	WEISS INDICES AND MILLER INDICES	20-1-24	24	lecture
Day20	CUBIC LATTICE & TYPES OF CUBIC LATTICE .	23-1-24	25	lecture
DAY21	DIFFRACTION OF X- RAY .DERIVATION OF BRAGG,S EQUATION .	24-1-24	26	lecture
Day22	DETERMINATION OF CRYSTAL STRUCTURE OF NACL AND KCL ON THE BASIS OF BRAGG,S EQUATIONS .	27-1-24	27	lecture
Day23	NUMERICAL PROBLEMS	25-1-24	28	lecture
Day24	TEST	30-1-24	29	Test
Day25	DISTRIBUTION LAWS - INTRODUCTION -	31-1-24	30	lecture
DAY 26	NERST DISTRIBUTION LAW , LIMITATION , AND MODIFICATION , WITH RESPECT ASSOTION .	1-2-24	32	lecture
DAY 27	APPLICATION OF DISTRIBUTION LAW .	2-2-24	33	lecture
DAY28	NUMRICAL PROBLEMS .	3-2-24	34	lecture
DAY29	TEST	5-2-24	35	Test
		6-2-24		lecture

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Class – B.Sc. II

Subject-chemistry

Paper – ANALYTICAL & INDUSTRIAL INORGANIC CHEMISTRY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	**Volumetric Analysis :- INTRODUCTION,** Terminology	7-2-24	39	lecture
Day2	Titrant; Titrand, standard solution; Titration indicator; Equivalence point; End .	8-2-24	38	ICT
Day3	Primary standard ,Secondary standard Strength of solution, volumetric analysis & their types	10-2-24	36	lecture
Day4	Acid Base Titration :) Introduction	12-2-24	37	lecture
Day5	Theory of Acid-Base indicator : A) Colour change Interval B) Theories- Ostwald's theory	13-2-24	35	lecture
Day6	Neutralization curve and choice of indicator for following titrations :-	14-2-24	31	lecture
Day7	Complexometric titrations: General accountion :	15-2-24	31	lecture
Day8	Types of EDTA Titrations	16-2-24	32	lecture.
Day 11	Metallochromic Indicator w.r.t. Eriochrome Black-T	17-2-24	30	lecture.
Day 12	**TEST**	20-2-24	30	Test
Day 13	**Gravimetric Analysis:** -Introduction, Terminology :- Gravimetric analysis, Saturation,	21-2-24	30	lecture
Day14	Super-saturation, Sol, Gel, Coagulation or Flocculation,	22-2-24	30	lecture.

y12	Coagulation or Flocculation value.	23-2-24	29	lecture
h13	General steps involved in Gravimetry.	24-2-24	29	lecture
Day14	Precipitation – A) Physical nature of Precipitate: Colloidal, Curdy and Crystalline.	26-2-24	29	lecture
Day15	Conditions of Precipitation 2.4. Process of precipitation – A) Nucleation B) Crystal growth C)DIGESTION	27-2-24	29	lecture
Day16	Co-precipitation and Post precipitation and their difference.	28-2-24	31	lecture
Day17	Role of Organic precipitants in gravimetric analysis	29-2-24	31	lecture
Day18	Study of organic precipitants viz. A) DMG, B) Aluminon, C) 8-Hydroxyquinoline.	1-3-24	32	lecture.
Day19	Advantages and disadvantages of organic precipitants	2-3-24	33	lecture.
Day20	TEST	4-3-24	34	Test
Day21	**Industrial heavy Chemicals** Introduction	5-3-24	35	lecture
Day22	Physicochemical Principles & manufacture of following heavy chemicals:	6-3-24	28	lecture
Day23	Ammonia by Haber process	7-3-24	29	lecture
Day24	ii) Sulphuric acid by contact process	9-3-24	30	lecture
Day25	TEST	11-3-24	31	Test
DAY 26	**Metallurgy:** Introduction: Terminology - Metallurgy.	12-3-24	32	lecture
DAY27	Occurrence of metals: Types of ORES	13-3-24	33	lecture
DAY28	Steps involved in metallurgical processes: A) Concentration of ores	14-3-24	34	lecture.
DAY29	Physical methods involve separation method.	15-3-24	35	lecture
DAY 30	Gravity separation method Chemical Methods	16-3-24	30	lecture
DAY31	Calcination b) Roasting	18-3-24	31	lecture.
DAY32	Reduction- i) Chemical methods of reduction	19-3-24	32	lecture.
DAY33	Electrolytic reduction method for e.g. Aluminium and copper	20-3-24	33	lecture.
DAY34	TEST	21-3-24	34	Test
DAY35	**Iron and Steel:** Occurrence of Iron	22-3-24	35	lecture.

36	Extraction of Iron: Blast furnace	22-3-24	31	lecture.
37	Types of Iron	23-3-24	32	lecture.
DAY38	Steel- A) Definition B) Types of Steel	1-1-24	30	lecture.
DAY 39	Manufacture of Steel: a) Bessemer process b) L. D. process D) Heat treatment on Steel	2-1-24	29	lecture.
		3-1-24	28	TEST
DAY 40	TEST			

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Class – B.Sc. III

Subject-chemistry

PAPER – PHYSICAL CHEMISTRY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	**Spectruscopy** – Introduction. Electromagnetic radiation.	4-1-24	22	lecture
Day2	Electromagnetic spectrum. Energy level diagram	5-1-24	21	lecture
Day3	Rotational spectra of diatomic molecules : Rigid rotor model; moment of inertia (derivation not expected)	6-1-24	20	Test
Day4	(Maxwell - Boltzmann distribution), determination of bond length, isotope effect. Interaction of radiation with rotating molecule	8-1-24	23	lecture
Day5	Vibrational spectra of diatomic molecules :	9-1-24	24	lecture
Day6	Simple Harmonic oscillator model, Vibrational energies of diatomic molecules. Determination of force constant, overtones. Interaction of radiation with vibrating molecules	10-1-24	25	lecture
Day7	Numerical problems	11-1-24	20	lecture.
Day10	**TEST**	12-1-24	21	Test
Day 11	**Solution**- Introduction	17-1-24	20	lecture
Day 12	Ideal solutions, Raoult's law, vapour pressure of ideal and non ideal solutions of miscible liquids	18-1-24	22	lecture
Day 13	Vapour pressure and boiling point diagrams of miscible liquids	19-1-24	23	lecture
Day14	Type I : Systems with intermediate total	20-1-24	24	lecture.

	Vapour pressure.			
2	Type III :Systems with a minimum in the total vapour pressure	23-1-24	25	lecture
Day13	Solubility of partially miscible liquids	24-1-24	24	lecture
Day14	Maximum solution temperature type Phenol - water system.	27-1-24	23	lecture
Day15	Minimum solution temperature type :Triethyl amine - water system.	29-1-24	22	lecture
Day16	Maximum and minimum solution temperature type : Nicotine - water system.	30-1-24	21	lecture
Day17	**TEST**	31-1-24	20	Test
Day18	**THERMODYNAMIC -INTRODUCTION**	1-2-24	19	lecture
Day19	FREE ENERGY , GIBBS ENERGY ,HELMHOLTZ FUNCTION.	2-2-24	22	ICT
Day20	**RELEATION BETWEEN G AND H : GIBBS HELMHOLTZEQUATION .**	3-2-24	23	lecture
Day21	PHASE EQUILIBRIA , CLAPEYRON – CLAUSIUS EQUATION	5-2-24	24	lecture
Day22	THERMODYNAMIC DERIVATION OF LAWS OF MASS ACTION , VANT'S HOFF ISOTHERM AND ISOCHORE	6-2-24	25	lecture
Day23	FUGACITY AND ACTIVITY CONCEPTS.	7-2-24	25	lecture
Day24	NUMERICAL PROBLEM	8-2-24	23	lecture
Day25	**TEST**	10-2-24	22	Test
DAY 26	**CHEMICAL KINETICS – INTRODUCTION**	12-2-24	21	lecture
DAY 27	**EFFECT OF TEMERATURE ON THE RATE OFREACTION – TEMPERATURECOEFFICIENT**	13-2-24	20	lecture
DAY28	**THEORIES OF REACTION RATE – COLLISION THEORYAND**	14-2-24	22	lecture
DAY29	**THIRD ORDER REACTION WITH EQUAL CONCENTRAION ,OHS & EX**	16-2-24	23	lecture
DAY 30	**NUMBRICAL PROBLEM**	15-2-24	24	lecture
DAY31	TEST	16-2-24	23	Test

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Class – B.Sc. III

Subject-chemistry

PAPER – INORGANIC CHEMISTRY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	**Study of F-block Elements- INTRODUCTION**	17-2-24	24	lecture
Day2	Lanthanides :- Introduction iii Electronic configuration	20-2-24	23	lecture
Day3	Occurrence IV) Separation of Lanthanides :- i) Bulk separation methods	21-2-24	22	lecture
Day4	Actinides :- i) Introduction	22-2-24	21	lecture.
Day5	Electronic configuration	23-2-24	20	lecture
Day6	General Methods of preparation :- a) Neutron capture followed by β-decay	24-2-24	22	lecture.
Day7	Accelerated projectile bombardment method	26-2-24	23	lecture.
Day10	c) Heavy-ion bombardment method	27-2-24	24	lecture
Day 11	IUPAC Nomenclature of the Super Heavy Elements with atomic numbers (Z) greater than 100	28-2-24	25	lecture.
Day 12	TEST	29-2-24	23	Test
Day 13	**Metals and Semiconductors-** Introduction.	1-3-24	22	lecture.
Day14	Properties of metallic solids Theories of bonding in metal.	2-3-24	21	lecture.
Day15	Free electron theory , Molecular orbital theory (Band theory)	4-3-24	20	lecture.
Day16	Classification of solids as conductor, insulators and semiconductors on the basis of band theory	5-3-24	22	lecture.

	Semiconductors, b) Applications of semiconductors	6-3-24	23	lecture
5	Superconductors : a) Ceramic superconductors - Preparation and structures of mixed oxide $YBa_2Cu_3O_{7-x}$ b) Applications of superconductors.	7-3-24	24	lecture
Day16	**TEST**	8-3-24	23	Test
Day17	**Structural Chemistry.** Structural study of following compounds.	9-3-24	22	lecture.
Day18	i) Diborane, ii) Borazine, Xenon compounds -- XeF_2, XeF_4, XeO_4 (w.r.t. VBT only.)	11-3-24	21	lecture
Day19	Structural study of Oxides of Sulphur and Phosphorous.	12-3-24	20	lecture
Day20	Oxides of Sulphur : SO_2 and SO_3	13-3-24	19	lecture
Day21	ii) Oxides of Phosphorous : P_4O_6 and P_4O_{10}	14-3-24	17	lecture
Day22	**Corrosion and Passivity. Corrosion** :- Introduction	15-3-24	18	lecture
Day23	Types of corrosion.	16-3-24	20	lecture
Day24	Electrochemical theory of corrosion	18-3-24	21	lecture
Day25	Factors affecting the corrosion	19-3-24	20	lecture
DAY 26	Methods of protection of metals from corrosion	20-3-24	21	ICT
DAY 27	**Passivity** :- Definition	21-3-24	22	lecture
DAY28	Types of passivity	22-3-24	23	lecture
DAY29	Oxide film theory. Application of passivity.	23-3-24	24	lecture
DAY 30	**Organometallic Chemistry.** Introduction - Definition	24-3-24	23	lecture.
DAY31	Nomenclature of organometallic compounds	25-3-24	22	lecture
DAY32	Synthesis and structural study of alkyl and aryl compounds of Li, Be and Al.	26-3-24	20	lecture.
DAY33	Mononuclear carbonyl and nature of bonding in simple metal carbonyls	27-3-24	21	lecture.
		28-3-24	22	lecture.

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Class – B.Sc. III

Subject-chemistry

PAPER – ORGANIC CHEMISTRY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day1	**Heterocyclic compounds-** Introduction and classification	1-1-24	23	lecture
Day2	Pyrrole: 1,2,1- Methods of synthesis :i) From acetylene.	2-1-24	24	lecture
Day3	From furan, From succinimide.	3-1-24	22	lecture
Day4	Physical properties. Reactions of pyrrole	4-1-24	20	lecture
Day5	Basic character. Acidic character	5-1-24	21	lecture
Day6	Electrophilic substitution with general mechanism.	6-1-24	22	lecture
Day9	Chemical reactions :i) Reduction. ii) Oxidation.	8-1-24	23	lecture
Day10	Nitration, sulphonation and halogenation	9-1-24	24	lecture
Day 11	Friedel Craft's reaction, coupling reaction.	10-1-24	23	lecture
Day 12	Pyridine : Methods of synthesis from piperidine.	11-1-24	22	lecture
Day 13	From acetylene and hydrogen cyanide.	12-1-24	21	lecture
Day14	Physical properties	13-1-24	20	lecture
Day15	Chemical reactions :i) Basic character	15-1-24	23	lecture
Day16	Electrophilic substitution. Nucleophilic substitution - General mechanisms. Reactions with sodamide, sodium hydroxide and n-butyl lithium.	16-1-24	24	lecture
Day18	Quinoline. Synthesis - Skraup's synthesis. Physical properties	19-1-24	22	lecture

	Electrophilic substitution reactions - Nitration and sulphonation.	22-1-24	21	ICT
16	Nucleophilic substitution reactions - Reactions with sodamide, alkylation and arylation	2-1-24	20	lecture
Day17	Reduction.	25-1-24	19	lecture
Day18	test	26-1-24	20	Test
Day19	**Carbohydrates**-Introduction	29-1-24	21	lecture
DAY20	Classification and nomenclature	30-1-24	22	lecture
Day21	Monosaccharide D-glucose - Open chain structure	31-1-24	23	lecture
Day22	Chain lengthening of Aldoses - Kiliani synthesis	31-1-24	24	lecture
Day23	Chain shortening of Aldoses - Wohl's degradation	1-2-24	21	lecture
Day24	Interconversion of glucose and fructose.	2-2-24	22	lecture
Day25	Configuration of D-glucose from D-arabinose.	3-2-24	23	lecture
DAY 26	Objection against open chain structure of D-glucose	5-2-24	24	lecture
DAY 27	Mutarotation with mechanism	6-2-24	24	lecture
DAY28	Ring structure of D-glucose - Determination of no of oxy by, i) Methylation method	7-2-24	22	lecture
DAY29	Periodic acid treatment method, X - ray analysis	8-2-24	21	lecture
DAY 30	Disaccharides - Introduction, sucrose and lactose - Sources, structural formulae and uses.	10-2-24	25	lecture
DAY31	Polysaccharides - Introduction, starch - sources, structural formulae and uses	12-2-24	23	lecture
DAY32	Test	13-2-24	22	Test
DAY33	**Vitamins and Hormones**-General	14-2-24	20	lecture

	idea of vitamins, structure and synthesis of vitamin A		20	
	General idea of hormones, structure and synthesis of Adrenaline and Thyroxin.	15-2-24	22	lecture
	Pharmaceuticals-Introduction	16-2-24	21	lecture
	Qualities of ideal drug	17-2-24	20	lecture
	Methods of classification of drugs - Classification based on the therapeutical action	20-2-24	19	lecture
DAY20	Brief idea of penicillin-G	21-2-24	22	lecture
DAY39	Synthesis and uses of the following drugs :- i) Antimalarials - Pthalein	22-2-24	23	lecture
DAY40	Antituberculars - Isoniazide and Ethambutol.	23-2-24	24	lecture
DAY41	C. N. S. drugs - Phenobarbitone ii) Antidiabetics - Tolbutamide	24-2-24	25	lecture
DAY42	Antiinflammatory drugs - Ibuprofen	26-2-24	25	lecture
DAY43	Antibiotic - Chloromycetin	27-2-24	22	lecture
DAY43	TEST	28-2-24	23	Test
DAY44	**Synthetic dyes.**- Introduction, Qualities of good dye	29-2-24	20	lecture
DAY45	Classification based on constitution and methods of applications	1-3-24	21	lecture
DAY46	Witt's theory - Colour and constitution	2-3-24	22	lecture
DAY47	Synthesis of Orange IV, Malachite green, phenolphthalein	3-3-24	23	lecture
DAY48	TEST	4-3-24	24	Test
DAY49	**Agrochemicals**.- General idea of agrichemicals including pyrethroides	5-3-24	22	lecture
DAY50	Synthesis and uses of the following agrochemicals	6-3-24	21	lecture
DAY51	Indole3-acetic acid, Monocrotophos	7-3-24	20	lecture
DAY52	Methoxychlor, Ethephon, Carbaryl, RAVIDAZOL	8-3-24	21	lecture
DAY53	TEST	11-3-24	23	Test

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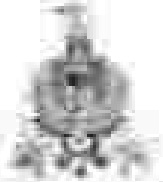

Class – B.Sc. III

Subject-chemistry

PAPER – ANALYTIC AND INDUSTRIAL ORGANIC CHEMISTRY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	**Soaps and Detergents**-Soap Raw materials.	1-1-24	24	lecture
Day2	Types of soaps, Manufacture of soap - Hot process	2-1-24	22	lecture
Day3	Cleaning action of soaps. , Detergents	3-1-24	21	lecture
Day4	Raw materials. , Types of detergents - Cationic, anionic, amphoteric, neutral detergents	4-1-24	20	lecture
Day5	Preparation of liquid and detergent	5-1-24	19	lecture
Day6		6-1-24	20	lecture
Day9	Comparison between soaps and detergents.	7-1-24	22	lecture
Day10	**TEST**	8-1-24	23	TEST
Day 11	**Synthetic polymers.**- Introduction. Classification.	9-1-24	24	lecture
Day 12	According to origin, composition	10-1-24	25	lecture
Day 13	method of preparation and general physical properties.	11-1-24	23	lecture.
Day13	Classification based upon structure	12-1-24	21	lecture.
Day12	Process of addition (polymerisation) - free radical polymerisation of alkenes and Dienes	13-1-24	20	lecture.
Day14	Ionic polymerisation Ziegler - Natta polymerisation	17-1-24	22	lecture.
Day16	Methods of preparation and uses of	18-1-24	23	lecture.

				lecture
Day15	Natural rubber : General idea and vulcanisation.	19-1-24	20	
Day16	Synthetic rubbers : Synthesis and uses of -Polychloropreene, Buna rubber(Buna N and Buna S.	20-1-24	21	lecture
Day17	TEST	23-1-24	22	Test
Day18	**Sugar and Alcohol Industry**-Manufacture of raw cane sugar	22-1-24	23	lecture
Day19	Refining of raw sugar. . White sugar	23-1-24	24	lecture
Day20	By-products of sugar industry.	29-1-24	22	lecture
Day21	Manufacture of ethyl alcohol from molasses	30-1-24	20	lecture
Day22	Rectified spirit. Denatured spirit absolute alcohol and power alcohol	31-1-24	21	lecture.
Day23	By-products of alcohol industry.	1-2-24	20	lecture
Day24	TEST	2-2-24	19	Test
Day25	**Green Chemistry**-Introduction : Twelve principles of green chemistry	3-2-24	20	lecture
DAY 26	Zeolites - Friedel Craft's alkylation and acylation, oxidation of benzene to phenol and benzoquinone	5-2-24	21	lecture.
DAY 27	Reduction of benzoquinone to hydroquinone	6-2-24	22	lecture
DAY28	Biocatalytic reaction - Hydroxylation and oxidation using enzymes.	7-2-24	23	lecture.
DAY29	Introduction to microwave assisted reactions.	8-2-24	20	lecture
DAY 30	**IONIC LIQUIDS**	9-2-24	24	lecture
DAY31	TEST	12-2-24	20	Test
DAY32	**Chromatography**-Introduction. General principles.	13-2-24	21	lecture.
DAY33	Classification.	14-2-24	24	lecture
DAY34	Study of following chromatographic techniques with reference to principle, methodology and applications.	15-2-24	22	lecture
DAY35	Paper chromatography, Column chromatography.	16-2-24	23	lecture.

DAY35	Thin layer chromatography . Gas chromatography	17-2-24	24	lecture
		20-2-24	20	Test
DAY37	TEST	21-2-24	21	lecture
DAY38	SYNTHETIC REAGENT - INTRODUCTION	22-2-24	22	lecture
DAY39	SODIUM BOROHYDRIDE	23-2-24	23	lecture
DAY40	LITHIUM ALUMINIUM HYDRIDE	24-2-24	24	lecture
DAY41	OSMIUM TETROXIDE	26-2-24	26	lecture
DAY42	1,3 DITHINE	27-2-24	27	lecture
DAY43	SELENIUM DIOXIDE	28-2-24	28	Test
DAY 44	TEST			

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Class – B.Sc. I

Semester –First

Subject-Microbiology

Paper – Introduction to Microbiology and Microbial diversity

Day's	Task to be completed	Date	Attendance	Methodology
Day 1	Contribution of Robert Hook, Antony van leeuwenhoek	1-8-23	35	ICT
Day2	Theory of spontaneous generation : Francesco Redi, John Needham	2-8-23	30	ICT
Day3	Friedrich Schroder , Van Dunch	3-8-23	35	ICT
Day4	John Tyndall , Louis Pasteur	4-8-23	25	ICT
Day5	Golden era of Microbiology (1857-1914) –A Germ Theory of fermentation	5-8-23	31	ICT
Day6	III Germ theory disease	7-8-23	35	ICT
Day7	Contribution of Martinus Beijerinck, Sergei Winogradsky ,	8-8-23	35	ICT
Day 8	Joseph Lister and Dmitri Ivanovski	9-8-23	35	ICT
Day9	Edward Jenner, Ilya Mechnikoff	10-8-23	25	ICT
Day10	Selman Waksman , Alexander Fleming in development of applied microbiology	11-8-23	35	ICT
Day11	**MCQ Test**	12-8-23	30	Writing
Day12	National institute related to microbiology in India – NIV , NARI, NCCS	14-8-23	35	ICT
Day13	CCMB, Serum institute of India , Vasantdada Sugar institute	17-8-23	35	ICT
Day14	**Test**	18-8-23	30	Writing
Day15	General Characteristics, occurrence and economic importance of microorganisms – Acellular viruses (definition and example of Phytophage)	19-8-23	33	Lecture
Day16	Zoophage and Bacteriophage	21-8-23	35	Lecture
Day17	Cellular – Bacteria (Size ,Shape and Arrangement)	23-8-23	32	Lecture
Day18	Mycoplasma	24-8-23	35	Lecture
Day19	Rickettsia	25-8-23	30	Lecture
Day20	Actinomycetes	26-8-23	32	Lecture
Day21	Archaebacteria	28-8-23	35	Lecture
Day22	Algae	29-8-23	34	Lecture

Day23	Fungi	31-3-23	35	Lecture
Day24	Protozoa	1-4-23	35	Lecture
Day25	50 Mark test	3-4-23	30	Written
Day26	Difference between prokaryotic and eukaryotic cell	4-4-23	35	Lecture
Day27	Assignment for unit	5-4-23	28	Written
Day28	Bacterial Taxonomy – Basic principles of nomenclature	6-4-23	35	Lecture
Day29	Critical for bacterial classification and identification	8-4-23	40	Lecture
Day30	Morphology ,Culture ,Biochemical and molecular by 16S r RNA gene sequencing	9-4-23	35	Lecture
Day31	% G+C(ratio)diversity content	11-4-23	35	Lecture
Day32	MCQ test	12-4-23	35	Lecture

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Class – B.Sc. I

Semester –First

Subject-Microbiology

Paper II- Cell cytology and Microbial Techniques

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	Structure, composition and function of bacteria	13-1-21	25	ICT
Day2	Cell wall Gram positive bacteria	15-1-21	35	ICT
Day3	Cell wall Gram negative bacteria	16-1-21	35	ICT
Day4	Definitions of wholeprotein and protoplast	18-1-21	35	ICT
Day5	Cell membrane – fluid mosaic model	20-1-21		ICT
Day6	Cytoplasm - ribosome, mesosome and nucleoid	21-1-21	35	ICT
Day7	Ultrastructure of endospore	23-1-21	35	ICT
Day8	Capsule and slime layer	25-1-21	35	ICT
Day9	Flagella and pili	26-1-21	33	ICT
Day10	MCQ test	27-1-21	32	Writing
Day11	Microscope—Magnification, numerical aperture and resolving power	29-1-21	35	Lecture
Day12	Principle, working and application of compound microscope	30-1-21	30	Lecture
Day13	Electron microscope (scanning electron microscope SEM)	1-2-21	35	Lecture
Day14	Transmission electron microscope(TEM)	4-2-21	31	Lecture
Day15	Definition, types of stain	5-2-21	35	Lecture
Day16	Different methods of staining - monochrome	6-2-21	35	Lecture
Day17	Negative staining	7-2-21	35	Lecture
Day18	Differential staining	8-2-21	35	Lecture

Day19	Special staining - cell wall staining (by Chances method)	[illegible]	35	Lecture
Day20	Capsule staining (by Manevals method)	[illegible]	35	Lecture
Day21	Test	[illegible]	29	Writing
Day22	Definition of: sterilization, disinfection, antiseptic, germicide, microbistatics and sepsis	[illegible]	35	Lecture
Day23	Sterilization by physical agents - Temperature (dry heat and moist heat)	[illegible]	35	Lecture
Day24	Radiation - U.V rays γ-rays and membrane filtration	[illegible]	35	Lecture
Day25	Class	[illegible]		Lecture
Day26	Phenol and phenolic compound, ethyl alcohol	[illegible]	35	Lecture
Day27	Halogens- chlorine and iodide	[illegible]	35	Lecture
Day28	Heavy Metals, copper and mercury	[illegible]	33	Lecture
Day29	Gaseous agents - Ethylene oxide, beta - propiolactone, formaldehyde	[illegible]	35	Lecture
Day 30	Assignment for unit	[illegible]	28	Writing

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Class – B.Sc. I

Semester –II

Subject-Microbiology

Paper III- Microbial Metabolism and Cultivation

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	a) Carbohydrates b) Proteins	1-1-24	35	Lecture
Day2	c) Lipids	2-1-24	35	Lecture
Day3	DNA	3-1-24	35	Lecture
Day4	RNA	4-1-24	33	Lecture
Day5	First and Second law of Thermodynamics	5-1-24	32	Lecture
Day6	**Test**	6-1-24	35	Writing
Day7	Definition of Gibbs free energy, enthalpy and entropy.	8-1-24	35	Lecture
Day8	High energy compounds and structure of ATP	9-1-24	34	Lecture
Day9	Definition of Metabolism, Anabolism and Catabolism	10-1-24	35	Lecture
Day 10.	Definition: apoenzyme, coenzymes, cofactors, prosthetic group and active site.	11-1-24	35	Lecture
Day11	**MCQ test**	12-1-24	35	Writing
Day12	Types of enzymes - extracellular and intracellular	15-1-24	35	ICT
Day13	constitutive and inducid enzyme	16-1-24		ICT
Day14	iii) Mechanism of enzyme action: Lock and key hypothesis	17-1-24	35	ICT
Day15	induced fit hypothesis	18-1-24	35	ICT
Day16	EMP pathway	19-1-24	34	ICT
Day17	Fate of Pyruvate- Aerobic	20-1-24	35	ICT
Day18	Anaerobic (Ethanol)	22-1-24	34	ICT
Day19	Microaerophilic (Lactic acid)	24-1-24	35	ICT

Day20	i) Nutritional requirements of microorganisms	27-1-24	35	Lecture
Day21	Nutritional types of Microorganisms based on Carbon and Energy source	29-1-24	35	Lecture
Day22	**Test**	30-1-24	35	Writing
Day23	**Culture Media**	31-1-24	35	Writing
Day24	Definitions with example- Living media and Non-living media	1-2-24	35	Lecture
Day25	Natural, Synthetic	2-2-24	35	Lecture
Day26	Semi-synthetic, Differential	3-2-24	35	Lecture
Day27	Enriched and Selective	5-2-24	35	Lecture
Day28	Serial dilution	6-2-24	35	Lecture
Day29	Streak Plate, Spread Plate and Pour Plate technique	7-2-24	35	Lecture
Day30	**Test**	8-2-24	35	Writing

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Class – B.Sc. I

Semester –II

Subject-Microbiology

PaperIV –Applied microbiology

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	Water Microbiology a) Sources of Microorganisms in water	10-2-24	35	Lecture
Day2	fecal pollution of water and its indicator	12-2-24	36	Lecture
Day3	routine bacterial-gical analysis of water for detection and differentiation of coliforms – Qualitative (presumptive, confirmed and completed)	13-2-24	35	Practical & Lecture
Day4	IMViC and Eijkman test	15-2-24	30	Lecture
Day5	Quantitative Test – MPN	15-2-24	28	Lecture
Day6	Municipal water purification process: Sedimentation, Filtration and Disinfection	16-2-24	35	Lecture
Day7	**Test**	17-2-24	32	Writing
Day 8	Sewage Microbiology: a) Definition, Types and Microflora of sewage	20-2-24	34	ICT
Day9	Definition of DO, BOD and COD	21-2-24	31	ICT
Day10	Treatment of Sewage – Primary (Physical)	22-2-24	35	ICT
Day11	Secondary (Chemical)	23-2-24	28	ICT
Day12	Tertiary (Biological) methods	24-2-24	34	ICT
Day13	Definitions:- Infection, virology, microbial agents, disease, pathogen, incubation period, illness, pathogenicity.	26-2-24	35	ICT
Day14	virulence, morbidity rate, mortality rate, opportunistic pathogens, carriers, host, epidemiology, prophylaxis	27-2-24	32	ICT
Day15	**MCQ test**	28-2-24	35	Writing
Day16	pandemic & epizootic	29-2-24	34	Lecture

Day17	Types of infections: Primary, Secondary	1-3-24	35	Lecture
Day18	acute, chronic, reinfection	2-3-24	35	Lecture
Day19	cross infection, Mixed infection, congenital	4-3-24	35	Lecture
Day20	local, systemic and generalized	5-3-24	35	Lecture
Day21	**Test**	6-3-24	35	Seminar
Day22	Mode of transmission of diseases: 1) Inoculation 2) Ingestion	7-3-24	35	Lecture
Day23	3) Contact 4) Inhalation	8-3-24	35	Lecture
Day24	Prevention and control measures for: 1) Water and food borne diseases	11-3-24	35	Lecture
Day25	2) Air borne diseases	12-3-24	35	Lecture
Day26	3) Vector borne diseases	13-3-24	35	Lecture
Day27	4) Diseases transmitted through physical contact	14-3-24	35	Lecture
Day28	**Test**	15-3-24	35	Valuation

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Class- B.Sc. II

Semester – IV

Subject-Microbiology

Paper VII(Immunology & Medical Microbiology)

Day's	Task to be completed	Date	Attendance	Methodology
Day1	**Immunity, Antigen and Antibody**	1-1-24	20	Lecture
Day2	**1. Immunity** – Definition and concept	2-1-24	20	Lecture
Day3	a. Innate immunity – Definition, Levels of innate immunity – individual, racial and species immunity	3-1-24	18	Lecture
Day4	b. Acquired immunity– definition,	4-1-24	20	Lecture
Day5	types-Active& passive	5-1-24	18	Lecture
Day6	Mechanism of innate immunity-mechanical	6-1-24	19	Lecture
Day7	chemical, biological barriers(role of normal flora	8-1-24	20	Lecture
Day8	cells of innate immunity and their role).	9-1-24	20	Lecture
Day9	inflammation and fever	10-1-24	20	Lecture
Day10	b. Acquired immunity– definition, types-Active& passive	11-1-24	19	Lecture
Day11	ASSIGNMENT	12-1-24	20	Writing
Day12	TEST	13-1-24	17	Writing
Day13	**2.Antigen** a. definition, concept of hapten, antigenic determinant	16-1-24	20	ICT
Day14	b. Types of antigen	17-1-24	20	ICT
Day15	c. factors affecting antigenicity	18-1-24	18	ICT
Day16	**3. Antibody**(immunoglobulin) a.Historical perspective-Immunity and concept of immunoglobulin	19-1-24	20	Lecture
Day17	b. Basic structure of antibody(immunoglobulin)	20-1-24	19	Lecture
Day18	c. Classes of immunoglobulins, physicochemical& biological properties and functions of immunoglobulins.	23-1-24	20	Lecture

Day19	TEST			
Day20	**Antigen Antibody reactions and Medical Microbiology** **A. Antigen Antibody reactions** 1. Purpose of antigen-antibody reactions	24-1-24	18	Meeting
Day21	2. General features of antigen-antibody reactions	27-1-24	20	ICT
Day22	3. Measurement of antigen-antibody reactions	29-1-24	20	ICT
Day23	4. Mechanism of antigen-antibody reactions	30-1-24	20	ICT
Day24	5. Types of antigen – antibody reactions: Agglutination, precipitation, flocculation.	31-1-24	20	ICT
Day25	TEST	1-2-24	20	ICT
Day26	**B. Medical Microbiology:** 1. Collection, Handling and transportation of Specimen.	2-2-24	17	Meeting
Day27	2. Microbial Diseases Bacterial: Enteric fever	5-2-24	20	Lecture
Day28	3. Fungal: Candidiasis	6-2-24	18	Lecture
Day29	4. Viral: Dengue.	7-2-24	20	Lecture
Day30	TEST	8-2-24	20	Lecture
			19	Meeting

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Class- B.Sc. II

Semester – IV

Subject-Microbiology

Paper VIII – (Introduction to Industrial Microbiology)

Day's	Task to be completed	Dated on	Attendance	Methodology
Day1	**Industrial Microbiology**	10-2-24	18	Lecture
Day2	**A. fermentation**: Basic Concept, Types-	12-2-24	17	Lecture
Day3	Surface Culture Submerged Culture	13-2-24	19	Lecture
Day4	Batch culture	14-2-24	20	Lecture
Day5	Continuous culture (Chemostat & Turbidostat)	15-2-24	20	Lecture
Day6	Dual fermentation	16-2-24	20	Lecture
Day7	Multiple fermentation	17-2-24	20	Lecture
Day8	TEST	20-2-24	18	Writing
Day9	Multiple fermentation: Design of typical Fermenter	21-2-24	20	ICT
Day10	Bioreactor: Parts and their functions	22-2-24	17	ICT
Day11	TEST	23-2-24	20	Writing
Day12	ASSIGNMENT	24-2-24	18	Writing
Day13	REVISION	26-2-24	19	Writing
Day14	**B. Fermentation media:** i Media for Industrial Fermentations	27-2-24	20	Lecture
Day15	ii Media Components and Optimization	28-2-24	20	Lecture
Day16	iii Use of Waste as a fermentation Media	29-2-24	20	Lecture
Day17	iv Inoculum and Production media	1-3-24	20	Lecture
Day18	ASSIGNMENT	2-3-24	20	Writing
Day19	TEST	4-3-24	20	Writing

Day20	**Screening, Inoculum Development and Scale up** **A.Screening**: Primary and Secondary	5-3-24	20	ICT
Day21	Strain Improvement	6-3-24	20	ICT
Day22	Preservation of industrially important microorganisms	7-3-24	20	ICT
Day23	B. Inoculum Development	9-3-24	18	ICT
Day24	C.Scale up of Fermentation	11-3-24	20	ICT
Day25	ASSIGNMENT	12-3-24	20	Writing
Day26	TEST	13-3-24	18	Writing
Day27	**D.Specific fermentations:** i. Penicillin	14-3-24	20	Lecture
Day28	ii. Alcohol	15-3-24	18	Lecture
Day29	iii. SCP	7-3-24	20	Lecture
Day30	TEST	8-3-24	19	Writing

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SUBJECT MICROBIOLOGY

SEMESTER III B.Sc. II

PAPER V BACTERIAL CYTOLOGY PHYSIOLOGY & MECHANISM

Day's	Task to be completed	Duration	Attendance	Methodology
Day1	Chemical composition of cell membrane	4-8-22	24	Lecture
Day2	Structure and function cell membrane	5-8-22	19	Lecture
Day3	Transport across cell membrane - simple diffusion facilitated diffusion	6-8-22	20	Lecture
Day4	active transport and group translocation	8-8-22	17	Lecture
Day5	Flagella - mechanism of movement and taxis behavior	9-8-22	20	Lecture
Day6	Chromosom vesicle , gas vacuoles	11-8-22	20	Lecture
Day7	Magnetosome and carboxysome and their function	12-8-22	18	Lecture
Day8	Nitrogenous and non nitrogenous reserve food material and their role	13-8-22	20	Lecture
Day9	Sporulation and germination	15-8-22	18	Lecture
Day10	Definition of growth , generation time	16-8-22	18	Lecture
Day11	Growth rate	18-8-22	20	Lecture
Day12	Growth phase	19-8-22	20	Lecture
Day13	Concept of diauxic growth	20-8-22	16	Lecture
Day14	Continual and synchronous growth	22-8-22	18	Lecture
Day15	Acidophiles, basophiles , neutrophiles	23-8-22	20	Lecture
Day16	TEST	25-8-22	19	Test
Day17	Psychrophiles , mesophiles	26-8-22	20	Test
Day18	thermophiles	27-8-22	18	Test
Day19	Oxygen - aerobic and anaerobic	29-8-22	20	Test
Day20	Facultative anaerobic and microaerophilic	30-8-22	20	Test
Day21	Definition of osmosis , osmoregulation	31-8-22	18	Test
Day22	Osmotic balance	1-9-22	20	Test
Day23	osmophiles and halophiles	2-9-22	20	Test
Day24	Heavy metal	3-9-22	20	Lecture
Day25	ASSIGNMENT OF UNIT	5-9-22	20	Lecture
Day26	Mode of ATP generation , Substrate level phosphorylation	6-9-22	19	Lecture
Day27	Oxidative phosphorylation	8-9-22	20	Lecture
Day28	Photophosphorylation	9-9-22	20	Lecture
Day29	ED pathway	10-9-22	19	Lecture
Day30	Nomenclature and classification enzyme as per E.B.	12-9-22	19	Lecture

51	Effect of factor on enzyme activity	[illegible]	2	Lecture
52	TEST	[illegible]	1	Writing

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Class – B.Sc. II

Semester –III

Subject-Microbiology

Paper VI- Bacterial Genetics

Day's	Task to be completed	Dated on	Attendance	Methodology
Day 1	Griffith Experiment	16-3-23	20	Lecture
Day2	Avery ,Macleod and McCarty's experiment	18-3-23	19	Lecture
Day3	Hershey and Chase experiment	20-3-23	20	Lecture
Day4	Watson and Crick's model of DNA	21-3-23	18	Lecture
Day5	A,B,C and Z form of DNA	23-3-23	19	Lecture
Day6	Modes of replication	25-3-23	18	Lecture
Day7	Meselson and Stahl's experimental proof of semi conservative replication	26-3-23	17	Lecture
Day 8	Enzymes involved in replication	27-3-23	18	Lecture
Day9	Mechanism of DNA replication	29-3-23	19	Lecture
Day10	Definations and concepts of Gene , Genome , Genotype , Phenotype Cistron, Recon	30-3-23	17	Lecture
Day11	Muton Split gene concept of exon and exon	31-3-23	18	Lecture
Day12	Defination and properties of genetic code	5-10-23	20	Lecture
Day13	Basic concept of transcription and translation	4-10-23	20	Lecture
Day14	Test	5-10-23	17	Writing
Day15	Definition of mutation	6-10-23	18	ICT
Day16	Mutagen –physical and chemical Mutagens	7-10-23	17	ICT
Day17	Base pair substitution –transition and transversion	9-10-23	18	ICT
Day18	Missense mutation	10-10-23	20	ICT
Day19	Nonsense mutation	11-10-23	19	ICT
Day20	Neutral mutation	12-10-23	16	ICT
Day21	Silent mutation	13-10-23	19	ICT

Frame shift mutation	15	10.33	TCT
TEST	16	10.35	Vinay

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Class- B.Sc. III

Semester – V

Subject – Microbiology

Paper – IX (Virology)

		Dated on	Completed	Methodology
	Link to be completed	1-2-25	07	Lecture
[illegible]	General properties of virus	2-2-25	07	Lecture
[illegible]	Structure of virus	3-2-25	07	Lecture
[illegible]	Viroids	4-2-25	07	Lecture
[illegible]	Prions	6-2-25	07	Lecture
[illegible]	Viral classification on the basis of Type revision bac. LHT system as per international committee	7-2-25	07	Writing
[illegible]	**MCQ test**	8-2-25	07	ICT
[illegible]	T4 Bacteriophage – Lytic cycle	9-2-25	07	ICT
[illegible]	Temperate phage	10-2-25	07	ICT
[illegible]	Lysogeny of λ phage	11-2-25	07	Writing
[illegible]	**Write a Assignment on unit**	12-2-25	07	Lecture
[illegible]	Reproduction of animal viruses: Adeno virus	13-2-25	07	Lecture
[illegible]	Reproduction of animal viruses: Influenza virus	15-2-25	07	Lecture
[illegible]	Types of cancer	16-2-25	07	Lecture
[illegible]	Characteristic of cancerous cell	17-2-25	07	Lecture
[illegible]	Hypothesis of cancer genesis: mutation	18-2-25	07	Lecture
[illegible]	Viral gene and defective genomics	20-2-25	07	Writing
[illegible]	**TEST**	21-2-25	07	Lecture
[illegible]	Plant virus diseases	24-2-25	07	Lecture
[illegible]	Tobacco mosaic virus	25-2-25	07	Lecture
[illegible]	Cauliflower mosaic virus	27-2-25	07	Lecture
[illegible]	Prevention of plant viral disease	28-2-25	06	Lecture
[illegible]	Control of plant viral disease	29-2-25	07	Lecture
[illegible]	**TEST**	3-3-25	07	Writing
[illegible]	Isolation of virus	4-3-25	07	Lecture
[illegible]	Cultivation of virus	5-3-25	06	Lecture
[illegible]	Purification of virus	6-3-25	07	Lecture
[illegible]	Enumeration of virus	7-3-25	07	Lecture
[illegible]	One step growth experiment	8-3-25	07	Lecture
[illegible]	**Assignment on unit**	9-3-25	07	Writing
[illegible]	**TEST**	13-3-25	07	Writing

01	Revised	11-3-23	63	Good
02	Typed	13-3-23	63	Nothing

Utrade P.N.

NAME OF HOD

SIGN OF HOD
Head of the Department
Microbiology

Principal
Hansraj Chandaben College
Vaijapur Tal.Dist.Sambhajinagar

SIGNATURE OF PRINCIPAL

Hemuji Chandra College, Shrigonda (Rd.)

Class- B.Sc. III

Subject – Microbiology

Semester V

Paper No X Agricultural Microbiology

Day's	Task to be completed	Date/Day	Attendance	Methodology
Day1	Introduction of soil , definition of soil formation of soil	12-9-23	67	Lecture
Day2	Types structure and properties of soil	15-9-23	67	Lecture
Day3	Soil as an ecosystem , rhizosphere phyllosphere	18-9-23	67	Lecture
Day4	Soil microorganisms types and their role in soil fertility	19-9-23	67	Lecture
Day5	Humus	20-9-23	67	Lecture
Day6	Interaction in soil	21-9-23	67	Lecture
Day7	**Mcq test**	22-9-23	67	Writing
Day8	Carbon cycle	25-9-23	67	ICT
Day9	Nitrogen cycle	26-9-23	65	ICT
Day10	Sulphur cycle	27-9-23	67	ICT
Day11	Phosphorous cycle	28-9-23	66	ICT
Day12	Compost production with reference to organic waste	29-9-23	67	ICT
Day13	Types of microorganisms and factor effecting aeration	3-10-23	67	Lecture
Day14	C:N:P ratio moisture content , temperature pH and period of composting	4-10-23	67	Lecture
Day15	Green manure, farmyard manure	5-10-23	67	Lecture
Day16	Fossapost , Vermicompost	6-10-23	66	Lecture
Day17	Biodegradation of xenobiotic, heterocyclone	7-10-23	67	Lecture
Day18	Biodegradation of lignin pectin and pesticides	9-10-23	67	Lecture
Day19	Common Symptoms produced by pathogen	10-10-23	67	Lecture
Day20	Mode of transmission of plant disease only spot on permanent xanthomonas viroposita	11-10-23	67	Lecture
Day21	Whip smut of sugarcane , soft rot of potato	12-10-23	66	Test
Day22	**Write assignment on unit**	13-10-23	67	Writing
Day23	Control measure of plant disease	14-10-23	67	Lecture
Day24	**TEST**	16-10-23	67	Writing
Day25	Biofertilizer Azo and Rhizo and PSB	17-10-23	65	Lecture
Day26	Production and application	18-10-23	67	Lecture
Day27	Biopesticides – bacillus thuringiensis trichoderma viride abbreviamphe	19-10-23	67	Lecture
Day28	Genetical modified crop	20-10-23	67	Lecture

day29	Genetical modified crop and example	21-10-21	07	Lecture
day30	Viral pesticides concept	23-10-21	07	Lecture
day31	Viral pesticide application	25-10-21	07	Lecture
day32	Test	26-10-21	04	Waiting

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Hemaji Chandsile College

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Class- B.Sc. III

Subject - Microbiology

Semester V

Paper XI Immunology

Day's	Task to be completed	Dated on	Attendance	Methodology
Day1	Structure and function of lymphoid organ Primary organ Thymus , bone marrow	25-1-21	67	Lecture
Day2	Secondary lymphoid organs – spleen, lymph node and mucosa associated lymphoid tissue	25-2-21	67	Lecture
Day3	Classification of cell of immune system – lymphoid and myeloid cell	2-3-21	67	Lecture
Day4	Structure and function of lymphoid cell T Cell and T Cell subset	9-3-21	67	Lecture
Day5	NK Cell, B cell and dendritic cell	16-3-21	67	Lecture
Day6	Structure and function of myeloid cell - Granulocytes monocytes and macrophage	23-3-21	67	Lecture
Day7	**MCQ TEST**	30-3-21	67	Writing
Day8	Humoral mediated response cell involved and mechanism	6-4-21	67	Lecture
Day9	Cell mediated cell involve mechanism cytokines and their role	13-4-21	67	Lecture
Day10	Primary, secondary immune organs	20-4-21	67	Lecture
Day11	Production of monoclonal antibodies	27-4-21	67	Lecture
Day12	Application of monoclonal antibodies	4-5-21	67	Lecture
Day13	Diagnosis research and treatment	11-5-21	67	Lecture
Day14	**TEST**	18-5-21	67	Writing
Day15	Organization of MHC gene in man	25-5-21	67	Lecture
Day16	Classes of MHC molecules structure and their role	1-6-21	67	Lecture
Day17	HLA Typing	8-6-21	67	Lecture
Day18	Types of graft and its rejection	29-6-21	67	Lecture
Day19	**ASSIGNMENT ON UNIT**	6-7-21	67	Writing
Day20	Components of complement and their properties	13-7-21	67	Lecture
Day21	Activation of complement classical and Alternat pathway	20-7-21	67	Lecture
Day22	Biological effect of complement	27-7-21	67	Lecture
Day23	**TEST**	3-8-21	67	Writing
Day24	Hypersensitivity	10-8-21	67	Lecture

day25	Classification based time immediate and delayed hypersensitivity	20-9-23	07	Lecture
Day26	Anaphylaxis atopy , autohaemolytic anemia	3-10-23	07	Lecture
Day27	Arthus reaction serum sickness contact dermatitis allergy of infection , mechanism of autoimmunity	4-10-23	06	Lecture
Day28	Types of autoimmune disease , haemocytolytic organ specific non organ group system	5-10-23	07	Lecture
Day29	**TEST**	6-10-23	07	Solving question
Day30	ABO blood group system , Rh blood group system	7-10-23	07	practical
Day31	Blood transfusion reaction and its complication	9-10-23	07	Practical
Day32	**ASSIGNMENT ON UNIT**	10-10-23	06	Writing

Ghode P.M

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Tal-Kannad Dist-Aurangabad

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Hemaji Chandak College, Sholapur (M.S.)

Class- B.Sc. III

Subject - Microbiology

Semester V

Paper XII Industrial Microbiology

Day's	Task to be completed	Dated on	Attendance	Methodology
Day1	Food as a substrate for microorganisms	14-5-22	01	Lecture
Day 2	Food spoilage and food poisoning	23-5-22	01	Lecture
Day3	Food born disease	24-5-22	01	Lecture
Day4	Principle and method of food preservation	27-5-22	01	Lecture
Day 5	Food fermentation	31-5-22	01	Lecture
Day6	TEST	2-6-22	00	Writing
Day 7	Spoilage of milk	3-6-22	01	Lecture
Day8	Fermented dairy product cheese	7-6-22	01	Lecture
Day9	Yougurt	8-6-22	01	Lecture
Day10	ASSIGNMENT ON UNIT	9-6-22	01	Writing
Day11	Production of Sipunculida	13-6-22	00	Lecture
Day12	Production of Lysine	14-6-22	00	Lecture
Day13	Ruina product insulin	16-6-22	01	Lecture
Day14	Production vitamin b12	17-6-22	01	Lecture
Day15	TEST	20-6-22	01	Writing
Day16	Definition types of wine	21-6-22	01	Lecture
Day17	Production of white table wine and red table wine	23-6-22	01	Lecture
Day18	Post fermented spoilage of wine	24-6-22	01	Lecture
Day19	Microbial and non microbial spoilage of wine	27-6-22	01	Lecture
Day 20	Definition types of beer	28-6-22	01	Lecture
Day21	Production of lager beer and ale beer	30-6-22	01	Lecture
Day 22	MCQ TEST	1-7-22	01	Writing
Day 23	Downstream process - Filtration centrifuge flotation	4-7-22	01	Lecture
Day 24	Flocculation solvent extraction	5-7-22	01	Lecture
Day 25	Concentration, centrifugation	7-7-22	01	Lecture
Day 26	Crystallization, distillation, Adsorption chroma	8-7-22	01	Lecture
Day 27	Precipitation and chromatography	11-7-22	01	Lecture

	Test for sterility, pyrogenicity	6-3-23	07	ICT
	Allergy, carcinogenicity	7-3-23	09	ICT
	Toxicity for pharmaceutical and health care and food product	8-3-23	07	ICT
	TEST	10-3-23	07	Writing
	ASSIGNMENT ON UNIT	11-3-23	07	Writing

Utkarsh PM
NAME OF HOD

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Hemaji Charitable College
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Education Society's
Hemaji Chandaba College, Shelgaon (Rly.
Tal. Barshi, Dist. Solapur (Maharashtra) 413

Class- B.Sc. III

SUBJECT - MICROBIOLOGY

SEMESTER VI

PAPER -XIII MICROBIAL GENETICS

Day's	Task to be completed	Date	Attendance	Methodology
Day1	Structural organization of Escherichia coli	1-1-24	67	Lecture
Day2	Folded fiber model	2-1-24	67	Lecture
Day3	Replication of DNA	3-1-24	66	Lecture
Day4	Enzymes involved and mechism of replicase	5-1-24	67	Lecture
Day5	Transcription RNA Polymerase enzyme	6-1-24	67	Lecture
Day6	Process and post transcriptional modification	8-1-24	67	Lecture
Day7	Operon lonsept lac operon	9-1-24	67	Lecture
Day8	TEST	10-1-24	66	Lecture
Day9	Effect of mutation on translation	11-1-24	67	Lecture
Day10	Effect of mutation on phenotype	12-1-24	67	Lecture
Day11	Time course of phenotype expression	13-1-24	67	Lecture
Day12	Selection detection isolation of mutant	17-1-24	67	Lecture
Day13	Genetic complementation cis and trans test	18-1-24	66	Lecture
Day14	MCQ TEST	19-1-24	67	Test
Day15	Electrophoresis	20-1-24	67	Test
Day16	DNA Sequencing - sanger dideoxy method	22-1-24	67	Test
Day17	DNA finger printing - method and application	24-1-24	66	Lecture
Day18	ASSIGNMENT ON UNIT	25-1-24	67	Lecture
Day19	Introduction tool and techniques of genetic engineering	27-1-24	67	Lecture
Day20	Genetic engineering	29-1-24	67	Lecture
Day21	Application of genetic engineering	30-1-24	67	Lecture
Day22	Protein engineering - method and application	31-1-24	66	Lecture
Day23	TEST	1-2-24	67	Lecture

1	Introduction of bioinformatic	5-2-24	07	online
2	Introduction of major bioinformatic resource on internet	3-2-24	07	Website
3	NCBI	5-2-24	07	Website
4	DDBJ	6-2-24	07	Website
5	EMBL	7-2-24	07	Website
6	Protein data bank	8-2-24	07	Website
7	Nucleic acid sequence database	10-2-24	07	Website
8	The basic local alignment	12-2-24	07	Website
9	TEST	13-2-24	07	Writing

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Gadchiroli, Maharashtra (Govt. Sponsored)

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Class- B.Sc. III

SUBJECT - MICROBIOLOGY

SEMESTER- VI

PAPER - XIV ENVIRONMETAL MICROBIOLOGY

Day's	Task to be completed	Dated on	Attendance	Methodology
Day1	Concept and definition of biosafty	01-2-24	07	Lecture
Day2	Object of biosafty NIH guidelines	05-2-24	07	Lecture
Day3	Regulatory in india - recombinant DNA	06-2-24	07	Lecture
Day4	Advisory committee - institutional biosafty committe	19-2-24	07	Lecture
Day5	District level biosafty committe	20-2-24	07	Lecture
Day6	Microorganisms in air lunching transport deposition of aerosol survival of microorganism in air	21-2-24	07	Lecture
Day7	Significance of microorganisms in air (communal and ipramural)	22-2-24	07	Lecture
Day8	Air method to study Some microorganism sampling quantitative quantitative method	23-2-24	07	Lecture
Day9	Biosecurial control	24-2-24	07	Lecture
Day10	Test	26-2-24	07	Lecture
Day11	Microorganism in marine water method to study aquatic microorganism characteristic of marine environment type of organism and their role	27-2-24	07	Lecture
Day12	Fresh water ecosystem Eutrophication, classification of lake	28-2-24	07	Lecture
Day13	Sources, consequences, control	29-2-24	07	Lecture
Day14	**Assignment on unit**	1-3-24	07	Lecture
Day15	General characteristic of extremophiles and their role	4-3-24	07	Lecture
Day16	Acidophiles, alkalophiles, thermophile	5-3-24	07	Lecture
Day17	Psychrophiles Barophiles, osmophiles	6-3-24	06	Lecture
Day18	**MCQ TEST**	7-3-24	07	ICT
Day19	Types of wastes water assessment and osmogenesis BOD and COD	8-3-24	07	ICT
Day20	Characteristic and treatment of waste from different industries	11-3-24	07	ICT
Day21	Paper and pulp sugar and distillery, textiles and dairy industries	12-3-24	06	ICT
Day22	Bioremediation leat recovery wastes and radioactive			

32.	substance	3 - 3.21	61	Lecture
33	TEST	24 - 3.21	61	Lecture
34	Introduction microorganism involve , biochemistry of microbial leaching	25 - 3.21	61	Lecture
35	Commercial leaching	27 - 3.21	62	Lecture
36	Slope, heap insitu leaching	28 - 3.21	62	Lecture
37	leaching of iron copper and uranium	29 - 3.21	62	Lecture
38	oilrecovery	30 - 3.21	62	Lecture
39	Primary and secondary and microbial enhanced oil recovery	31 - 3.21	62	Lecture
40	Concept of carbon sequestration	1 - 4.21	63	Lecture
41	Carbon credit	3 - 4.21	63	Lecture
42	TEST	13 - 4.21	64	Lecture

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Tal. Barshi, Dist. Solapur (Maharashtra) 413 411

Class- B.Sc. III

SUBJECT MICROBIOLOGY

Sem - VI

PAPER MIC XV CLINICAL MICROBIOLOGY

	Task to be completed	Date	Attendance	Methodology
[illegible]	Bacterial disease - Pseudomonas aeruginosa, mycobacterium leprae	1-1-24	07	Lecture
[illegible]	Clostridium pathogens clinic cholera	2-1-24	07	Lecture
[illegible]	Viral disease - rabies , AIDS .	3-1-24	07	Lecture
[illegible]	Saline flu sheild	4-1-24	06	Lecture
[illegible]	Fungal disease - dermatophytoses , cryptococcosis	5-1-24	07	Lecture
[illegible]	Protozoal disease malaria , giardiasis	6-1-24	07	Lecture
[illegible]	Test	8-1-24	07	Writing
[illegible]	Define pathogenecity and concept of pathogenecity	9-1-24	05	Lecture
[illegible]	Basic concept of microbial adhesion	10-1-24	07	Lecture
Day10	Mechanism of bacterial invasion	11-1-24	07	Lecture
[illegible]	Bacterial toxin	12-1-24	05	Lecture
[illegible]	Types and mechanism of action	13-1-24	07	Lecture
Day13	Mechanism of pathogenicity of viral and fungal infection	15-1-24	07	Lecture
Day14	Unit test	19-1-24	07	Writing
Day15	Biotic ecology vacuumbiogy	20-1-24	07	Lecture
Day16	Types of immune free immunity , killed vaccine	22-1-24	06	Lecture
Day17	New generation vaccine - subunit , recombinant , conjugated DNA	24-1-24	07	Lecture
Day18	Definition , characteristics of bioweapons	27-1-24	07	Lecture
Day19	Advantages and disadvantages of bioweapons examples	29-1-24	07	Lecture
Day20	ASSIGNMENT ON UNIT	30-1-24	07	Writing

21	Characteristics of chemotherapy agent	21-1-24	07	ICT
22	Mechanism of action of different chemotherapeutic agent	1-2-24	07	ICT
23	Acting on cell wall penicillin	2-2-24	07	ICT
24	Bacitracin , vancomycin	3-2-24	07	ICT
25	Acting on protein synthesis streptomycin and chloramphenicol	5-2-24	07	ICT
26	Acting on nucleic acid synthesis quinolone rifampicin	6-2-24	07	ICT
27	Drug acting on folic acid	7-2-24	07	ICT
28	Antiviral agent , antifungal agent , antiprotozoal agent	8-2-24	07	ICT
29	Mechanism of antibiotic resistance	9-2-24	07	ICT
30	Test to guide chemotherapy	12-2-24	07	ICT
31	Diffusion and dilution method	13-2-24	07	ICT
32	TEST	14-2-24	07	Saving

Bhade P N

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Head of the Department
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(Autonomous) Ta-Sonde Dist-Beed

SINATURE OF PRINCIPAL

SUBJECT MICROBIOLOGY

SEMESTER VI

PAPER NAME - MICROBIAL BIOCHEMISTRY

XVI

Day's	Task to Completed	Dated on	Attendance	Methodology
Day1	Define Enzyme and their properties, specificity	14-2-24	67	Lecture
Day2	Mechanism of action of enzyme	15-2-24	67	Lecture
Day3	Define allosteric enzyme and two model explaining mechanism of action	16-2-24	67	Lecture
Day4	Ribozyme and isozymes	17-2-24	64	Lecture
Day5	Factor affecting catalytic efficiency of enzyme proximity and orientation, strain and distortion	20-2-24	67	Lecture
Day6	Acid base catalysis, covalent catalysis	21-2-24	25	Lecture
Day7	Derivation of michaelise menten equation significance of km and vmax	22-2-24	67	Lecture
Day8	Regulation of enzyme synthesis positive control - activator operon	23-2-24	67	Lecture
Day9	End product repression – tryptophan operon catabolite repression	24-2-24	67	Lecture
Day10	TEST	27-2-24	66	Writing
Day11	Cell disbtang and homogenization of membrane bound extraction	28-2-24	67	ICT
Day12	Purification of enzyme on the basis - molecular size - solubility,	29-2-24	67	ICT
Day13	Adsorption chromatography - biological affinity - electric charge	1-3-24	66	ICT
Day14	Immobilization of enzyme methods and applications	2-3-24	67	ICT
Day15	Assay of enzyme	4-3-24	67	Writing
Day16	ASSIGNMENT ON UNIT	5-3-24	67	ICT
Day17	Assimilation of carbon	6-3-24	66	ICT
Day18	Assimilation of nitrogen	7-3-24	66	ICT
Day19	Assimilation sulphur	8-3-24	67	Writing
Day20	ASSIGNMENT ON UNIT	11-3-24	65	Lecture
Day21	Pyruvate as key metabolite, Metabolic pathway	12-3-24	67	Lecture
Day22	ED Pathway, glyoxylate bypass.			

Day23	Pentose phosphate pathway	14-3-24	07	Lecture
Day24	Phosphoketolase pathway	15-3-24	07	Lecture
Day25	Bioluminescence	16-3-24	07	Lecture
Day26	**TEST**	18-3-24	07	Writing
Day27	Biosynthesis of nucleotide	19-3-24	07	Lecture
Day28	Biosynthesis of purine	20-3-24	07	Lecture
Day29	Biosynthesis of pyrimidine	21-3-24	07	Lecture
Day30	Biosynthesis of protein	22-3-24	07	Lecture
Day31	Biosynthesis of peptidoglycan	23-3-24	07	Lecture
Day32	**TEST**	24-3-24	07	Writing

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Hemraj Chandak College, Shrigonda (M.S.)

Syllabus completion report AY 2023-24

Department of Chemistry

Sr.No.	Class	Course Name	Syllabus Completed
1	B.Sc. I	Physical & Inorganic chemistry	100 %

Sr.No.	Student Name	Signature of students
1	Gaikwad Yogesh Shivlal	Gaik
2	Mujawar Farhan Mustafa	MUJ Farhan Mustafa
3	Kalyan Rajendra Kamble	Kalyan Kamble
4	Kasar Bhosale Shinde	Kasar
5	Gaware Mahadev Kalyan	Gaware
6	Sonka Sambhaji Bhalke	Sonka
7	Vaishnavi Sanjay Patil	Vaishnavi Patil
8	Bhosale Balasaheb Tadiwale	A.B. Tadiwale
9	Rajeshwari Shivaji Salunke	R.S. Salunke
10	Kanade Rahul Sampatrao	R. S. Kanade
11	Dusale Rahul Ramchandra	R.R. Dusale
12	Shaikh Simran Mubarak	Shaikh
13	Mane Sunil Nagnath	Mane Sunil
14	Shinde Pavan Ramchandra	Pavan

HOD
Dept.of Chemistry

PRINCIPAL
Hemraj Chandak College Shrigonda
Tal-Karjat, Dist-Ahilyanagar

Hemraj Chandak College, Shelgaon (R).

Bukuit Sarvale	
Yash Mane	
Dhiraj Gavali	
Om Mane	
Satyaget Gund	
Pawan Dhigal	
Chetan Pawar	
Nande Mukadev	
Sahil Ambar	
Deshmukh Vikrant	

HOD

PRINCIPAL

Syllabus completion report AY 2023-24

Department of Chemistry

Sr.No.	Class	Course Name	Syllabus Completed
1	B.Sc. II	Inorganic chemistry	100 %
2	B.Sc. II	Organic chemistry	100 %

Sr.No.	Student Name	Signature of students
1.	Alal Mala Dattatray	N. D Alal
2.	Bankode Gakshi Bapurao	Gakshi
3.	Gaikwad Akanksha A.	Akanksha
4.	Navgude Anjali Tukaram	Navgude A.T
5	Bhosale Sakshi Nannath	Sakshi
6.	Bhusare Vaishnavi Dipak	V.D.Bhusare
7.	Bhosale Komal Pandhari	Komal
8	Bhosale Sakshi Mohan	Sakshi
9.	Ghodake Jadhav Rajaram	J. R. Ghodake
10	Pahi Vaishnavi Dayanand	Vaishnavi
11	Patil Samruddhi Pradip	Samruddhi
12	Pawar Sandhya Ishwar	Pawar
13)	Pede Vaishnavi Sanjay	Pede

HOD
Dept of Chemistry

Principal
Hutatma Chandak College, Malegaon
Tal-Baglan Dist-Nashik

Syllabus completion report AY 2023-24

Department of chemistry

Sr.No.	Class	Course Name	Syllabus Completed
1	B.Sc. III	Physical chemistry	100 %
2	B.Sc. III	Inorganic chemistry	100%
3	B.Sc. III	Organic chemistry	100%
4	B.Sc. III	Analytical chemistry	100%

Sr.no	Name of students	Signature
1)	Raut Ankita Jeevan	A J Raut
2)	shinde Dnyani	D. K. Shinde
3)	Alur Tanaya	T. S. Alur
4)	Shelkhare prajita	Shelkhare
5)	Awate Tanay	
6)	Dige Rutuja	R. B. Dige
7)	Kapse Tejaswini	Kapse T S
8)	mali pratiksha	P. K. mali
9)	Tagtap pallavi	P. S. Tagtap
10)	Jadhav kirti	K. S. Jadhav
11)	Pawar gauri	Gauri
12)	Kamade Snehal	Snehal A K.
13)	Jadhav Renuka	Jadhav R. K.
14)	Awate Samarth	Awate

Head of the Department
Chemistry

Principal
Dnyanji Chandaly College
Shahpur

Syllabus completion report 2023-24

Department of Computer Science

Sr.No.	Class	Course Name	Syllabus Completed
1	B.Sc. II Sem-III	Data Structure	100 %
2	B.Sc. II Sem-IV	Software Engineering	100%

Sr.No.	Student Name	Signature of students
1	Ande Sonarth Sanjay	
2	Kapse Sumedha Kishor	
3	Kendre Ashwini Ashok	
4	Kamble Mahesh Yuvraj	
5	Sathe ankar Tanaji	
6	Mane Jagannath Mahadev	

Sr.No.	Student Name	Signature of students

Head of the Department
Computer Science
Barshi T.P.

Principal
Hanuman Chanderiya College
Aurangabad (M.S.) India

Syllabus completion report AY 2023-24

Department of microbiology

Sr.No.	Class	Course Name	Syllabus Completed
1	B.Sc. I	I Introduction to Microbiology and Microbial diversity	100 %
2	B.Sc. I	II Cell cytology and Microbial Techniques	100%

Sr.No.	Student Name	Signature of students
1	Sonawane Nikhil Mahadev	
2	Mane Sakshi Shivaji	
3	Dalvi Nitin Santosh	N.S.Dalvi
4	Chavan Nikita Balasaheb	
5	Pawar Abhay	
6	Kalyani Rajendra Patil	
7	Pooja Gavali	
8	Salunke Rajeshwari	R.S.Salunke
9	Nikal Sarika	S.S. nikal
10	Sukar Soniya	
11	Sonawane Deborah	S.S.D
12	Mahavir Pandharinath	M.P. Pandharinathe
13	Sarangati Shelake	Shelke

Sr.No.	Student Name	Signature of students

Head of the Department
Microbiology

Sr.No	Student Name	Signature of students
13	Patil V.S	V. S. Patil
14	Nichal S.S	S. S. nichal
15	Gore S.P	S.P. Gore
17	Beg S.M	
18	Kute P.R	
19	Shelake S.V	
20	Pandhermise M.B	M.B.P.
21	Jadhav A.B	A.B. jadhav
22	Nande M.D	
23	Gund S.D	
24	Akash T. Bind	A.T. bind
25	Kadam R.D	
26	Sarade P.P	
27	Gade S.V	
28	More D.V	
29	Aware D.A	
30	Wagh A.V	
31	Dadani N.S	N.S. Patani

Affiliated to Maharashtra Animal and Fishery Sciences University, Nagpur

Tahsildar and Manila Manager's

Hostaji Chandaki College, Shelgaon (K.)

Tal. Pandhurna, Dist. Yavatmal (Maharashtra) 445001

Syllabus completion report AY 2023-24

Department of microbiology

Sr.No.	Class	Course Name	Syllabus Completed
1	B.Sc. I	Microbial Metabolism And cultivation	100 %
2	B.Sc. I	Applied Microbiology	100%

Sr.No.	Student Name	Signature of students
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

Dr. R. Pandit Sawarkar

Head of the Department

Microbiology

Sl No.	Student Name	Signature of students
16	Rahul [illegible]	[illegible]
17	Nikhil [illegible]	[illegible]
18	Sonu [illegible]	[illegible]
19	Anuj [illegible]	[illegible]
20	Mohit [illegible]	[illegible]
21	Shubham [illegible]	[illegible]
22	Prabhavathi [illegible]	[illegible]
23	Jadhav [illegible]	[illegible]
24	Harsha [illegible]	[illegible]
25	Akash [illegible]	[illegible]
26	Kishore [illegible]	[illegible]
27	Ganesh [illegible]	[illegible]
28	Gole [illegible]	[illegible]
29	Pooja [illegible]	[illegible]
30	Pranav [illegible]	[illegible]
31	Mayuri [illegible]	[illegible]
32	Dattatray [illegible]	[illegible]

Practical Syllabus completion report AY 2023-24 Department of microbiology

Sr.No.	Class	Course Name	Syllabus Completed
1	B.Sc. II	V. Bacterial cytology & Metabolism	100 %
2	B.Sc. II	VI. Fundamentals of Bacterial Genetics	100%

Sr.No.	Student Name	Signature of students
1	Pathare Patil	
2	Anand Ghorpade	
3	Aditya Dalave	A. A. Dalave.
4	Shaikh Samiha	
5	Ghorpade Sakshi	
6	Shaikh Sonia	
7	Patil Sanskruti	Sanskruti
8	Patil Pratiksha	
9	Ghorpade Komal	
107	Sakshi Barbude	Sakshi
117	Samiha Kaushal	Samiha
127	Aditya Surywanshi	
137	Sakshi Ghorpade	
147	Sapana Kadam	
157	Ghorpade Tanaji	T. P. Ghorpade
167	Patil Nikita	
177	Lake Vaishnavi	

Head of the Department
Microbiology

Syllabus completion report AY 2023-24

Department of microbiology

Sr.No.	Class	Course Name	Syllabus Completed
1	B.Sc. II	[illegible]	100 %
2	B.Sc. II	[illegible]	100%

Sr.No.	Student Name	Signature of students
1	[illegible]	
2	[illegible]	
3	[illegible]	
4	[illegible]	
5	[illegible]	
6	[illegible]	
7	[illegible]	
8	[illegible]	
9	[illegible]	
10	[illegible]	
11	[illegible]	
12	[illegible]	
13	[illegible]	
14	[illegible]	
15	[illegible]	
16	[illegible]	
17	[illegible]	

Head of the Department
Microbiology

Syllabus completion report AY 2023-24

Department of microbiology

Sr.No	Class		Course Name	Syllabus Completed
1	B.Sc. III	17	Virology	100 %
2	B.Sc. III	3	Environmental Microbiology	100%

Sr.No	Student Name	Signature of students
1	[illegible]	[illegible]
2	[illegible]	[illegible]
3	[illegible]	[illegible]
4	[illegible]	[illegible]
5	[illegible]	[illegible]
6	[illegible]	[illegible]

Head of the Department
Microbiology

Practical Syllabus completion report AY 2023-24 Department of microbiology

Sr.No	Class	Course Name	Syllabus Completed
1	B.Sc. III	XI. Immunology	100%
2	B.Sc. III	XII. Industrial Microbiology	100%

Sr.No	Student Name	Signature of Students
1)	[illegible]	[illegible]
2)	[illegible]	[illegible]
3)	[illegible]	[illegible]
4)	[illegible]	[illegible]
5)	[illegible]	[illegible]
6)	[illegible]	[illegible]

Head of the Department
Microbiology

Practical Syllabus completion report AY 2023-24 Department of microbiology

Sr.No.	Class	Course Name	Syllabus Complet
1	B.Sc. III	XIII Microbial genetics	100 %
2	B.Sc. III	XIV Environmental Micro	100%

Sr.No.	Student Name	Signature of students
1)	[illegible]	[signature]
2)	[illegible]	[signature]
3)	[illegible]	[signature]
4)	[illegible]	[signature]
5)	[illegible]	[signature]
6)	[illegible]	[signature]

Head of the Department
Microbiology

Syllabus completion report AY 2023-24

Department of microbiology

S.No	Class	Course Name	Syllabus Completed
1	B.Sc. III	[illegible] Clinical Microbiology	100 %
2	B.Sc. III	[illegible] Medical Biochemistry	100%

S.No.	Student Name	Signature of students
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Head of the Department
Microbiology

COURSE OUTCOME
NAME OF DEPARTMENT : MATHEMATICS

Name of Program: B.Sc. I

Name of Subject: Mathematics

Semester: Sem I

Course No. / Paper No.: Paper II

Title of Course (Name of Paper): Calculus

Course content	Objectives	Outcomes
Differentiation: Indeterminate forms and L' Hospital's Rule, Successive differentiations, nth derivatives of standard functions, Leibnitz rule, Taylor's theorem and Maclaurin's Theorem (Only Statements); Series expansions of $\cos x$, $\sin x$, $(1+x)^n$, $\log(1+x)$	To introduce to student about indeterminate forms of limit, L' Hospital's Rule, Successive differentiations, nth derivatives of standard functions, Leibnitz rule, Taylor's theorem and Maclaurin's Theorem	The Students can express the power series expansion of a given function and evaluate limits
Function of two variables: Limit and Continuity of functions of two variables, Partial derivative, partial derivative of higher orders, Homogeneous functions, Euler's theorem on Homogeneous functions.	To introduce to student about limits and continuity of two variables, partial derivatives and its higher orders , homogeneous functions, Euler's theorem.	The Students will able to solve limits, partial derivatives of functions of two variables
Reduction formulae: $\int_0^{\pi/2} \sin^n x\,dx, \int_0^{\pi/2} \cos^n x\,dx,$ $\int_0^{\pi/2} \sin^p x \cos^q x\,dx$	To introduce to student about integration of sine and cosine formulae for higher degree.	The Students are able to use techniques for solving integration of sine and cosine
Vector Calculus: Scalar point function, Vector point function, Directional derivative, Gradient , divergence and Curl and its properties.	To introduce to student about vector differentiation with vector differential operator.	The Students will able to use different vector differential operator

Signature of Lecturer:

Signature of HOD
Head of the Department
Mathematics

PRINCIPAL
PRINCIPAL
Hirayi Chandak College
Shelgaon(R) Tal-Sangli

COURSE OUTCOME
NAME OF DEPARTMENT : MATHEMATICS

Name of Program: B.Sc. I

Name of Subject: Mathematics

Semester: Sem-II

Course No. / Paper No.: Paper III

Title of Course (Name of Paper): Geometry

Course content	Objectives	Outcomes
Change of Axis Translations, Rotations, Invariants, Identifications of conics from general form of second degree equations, Polar Coordinates, Conversion formulae.	1.To introduce to student about change of axis.	1.The student will understood the change of axis.
Plane General equation of plane, Normal equation, Intercept form, Angle between two planes, Plane through three points, Plane through a given point, Sides of a plane, Distance of a point from a plane, Family of planes.	2. To introduce to student about plane.	2. The student will understood the plane.
Sphere Centre radius form, General form, Diameter form, Equation of Tangent Plane and condition for tangency, Family of spheres $S + k s' = 0$, $S + k P = 0$	3. To introduce to student about sphere.	3. The student will understood the sphere.

Head of the Department
Mathematics

PRINCIPAL
Hemraj Dhanduji College
Bhusawal Dist. Jalgaon

Signature of Lecturer | Signature of HOD | PRINCIPAL | Page 8

COURSE OUTCOME
NAME OF DEPARTMENT : MATHEMATICS

Name of Programme (B.Sc.)

Name of Subject: Mathematics

Semester: Sem -II

Course No. / Paper No.: Paper IV

Title of Course (Name of Paper): Differential Equation

Course content	Objectives	Outcomes
Differential Equations of first order and first degree (Part-I) Variables separable, Homogeneous non- homogeneous differential equations.	To introduce to student about some method to find solutions of first order and first degree	The Students will able to solve first order and first degree
Differential Equations of first order and first degree (Part-II) Exact differential equations, Necessary and sufficient condition for exactness, Integrating factor with four rules, Linear differential equations of the form, $\frac{dy}{dx} + Py = Q$ Bernoulli's Equation $\frac{dy}{dx} + Py = Qy^n$	To introduce to student about some method to find solutions of first order and first degree	The Students will able to solve first order and first degree.
Linear Differential Equations With Constant Coefficients (Part-I) Complementary function and particular integral, General solution of $f(D)\ y=X$, Solution of $f(D)y=0$ for non-repeated , repeated, real and complex root.	To introduce to student about some method to find solutions of Linear differential equations with constant coefficients.	The Students will able to use techniques for solving Linear differential equations with constant coefficients
Linear Differential Equations With Constant Coefficients (Part-II) Solution of $f(D)y=X$, where X is of the form e^{ax}, $\sin(ax)$, $\cos(ax)$, x^n, $e^{ax}V$, xV.	To introduce to student about some method to find solutions of Linear differential equations with constant coefficients	The Students will able to use techniques for solving Linear differential equations with constant coefficients.

Signature of Lecturer

Signature of HOD
Head of the Department
Mathematics

PRINCIPAL
Hansraj Chandola College
Shahganj(R) Tal-Bansi

Page 1

PROGRAM SUBJECT OUTCOME
NAME OF DEPARTMENT : MATHEMATICS

Name of Program: B.Sc.)		
Name of Subject: Mathematics		
Semester: Sem I		
Course No. / Paper No.: Paper I		
Title of Course /Name of Paper): Algebra		
Course content	Objectives	Outcomes
Matrices : Symmetric and Skew symmetric, Elementary transformations, Rank of a Matrix(Echelon and Normal form), Characteristic equation of a matrix, Cayley Hamilton theorem and its use in finding the inverse of a matrix. **Linear Equations :** Applications of matrices to a system of linear (both homogeneous and non-homogeneous) equations. Eigen values and Eigen vectors. **Complex Number :** Modulus and Argument of a Complex Number, De Moivre's theorem and its applications, Roots of Unity, Roots of Complex Numbers. **Transcendental Functions :** Circular Functions and their inverses and Hyperbolic function of a complex variable with their inverses.	1 To introduce to student about types of matrices rank of a matrix. 2. To introduce to student about solution of simultaneous Equations Eigen values and Eigenvectors. 3. To introduce to student about complex numbers, De Moivre's theorem and its applications roots of unity and roots of complex number 4. To introduce to student about circular functions and their inverses, hyperbolic functions of a complex number	1 The Students are able to use techniques for solving matrices. 2 The Students are able to use matrices techniques for solving system of linear equations, Eigen values and Eigen vectors. 3. The Students are able to use techniques for solving complex roots of unity. 4. The student can understood the transcendental functions.

Head of the Department
Mathematics

PRINCIPAL
Hemlal Chandak College
Sheloki(R) Tal-Sakoli

Signature of Lecturer | Signature of HOD | PRINCIPAL | Page 2

PROGRAM SUBJECT OUTCOME
NAME OF DEPARTMENT : MATHEMATICS

Name of Program: B.Sc. I		
Name of Subject: Mathematics		
Semester: Sem I		
Course No. / Paper No.: Paper II		
Title of Course (Name of Paper): Calculus		
Course content	Objectives	Outcomes
Differentiation: Indeterminate forms and L' Hospital's Rule, Successive differentiations, nth derivatives of standard functions, Leibnitz rule, Taylor's theorem and Maclaurin's Theorem (Only Statements), Series expansions of , cos x, sin x, $(1+x)^n$, log(1+x). **Function of two variables:** Limit and Continuity of functions of two variables, Partial derivative, partial derivative of higher orders, Homogeneous functions, Euler's theorem on Homogeneous functions. **Reduction formulae:** $\int_0^{\pi/2} \sin^n x\,dx, \int_0^{\pi/2} \cos^n x\,dx,$ $\int_0^{\pi/2} \sin^m x \cos^n x\,dx$ **Vector Calculus:** Scalar point function, Vector point function, Directional derivative, Gradient , divergence and Curl and its properties.	1.To introduce to student about Indeterminate forms of type, L' Hospital's Rule, Successive differentiations, nth derivatives of standard functions, Leibnitz rule, Taylor's theorem and Maclaurin's Theorem. 2. To introduce to student about limits and continuity of two variables, partial derivatives and its higher orders, homogeneous functions, Euler's theorem. 3. To introduce to student about integration of sine and cosine formulae for higher degree. 4. To introduces to student about vector differentiation with vector differential operator.	1. The Students can express the power series expansion of a given function and evaluate limits. 2. The Students will able to solve limits, partial derivatives of functions of two variables. 3. The Students are able to use techniques for solving integration of sine and cosine. 4. The Students will able to use different vector differential operator.

Signature of Lecturer

Signature of HOD
Head of the Department
Mathematics

PRINCIPAL
Hansraj Chandak College
Shegaon(M.S.) 444 203

PROGRAM SUBJECT OUTCOME
NAME OF DEPARTMENT : MATHEMATICS

Name of Program: B.Sc. I		
Name of Subject: Mathematics		
Semester: Sem-II		
Course No. / Paper No.: Paper III		
Title of Course (Name of Paper): Geometry		
Course content	Objectives	Outcomes
Change of Axis : Translations, Rotations, Invariants, Identifications of conics from general form of second degree equations, Polar Coordinates, Conversion formulae. **Plane :** General equation of plane, Normal equation, Intercept form Angle between two planes, Plane through three points, Plane through a given point, Sides of a plane, Distance of a point from a plane, Family of planes. **Sphere :** Centre radius form, General form, Diametre form, Equation of Tangent Plane and condition for tangency, Family of spheres $S + \lambda s' = 0$, $S + \lambda P = 0$	1.To introduce to student about change of axis 2. To introduce to student about plane. 3. To introduce to student about sphere.	1. The student will understood the change of axis. 2. The student will understood the plane. 3. The student will understood the sphere.

Signature of Teacher

Signature of HOD
Head of the Department
Mathematics

PRINCIPAL
Hemraj Chandak College
Chalisgaon (P) Tal-Barsi

PROGRAM SUBJECT OUTCOME
NAME OF DEPARTMENT : MATHEMATICS

Name of Program: B.Sc. I

Name of Subject: Mathematics

Semester: Sem -II

Course No. / Paper No.: Paper IV

Title of Course (Name of Paper): Differential Equation

Course content	Objectives	Outcomes
Differential Equations of first order and first degree :[Part-I] Variables separable, Homogeneous, non- homogeneous differential equations **Differential Equations of first order and first degree :[Part-II]** Exact differential equations. Necessary and sufficient condition for exactness. Integrating factor with four rules. Linear differential equations of the form: $\frac{dy}{dx} + Py = Q$ Bernoulli's Equation $\frac{dy}{dx} + Py = Q y^n$ **Linear Differential Equations With Constant Coefficients :[Part-I]** Complementary function and particular integral. General solution of $f(D)y=X$. Solution of $f(D)y=0$ for non-repeated , repeated, real and complex root. **Linear Differential Equations With Constant Coefficients : [Part-II]** Solution of $f(D)y=X$, where X is of the form e^{ax} , $\sin(ax)$, $\cos(ax)$, x^n , V, xV	1.To introduce to student about some method to find solutions of first order and first degree. 2. To introduce to student about some method to find solutions of first order and first degree. 3. To introduce to student about some method to find solutions of Linear differential equations with constant coefficients. 4. To introduce to student about some method to find solutions of Linear differential equations with constant coefficients.	1.The Students will able to solve first order and first degree. 2. The Students will able to solve first order and first degree. 3. The Students will able to use techniques for solving Linear differential equations with constant coefficients. 4.The Students will able to use techniques for solving Linear differential equations with constant coefficients.

Signature of Teacher | Signature of HOD | PRINCIPAL

Head of the Department
Mathematics

PRINCIPAL
Hemaji Chandra College

Vidyabharati Mahila Mandal's

Hemuji Chandele College, Shelgaon (R).

Tal. Barshi, Dist. Solapur (Maharashtra) 413225

Name Department:

(B.Sc.Botany)

Program Outcome [B.Sc. Botany]

- Students have scope in forestry
- Students can build their tissue culture lab
- Students can start to grow plants for nursery
- Students can apply for various examinations of MPSC & UPSC
- Students can build up their research carrier in field of Botany
- Students can build up their research carrier in field of Taxonomy of plants
- Students can build up their research carrier in field of plant breeding
- Students can be able to follow new methodology for plant growth and propagation.
- Students can apply new methodologies in farm for better yield.
- Students can prepare pestisides, perfumes, herbal medicines, cosmetics by using various plant sources.
- Students get basic knowledge about algae, bryophytes, fungi, pteridophytes and gymnospermic plants.
- Students will get criteria of plant classification, identification and nomenclature of plants.
- Students will get appropriate knowledge about concepts in enzymology, biomolecules and cell biology.
- Students will get knowledge about bioinstrumentation.
- Students will get detail knowledge about applications of different instruments in industry.
- Students will get detail knowledge about ethenobotany of plants.
- Students get basic knowledge about basic concepts in biostat.
- Students get basic knowledge about medalian and human genetics of plant classification, identification and nomenclature of plants.
-

Head of the Department
Botany

Principal
Hemuji Chandele College
Shelgaon(R) Tal-Barshi Dist-Solapur

COURSE OUTCOME

Name of Department - Botany

– B.Sc. 1st		
NAME OF SUBJECT - Botany		
SEM I / II / III / IV		
COURSE NUMBER (PAPER NUMBER) - I		
TITLE OF COURSE (NAME OF PAPER)- **Microbiology and Phycology**		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1 : Introduction of Microbiology	To get the knowledge about the basic concepts in microbiology.	The student can understand the basic concept of microbiology.
Unit 2: Viruses: General characters, structure, classification (plant, animal and bacterial viruses) and economic importance of viruses.	To get the knowledge about the characters, structure and economic importance of viruses.	The student can understand in detail about the viruses.
Unit 3: Bacteria: Characteristics of bacteria, size, forms (Shapes), ultra structure of bacterial cell, Economic importance.(Useful and harmful).	To get the knowledge about the forms, size and diversity of bacteria.	The student can understand in detail about the bacteria.

Unit 4 : Mycoplasma: (Phytoplasma and Spiroplasma) Characters, Structure, classification and significance:	To get the knowledge about the Mycoplasma	The student can understand in detail about the Mycoplasma
Unit 5 : Algae: 5.1 General characters and classification of algae (As per Smith-	To get the knowledge about the characters, classification and reproduction of algae.	The student can understand in detail about the algae

55) up to class. Range of thallus organization Methods of reproduction		
Unit 6 : Cyanophyta: General Characters of Cyanophyta Study of *Nostoc* – Occurrence, Classification, thallus structure and reproduction	To get the knowledge about the Characters, occurrence & reproduction of Cyanophyta division of Algae	The student can understand in detail about the division Cyanophyta
Unit 7 : Chlorophyta: General Characters of Chlorophyta Study of *Spirogyra* - Occurrence, Classification, thallus structure and reproduction	To get the knowledge about the Characters, occurrence & reproduction Chlorophyta division of algae	The student can understand in detail about the division Chlorophyta
Unit 8 : Phaeophyta: General Characters of Phaeophyta Study of *Sargassum* - Occurrence, Classification, thallus structure and reproduction (excluding developmental details of sex organs and sporophyte)	To get the knowledge about the Characters, occurrence & reproduction in Phaeophyta division of algae	The student can understand in detail about the division Phaeophyta

Unit 9 9.1 : Applied Phycology: Role of algae in the environment, agriculture, biotechnology and Industry	To get the knowledge about the application of Algae in various field.	The students can understand in detail about the importance & uses of Algae.

Signature of HOD
Head of the Department
Botany

Principal
Hemuli Chandola College
Shergaon(P.O.) Tah-Gohpur Dist-Sonitpur

COURSE OUTCOME

– B.Sc. -I		
NAME OF SUBJECT - Botany		
SEM – I / II / III – IV -I		
COURSE NUMBER (PAPER NUMBER) - II		
TITLE OF COURSE (NAME OF PAPER)- FUNGI and ARCHEGONIATE (Bryophytes, Pteridophytes, Gymnosperms)		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Introduction 1.1 Unifying characters of archegoniates and Alternation of generations.	To get the knowledge about the general introduction of Archegoniates.	The student can understand about the general introduction of Archegoniates.
Unit 2: Bryophytes 2.1 General characteristics and Classification (As per G. M. Smith): Study of *Riccia* with respect to occurrence, classification, thallus structure and reproduction (without developmental stages) Economic importance	To get the knowledge about the Bryophytes with suitable example.	The student can understand about the Bryophytes and life cycle of *Riccia*.

Unit 3: Pteridophytes General characteristics and classification, up to class (as per smith). Study of *Selaginella* with respect to occurrence, classification morphology of sporophyte, anatomy (stem) and reproduction (without developemental stages) Economic importance	To get the knowledge about the Pteridophytes with suitable example	The student can understand about the Pteridophytes and life cycle of *Selaginella*
Unit 4: Gymnosperms 4.1: General characteristics and classification (Sporne) 4.2: Study of *Cycas* with respect to occurrence, classification, morphology, sporophyte and Coralloid roots. Anatomy of Leaf and coralloid root and reproduction-structure of male cone and megasporophyll (without developmental stages) 4.3 : Economic importance	To get the knowledge about the Gymnosperms with suitable example.	The student can understand about the Gymnosperms and life cycle of *Cycas*

Principal
Hemuji Chandele College
Shirgaon(P) Tal Barshi Dist-Solapur

Head of the Department
Botany

COURSE OUTCOME

Name of Department - Botany

: B.Sc.I		
NAME OF SUBJECT	: Botany	
SEM I / II / III / IV /	: II	
COURSE NUMBER (PAPER NUMBER)	: III	
TITLE OF COURSE (NAME OF PAPER) : PLANT ECOLOGY		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit-1 - **Introduction** 1.1) Climatic factors 1.2) Edaphic factors	To get the knowledge about the climatic and Edaphic factors of environment.	The student can understand about the Climatic and Edaphic factors of environment.
Unit-2 **Community Ecology-** 2.1) Form and stricture of communities 2.2) Classification and Physiognomy. 2.3) Community characteristics	To get the knowledge about the Community ecology.	The student can understand about the Community ecology.
Unit-3 **Ecosystems** 3.1) Concept and types 3.2) Components and Organization of ecosystem 3.3) Ecological pyramids, Food chains and food webs.	To get the knowledge about the ecosystem.	The student can understand about the Concept , types, various ecological pyramids and various biogeochemical

Energy flow in ecosystem Biogeochemical cycles – Nitrogen, Oxygen, Carbon		cycles.
Unit-4 **Ecological Succession** 4.1) Concept and process 4.2) Primary and Secondary succession 4.3) Hydrosere and xerosere	To get the knowledge about the Ecological succession.	The student can understand about the Ecological succession.
Unit-5 **Ecological adaptations** 5.1) Concept 5.2) Xeric, Hydric and Mesic adaptations	To get the knowledge about the Ecological adaptations.	The student can understand about the Ecological adaptations in plants.
Unit-VI-**Pollution** :- 6.1)Introduction 6.2) Air pollution-Sources of air pollutants, their effects and control measures. 6.3) Water pollution- Sources of water pollutants, their effects and control measures.	To get the knowledge about the air pollution and water pollution.	The student can understand about the Air and water pollution.I

Head of the Department
Botany
Signature of HOD

Principal
Hemuji Chandele College
Shelgaon(R) Tal-Kurduwadi Dist-Solapur

COURSE OUTCOME

Name of Department - Botany

: B.Sc. I		
NAME OF SUBJECT : Botany		
SEM I / II / III / IV : II		
COURSE NUMBER (PAPER NUMBER) : IV		
TITLE OF COURSE (NAME OF PAPER) : **& Taxonomy of Angiosperms**		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Apical meristem: Introduction & Classification of meristems , Functions of meristem , Theories of structural development- The Apical cell theory Histogen theory Tunica corpus theory	To get the knowledge about the meristem in plants.	The student can understand about the Meristamatic tissue in plants.
Unit 2 : Permanent tissues: Structure and functions of simple tissues, Structure and functions of complex tissues. Types of vascular bundles.	To get the knowledge about the permanent tissues in plants.	The student can understand about the permanent tissue in plants.
Unit 3 : Tissue system and their functions:	To get the knowledge about	The student can understand about the

Epidermal tissue System , Secretary Tissue System, Mechanical tissue System	the tissue system and their function in plants.	tissue system in plants.
Unit 4 : Secondary body of the plant: Normal secondary growth in Dicot root and Stem. Periderm, Lenticels and annual rings. Basic structure of wood and its types.	To get the knowledge about the Secondary body of the plant.	The student can understand about the Secondary body plants.
Unit 5: Taxonomy of Angiosperms: Morphology of Inflorescence, Flower, Fruit. Study of Angiosperm families with respect to classification morphology of vegetative & reproductive parts, floral formula, floral diagram, diagnostic features and economic importance. 1.Combretaceae 2.Asclepidaceae 3.Amaranthaceae 4.Liliaceae	To get the knowledge about the Taxonomy of angiospetms.	The student can understand about the taxonomy of angiosperms.

Principal
Hemuji Chandele College
Bhalgaon(R) Tal-Sakoli Dist-Gondpur

Signature of HOD
Head of the Department
Botany

COURSE OUTCOME

Name of Department - Botany

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.		
NAME OF SUBJECT : Botany		
SEM I / II / III / IV / V / VI : III		
COURSE NUMBER (PAPER NUMBER) : V		
TITLE OF COURSE (NAME OF PAPER) : Plant Anatomy		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Apical meristem: Introduction & Classification of meristems , Functions of meristem , Theories of structural development- The Apical cell theory Histogen theory Tunica corpus theory	To get the knowledge about the meristem in plants.	The student can understand about the Meristamatic tissue in plants.
Unit 2 : Permanent tissues: Structure and functions of simple tissues, Structure and functions of complex tissues Types of vascular bundles.	To get the knowledge about the permanent tissues in plants.	The student can understand about the permanent tissue in plants.
Unit 3 : Tissue system and their functions: Epidermal tissue System , Secretary Tissue System, Mechanical tissue System	To get the knowledge about the tissue system and their function in plants.	The student can understand about the tissue system in plants.

Unit 4 : Secondary body ofthe plant: Normal secondary growth inDicot root and Stem. Periderm, Lenticels andannual rings. Basic structure of wood andits types.	To [illegible] the knowledge about the [illegible] secondary body [illegible] of the plant.	The student can understand about theSecondary body plants.
Unit 5:-Tissue System **Epidermal tissue system** **Secrerary tissue system** **Mechanical tissue system**	knowledge about Tissue System	understand about the **Tissue System**

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Botany

COU... UTCOME

B.A. / B.Sc. / M.A. / M.Sc. –
NAME OF SUBJECT - Botany
SEM I / II / III / IV / V / VI - III
COURSE NUMBER (PAPER NU...) : BOT...
TITLE OF COURSE (NAME OF ...) : Plant Metabolism

COURSE CONTENT	...ECTIVES	OUTCOME
Unit 1: ATP-Synthesis 1.1: Introduction. 1.2: Structure of ATP molecule. 1.3: Mechanism of ATP synthesis. (Oxidative and photophosphorylation). 1.4: ATP synthase, Boyers conformational model, Racker's experiment, Jagendorf's experiment.	...the ...dge about ...P synthesis ...m.	The student can understand about ATP synthesis in plants.
Unit 2: Carbon Oxidation 2.1: Introduction. 2.2: Glycolysis. 2.3: Pentose phosphate pathway. 2.4: oxidative decarboxylation of pyruvate. 2.5: Regulation of PDH, NADH shuttle. 2.6: TCA cycle. 2.7: Mitochondrial electron transport. 2.8: oxidative phosphorylation. 2.9: cyanide-resistant respiration.	...the ...dge about ...tion ...on.	The student can understand about carbon oxidation
Unit 3: Carbohydrate Metabolism 3.1: Introduction and broad classification. 3.2: Monosaccharides: Properties and Examples: Trioses, Tetroses, Pentoses and Hexoses.	...the ...dge about ...bohydrate ...lism.	The student can understand about carbohydrate metabolism.

3.3: Oligosaccharides: Properties and Examples: Sucrose, Maltose and Lactose. 3.4: Polysaccharides— Properties and Examples— Starch and Cellulose. : Isomers, enantiomers and epimers. : Biosynthesis of sucrose and starch. : Degradation of sucrose and starch.		
Unit 4: Lipid Metabolism 4.1: Introduction and classification. 4.2: Saturated fatty acids— properties and examples— Stearic and palmitic acids. 4.3: Unsaturated fatty acids— Properties and Examples— Linoleic and linolenic acids. 4.4: General outline of fatty acid biosynthesis. : Beta oxidation of fatty acids. : Gluconeogenesis of fatty acids during germination. : Properties and significance of lipids.	: the dge about d ities	The student can understand about lipid metabolism

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COURSE OUTCOME

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Botany
SEM I / II / III / IV / V / VI	
COURSE NUMBER (PAPER NUMBER)	VII
TITLE OF COURSE (NAME OF PAPER)	Plant Physiology

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Photosynthesis: Introduction and significance Photosynthetic apparatus Photosynthetic pigments, accessory pigments Photosystems – reaction center complexes Light reaction-cyclic and non-cyclic Dark reactions Calvin cycle, C4 cycle CAM.	To get the knowledge about the Photosynthesis.	The student can understand about the How photosynthesis process carry out in plants.
Unit 2: Nitrogen metabolism Introduction Nitrogen cycle Biological N2 fixation – Definition, types & organisms involved Mechanism of Biological Nitrogen fixation Significance of Biological Nitrogen fixation.	To get the knowledge about the Nitrogen metabolism.	The student can understand about the Nitrogen metabolism.

Unit 3: Genetics- 3.1: Introduction, terminology 3.2: Mendelism- History 3.3: Principles of inheritance:- Law of dominance, Law of purity of gametes, Law of independent assortment. 3.4: Gene interaction- Definition, types- complementary, supplementary and inhibitory genes.	...t the ...ledge ... the basic ...pts and ...ples of ...ics.	The student can understand about the Basic concepts and principles of genetics.
Unit 4:Classical genetics 4.1: Linkage-Definition, kinds of linkage-complete, incomplete and linkage groups. Significance of linkage. 4.2: Crossing over-definition. Mechanism of crossing over. Break and exchange theory. Significance of crossing over.	...t the ...ledge ... the ...ge and ...ing over.	The student can understand about the Linkage and crossing over.
Unit 5: Multiple alleles- 5.5: Introduction and definition 5.2: Eye color in Drosophila 5.3: Blood groups in man 5.4: Self incompatibility in plant.	...t the ...ledge ... the ...le alleles.	The student can understand about the Multiple alleles.

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COURSE OUTCOME

– B.Sc-II		
NAME OF SUBJECT - **Botany**		
SEM I / II / III / IV- IV		
COURSE NUMBER (PAPER NUMBER) - **VIII**		
TITLE OF COURSE (NAME OF PAPER)- **Embryology of Angiosperm**		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Structural Organization of Flower : Induction of flowering. : Flower as a modified determinate shoot.	To get the knowledge about the flower development	The student can understand about the development of flower.
Unit 2: Pollination and fertilization 2.1: Anther wall: Structure and functions 2.2: Microsporogenesis. : Callose deposition and its significance. : Male Gametophyte Development. : NPC system (in brief). : Palynology and scope (a brief account of Melissopalynology)	To get the knowledge about the anther and pollen biology.	The student can understand about anther and pollen biology.

: Structure: Types of ovule. : Megasporogenesis, Female gametophyte (Embryo sac). : Female gametophyte development - Monosporic, Bisporic and Tetrasporic.	To get the knowledge about the structure, types and development of embryo sac in ovule	The student can understand about the ovule.
: : Pollination types and significance. : Structure of stigma and style. : Path of pollen tube in pistil. : Double fertilization.	To get the knowledge about the pollination and fertilization in plants.	The student can understand about the pollination and fertilization.
Unit 3: Embryo, Endosperm development : Introduction. : Structure and types of endosperm. : Structure of monocot and dicot seed. 5.4. Seed dispersal.	To get the knowledge about the structure of embryo and endosperm	The student can understand about the embryo and endosperm.
Unit 4:Seed and Fruit dispersal :Introduction Agent and mechanism of seed and fruit dispersal	To get the knowledge about the dispersal of seed and fruit	The student can understand about the dispersal of seed and fruits

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Name Department: CHEMISTRY

Program Outcome [B.Sc. Chemistry]

- Obtain knowledge with facts and findings related to chemistry
- Understands the fundamental concept, principles and working of theories related to scientific phenomena
- Gain enough skill in handling instruments, planning and execution of innovative experimen
- Obtain the observations and drawing logical answers from the conducted experiments.
- Able to do creative thinking and put the conclusions based on scientific findings.
- Develop the critical thinking ability and analytical mindset.
- Realize the knowledge of the subject and utilize it for the benefit of the human mankind.

Name of Department: Chemistry

B.Sc.I
NAME OF SUBJECT: Physical Chemistry
SEM I
COURSE NUMBER (PAPER NUMBER): P-I
TITLE OF COURSE (NAME OF PAPER): Physical Chemistry

COURSE CONTENT	OBJECTIVES	OUTCOME
Chemical kinetics Chemical Kinetics and it's scope, Rate of reaction, Definition and units of rate constant. Factors affecting rate of reaction. Concentration, pressure, temperature and catalyst. Order and Molecularity of reaction. First order reaction: Derivation of Rate constant. Characteristics of first order reaction. Examples: Decomposition of N_2O_5 Second order reaction: Derivation of rate constant for equal and unequal concentration of the reactants. Characteristics of Second order reaction. Examples :i) Reaction between $K_2S_2O_8$ and KI . Pseudo-unimolecular reactions such as Hydrolysis of methyl acetate in presence of acid. Methods to determine the order of reaction:	**TO know the basic concept of** Chemical Kinetics and it's scope, Rate of reaction, Definition and units of rate constant. Factors affecting rate of reaction. Concentration, pressure, temperature and catalyst. Order and Molecularity of reaction. First order reaction: Derivation of Rate constant, Characteristics of first order reaction. Examples: Decompesition of N_2O_5 Second order reaction: Derivation of rate constant for equal and unequal concentration of the reactants. Characteristics of Second order reaction. Examples :i) Reaction between $K_2S_2O_8$ and KI . Pseudo-unimolecular reactions such as Hydrolysis of methyl acetate in presence of Acid. Methods to determine the	**Students should understand** Chemical Kinetics and it's scope, Rate of reaction, Definition and units of rate constant. Factors affecting rate of reaction. Concentration, pressure, temperature and catalyst. Order and Molecularity of reaction. First order reaction: Derivation of Rate constant. Characteristics of first order reaction. Examples: Decomposition of N_2O_5 Second order reaction: Derivation of rate constant for equal and unequal concentration of the reactants. Characteristics of Second order reaction. Examples :i) Reaction between $K_2S_2O_8$ and KI . Pseudo-unimolecular reactions such as Hydrolysis of methyl acetate in presence of Acid. Methods to determine the order of reaction:

a) Integration method, b) Graphical method c) Half change method, d) Ostwald's isolation method (Numerical Problems Expected)	order of reaction: a) Integration method, b) Graphical method c) Half change method, d) Ostwald's isolation method (Numerical Problems Expected)	a) Integration method, b) Graphical method c) Half change method, d) Ostwald's isolation method (Numerical Problems Expected)ents should under stand the basic concept like
Mathematical concept Graphical representation : Graph paper, co-ordinates of a point, equation of straight line and intercept, plotting of graph based on experimental data. Derivative : Rules of differentiation (without proof) pertaining to algebraic and exponential functions. Example related to chemistry. Integration : Rules of Integration (without proof) pertaining to algebraic and exponential functions. Example related to chemistry. (Numerical Problems not expected)	**To develop a skill of solving Numerical Problems.** Graphical representation : Graph paper, co-ordinates of a point, equation of straight line and intercept, plotting of graph based on experimental data. Derivative : Rules of differentiation (without proof) pertaining to algebraic and exponential functions. Example related to chemistry. Integration : Rules of Integration (without proof) pertaining to algebraic and exponential functions. Example related to chemistry. (Numerical Problems not expected)	**Students should increase the ability of solving Numerical Problems.** Graphical representation : Graph paper, co-ordinates of a point, equation of straight line and intercept, plotting of graph based on experimental data. Derivative : Rules of differentiation (without proof) pertaining to algebraic and exponential functions. Example related to chemistry. Integration : Rules of Integration (without proof) pertaining to algebraic and exponential functions. Example related to chemistry. (Numerical Problems not expected)
Thermodynamics 3.1 Spontaneous and non spontaneous processes, Second law of thermodynamics and its different statements. 3.2 Carnot's Theorem (Heat engine), Carnot cycle and its efficiency. (Numerical Problems Expected)4.1 a) **Gaseous State** Ideal and Non ideal gases, b) Deviation from ideal behaviour. (Only Boyle's law) c) Causes of deviation, van der Waal's equation, explanation	**To understand the basic concept like** 3.1 Spontaneous and non spontaneous processes. Second law of thermodynamics and its different statements. 3.2 Carnot's Theorem (Heat engine), Carnot cycle and its efficiency. (Numerical Problems Expected **To understand the basic**	**Students Should understand the basic concepts in Thermodynamics.** 3.1 Spontaneous and non spontaneous processes, Second law of thermodynamics and its different statements. 3.2 Carnot's Theorem (Heat engine), Carnot cycle and its efficiency. (Numerical Problems Expected **Students Should understand the basic concepts in** Ideal and Non ideal gases, b)

of real gas behavior by van der Waal's equation. Critical Phenomena : PV-Isotherms of real gases (Andrews's Isotherms), continuity of state, Relationship between critical constants and van der Waal's constants. Liquification of gases, Joule-Thomson effect. (Numerical Problems expected)	concept like Ideal and Non ideal gases. b) Deviation from ideal behaviour. (Only Boyle's law) c) Causes of deviation, van der Waal's equation, explanation of real gas behavior by van der Waal's equation. 4.2 Critical Phenomena : PV-Isotherms of real gases (Andrew's isotherms), continuity of state, Relationship between critical constants and van der Waal's constants. 4.3 Liquification of gases, Joule-Thomson effect. (Numerical Problems expected)	Deviation from ideal behaviour. (Only Boyle's law) c) Causes of deviation, van der Waal's equation, explanation of real gas behavior by van der Waal's equation. 4.2 Critical Phenomena : PV-Isotherms of real gases (Andrew's isotherms), continuity of state, Relationship between critical constants and van der Waal's constants. 4.3 Liquification of gases, Joule-Thomson effect. (Numerical Problems expected)

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B.A. / B.Sc. / M.A. / M.Sc.	: **B.Sc. I**
NAME OF SUBJECT	: Inorganic Chemistry
SEM I / II / III / IV / V / VI	: Sem. I
COURSE NUMBER (PAPER NUMBER)	: P-II
TITLE OF COURSE (NAME OF PAPER)	: **Inorganic Chemistry**

COURSE CONTENT	OBJECTIVES	OUTCOME
1. Atomic Structure and periodic properties 1.1 Atomic Structure a) Shapes of s, p, d orbital's. b) Aufbau and Pauli's exclusion principle, Hund's rule of maximum multiplicity c) General electronic configuration of s and p	Students should get knowledge about structure and periodical properties of Atoms.	Students have understood about the atomic structure, electronic configuration, and periodical properties of Atoms from s and

block elements. 1.2 General Characteristics of s and p block elements w.r.t. Atomic and Ionic radii, Ionization energy, Electron affinity, Electronegativity, Reactivity, Melting and Boiling point		p block elements.
2. Chemical bonding and Ionic Solids 2.1 Types of chemical bonding 2.2 Ionic Bonding a) Formation of ionic bond, Energetics of ionic bonding : Ionisation potential, Electron affinity and Lattice energy. b) Characteristics of ionic compounds. c) Born-Haber Cycle for Alkali metal halide (NaCl). d) Fajan's rules. 2.3 Radius ratio and crystal structure. a) Definition: Radius ratio (r^+ / r^-), Coordination number, Stoichiometry and unit cell. b) Concept and calculation of radius ratio (r^+ / r^-) for ionic solid with octahedral geometry. c) Radius ratio effect on geometry. d) Crystal structure of NaCl and CsCl w.r.t. unit cell, radius ratio, coordination number and stoichiometry.	Students should get knowledge about Chemical bonding and crystal structure of ionic solids.	Students have understood about: How the chemical bonds are formed and what are their types. Stability of crystal structure, Internal structure of ionic solids like NaCl, CsCl etc.
3. Covalent bonding: Valence Bond Theory (VBT) Approach 3.1 Valence Bond Theory: Heitler-London Theory and Pauling-Slater Theory 3.2 Limitations of VBT 3.3 Need of Hybridization 3.4 Types of hybridization and shapes of simple inorganic molecules: $BeCl_2$, BF_3, $SiCl_4$, PCl_5, SF_6, IF_7 3.5 Valence Shell Electron Pair Repulsion (VSEPR) Theory w.r.t. NH_3, H_2O, ClF_3	Students should get knowledge about hybridization concept, structure and bonding in covalent inorganic compounds.	Students have understood about formation of diatomic molecules, concept of hybridization, structure and bonding in covalent inorganic compounds.
4. Covalent bonding: Molecular Orbital Theory (MOT) Approach Atomic and Molecular orbitals 4.2 L.C.A.O. Principle 4.3 Bonding, Antibonding and Nonbonding Molecular orbitals. 4.4 Conditions for successful overlap 4.5 Different types of overlap (s-s, s-px, px –	Students should get knowledge about formation of molecular orbital's, bonding and characteristics of simple diatomic molecules.	Students have understood about construction of molecular orbital's and there use for the explanation of bonding and characteristics

px and py- py or pz- pz) 4.6 Energy level sequence of molecular orbitals for n = 1 and n = 2 4.7 M. O Diagrams for: a) Homonuclear diatomic molecule. H_2, Li_2, Be_2, C_2, N_2 and O_2 b) Heteronuclear diatomic molecules CO and NO w.r.t. bond order stability and magnetic properties.		(Magnetic behavior and stability) in simple diatomic molecules. Concept of electron deficient bonding (2C-1e, 3C-2e etc.)

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Chemistry

B.Sc. I		
NAME OF SUBJECT: Organic Chemistry		
SEM II		
COURSE NUMBER (PAPER NUMBER) P-III		
TITLE OF COURSE (NAME OF PAPER): OrganicChemistry		
COURSE CONTENT	**OBJECTIVES**	**OUTCOME**
1. Fundamentals of organic reaction mechanism 1.1 Meaning of reaction mechanism. 1.2 Curved arrow notation, Half headed and double headed arrows. 1.3 Types of bond breaking :Homolytic and Heterolytic. 1.4 Types of reagents : Electrophilic and Nucleophilic. 1.5 Types and sub-types of following organic reactions with definition and at least one example of each: a) Substitution b) Addition c) Elimination d) Rearrangement. (Mechanism is not expected) 1.6 Reactive Intermediates with examples carbocations: carbanions (formation, structure,	**To study** Meanings of terms involved in organic reactions like arrow notations, types of bonding. Types of reagents and intermediates formed in the reactions.	**Students gain in understanding of :** Basic terms involved in the organic reactions. Types and subtypes of reactions, reagents and intermediates in the organic reactions.

stability and reactions are expected). Carbon free radicals, carbenes, arenes, nitrenes (Definition with example only)		
2. Structure and Bonding 2.1 Hybridization: sp^3, sp^2 and sp w.r.t. methane, ethylene and acetylene respectively. 2.2 Bond length, Bond angle and Bond energy with factors affecting these properties w.r.t. : sp^3, sp^2 and sp hybridization 2.3 Resonance effect with respect to phenol, and nitrobenzene. 2.4 Hyperconjugation w.r.t. toluene. 2.5 Inductive effect, + I and - I. 2.6 Steric effect w.r.t. mesitoic acid	**To study** 2.1 Hybridization: sp^3, sp^2 and sp w.r.t. methane, ethylene and acetylene respectively. 2.2 Bond length, Bond angle and Bond energy with factors affecting these properties w.r.t. : sp^3, sp^2 and sp hybridization 2.3 Resonance effect with respect to phenol, and nitrobenzene. 2.4 Hyperconjugation w.r.t. toluene. 2.5 Inductive effect, + I and - I. 2.6 Steric effect w.r.t. mesitoic acid	**Students gain an understanding of :** The Hybridization involved in molecule and get knowledge of Bond length, Bond angle and Bond energy possess by molecule. Students gains the knowledge of various effects exerted by the organic compounds like Resonance effect with respect to phenol, and nitrobenzene, Hyperconjugation w.r.t. toluene, Inductive effect, + I and – I, Steric effect w.r.t. mesitoic acid
3. Alkanes and Cycloalkanes 3.1 Alkanes : Methods of formation with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acid. 3.2 Mechanism of free radical halogenation of alkanes. 3.3 Cycloalkanes - Nomenclature methods of formation (a) Internal Wurtz reaction (b) Distillation of calcium or barium salt of dicarboxylic acid. 3.4 Chemical properties of cyclopropane (i) Free radical substitution of chlorine in presence of light. (ii) Action of HBr and conc. H_2SO_4 iii) Catalytic reduction by	**To study** 3.1 Alkanes : Methods of formation with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acid. 3.2 Mechanism of free radical halogenation of alkanes. 3.3 Cycloalkanes - Nomenclature methods of formation (a) Internal Wurtz reaction (b) Distillation of calcium or barium salt of dicarboxylic acid. 3.4 Chemical properties of cyclopropane (i) Free radical substitution of chlorine in presence of light. (ii) Action of HBr and conc. H_2SO_4 iii) Catalytic reduction by H_2/Ni	**Students gain an understanding of :** 3.1 Alkanes : Methods of formation with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acid. 3.2 Mechanism of free radical halogenation of alkanes. 3.3 Cycloalkanes - Nomenclature methods of formation (a) Internal Wurtz reaction (b) Distillation of calcium or barium salt of dicarboxylic acid. 3.4 Chemical properties

II. Ni		of cyclopropane to Free radical substitution of chlorine in presence of light. (iii) Action of HBr and (conc. H2SO4)(i) Catalytic reduction by II, Ni
4. Alkenes, Dienes and Alkynes (Contact hrs: 09) Nomenclature of alkenes. Methods of formation of alkenes with mechanism (i) By dehydration of lower alcohols (ii) By dehydrohalogenation of lower alkyl halides. Chemical reactions of alkenes - Hydrogenation, Electrophilic and free radical additions, Hydroboration, Oxidation, Epoxidation, Ozonolysis, Hydration, Hydroxylation, Oxidation with KMnO4, Polymerization of alkenes - ethylene and propylene Nomenclature and classification of dienes. Isolated, Conjugated and cumulated dienes Butadiene: Methods of formation, polymerization, 1,2 and 1,4-additions and Diels-Alder reaction. Alkynes - Nomenclature, Acidity of alkynes. Electrophilic and Nucleophilic addition reactions, Hydroboration, oxidation.	**To study** Nomenclature of alkenes. Methods of formation of alkenes with mechanism (i) By dehydration of lower alcohols (ii) By dehydrohalogenation of lower alkyl halides. Chemical reactions of alkenes - Hydrogenation, Electrophilic and free radical additions, Hydroboration, Oxidation, Epoxidation, Ozonolysis, Hydration, Hydroxylation, Oxidation with KMnO4, Polymerization of alkenes - ethylene and propylene Nomenclature and classification of dienes Isolated, Conjugated and cumulated dienes Butadiene: Methods of formation, polymerization, 1,2 and 1,4-additions and Diels-Alder reaction. Alkynes - Nomenclature, Acidity of alkynes. Electrophilic and Nucleophilic addition reactions, Hydroboration, oxidation.	**Students gain an understanding of :** Nomenclature, methods of preparations, chemical reactions of Alkenes, Dienes and Alkynes.

5. Stereochemistry of organic compounds Types of stereo-isomerism - Optical isomerism, Geometrical isomerism and Conformational isomerism. Chiral center [Explanation with lactic acid] Elements of symmetry Optical Isomerism in lactic acid, tartaric acid and 2,3 - dihydroxybutanic acid Enantiomers and diastereoisomers. Racemic modification. Geometrical isomerism-cause of geometrical isomerism. Geometrical isomerism w.r.t. C = C Geometrical isomerism in maleic acid and fumaric acid.	**To study** Types of stereo-isomerism - Optical isomerism, Geometrical isomerism and Conformational isomerism. Chiral center [Explanation with lactic acid] Elements of symmetry Optical isomerism in lactic acid, tartaric acid and 2,3 - dihydroxybutanic acid Enantiomers and diastereoisomers. Racemic modification. Geometrical isomerism-cause of geometrical isomerism. Geometrical isomerism w.r.t. C = C Geometrical isomerism in maleic acid and fumaric acid.	**Students gain an understanding of :** Types of stereoisomerism, their examples, Enantiomers and diastereoisomers. Racemic modification. Geometrical isomerism-cause of geometrical isomerism. Geometrical isomerism w.r.t. C = C Geometrical isomerism in maleic acid and fumaric acid.
6. Aromaticity and Benzene Meaning of the terms - Aromatic, non-aromatic, antiaromatic and pseudoaromatic compounds. a) Kekule structure of benzene b) Resonance structures of benzene. c) Molecular orbital picture of benzene. d) Representation of benzene ring. 6.3 Modern theory of aromaticity. Fundamental Concepts - delocalisation of electrons, coplanarity and Huckel's (4n + 2) π rule. Applications of Huckel's rule to naphthalene.	**To study** Meaning of the terms - Aromatic, non-aromatic, antiaromatic and pseudoaromatic compounds. a) Kekule structure of benzene b) Resonance structures of benzene. c) Molecular orbital picture of benzene. d) Representation of benzene ring. Modern theory of aromaticity. Fundamental Concepts - delocalisation of electrons, coplanarity and Huckel's (4n + 2) π rule. Applications of Huckel's rule to naphthalene, pyrrole and pyridine. Mechanism of electrophilic aromatic substitution in benzene w.r.t. nitration, sulphonation,	**Students gain an understanding of :** Meaning of different terms. Resonance and Molecular orbital picture of benzene. Fundamental Concepts - delocalisation of electrons. Mechanism of electrophilic aromatic substitution in benzene w.r.t. nitration, sulphonation, halogenation and Friedel - Craft's reaction-alkylation and acylation

Pyrrole and pyridine 6.4 Mechanism of electrophilic aromatic substitution in benzene w.r.t. nitration, sulphonation, halogenation and Friedel - Craft's reaction- alkylation and acylation	halogenation and Friedel - Craft's reaction- alkylation and acylation	

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Chemistry

B.Sc. I

NAME OF SUBJECT: Chemistry

SEM : II

COURSE NUMBER (PAPER NUMBER): P-IV

TITLE OF COURSE (NAME OF PAPER): Analytical Chemistry

COURSE CONTENT	OBJECTIVES	OUTCOME
1. Physical properties of liquids Introduction, additive and constitutive properties 1.2 **Viscosity:** coefficient of viscosity, determination of viscosity by Ostwald's Viscometer **Surface tension:** Determination of surface tension by Drop –Weight method **Parachor:** Macleod equation and its modification by Sugden, applications of parachor in thedetermination of molecular structures as benzene and NO2 group **Dipole moment:** electrical polarization of molecules Use of dipole moment in the study of molecular structure **Refractometery:** Refractive index, Snell's law Specific and molecular refractivity. Abbe's refractometer: Principle-critical angle phenomenon-construction, working and advantages Molecular refractivity and chemical constitution	To understand the properties like Introduction, additive and constitutive properties Viscosity, coefficient of viscosity, determination of viscosity by Ostwald's Viscometer Surface tension:- Determination of surface tension by Drop –Weight method Parachor:-Macleod equation and its modification by Sugden, applications of parachor in the determination of molecular structures as benzene and NO2 group Dipole moment, electrical polarization of molecules Use of dipole moment in the study of molecular structure Refractive index, Snell's law	**Student understands the concepts:** Introduction, additive and constitutive properties Viscosity, coefficient of viscosity, determination of viscosity by Ostwald's Viscometer Surface tension:- Determination of surface tension by Drop –Weight method Parachor:-Macleod equation and its modification by Sugden, application of parachor in the determination of molecular structures as benzene and NO2 group Dipole moment, electrical polarization ofmolecules Use of dipole moment in the study of molecular

		structure 1.7 Refractive index. Snell's law
2. Environmental Chemistry: Air pollution Introduction: Meaning of terms: Environment, Pollution, Pollutant, Threshold Limit Value (TLV), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) Types of Pollution (Only Introduction): Air pollution, Water pollution, Sound pollution, Soil pollution, Automobile pollution and nuclear pollution. Air Pollution: Classification of Air pollutants, Oxides of carbon, Sulphur and Nitrogen as air pollutants with respect to source and health hazards.	**To study** Introduction: Meaning of terms: Environment, Pollution, Pollutant, Threshold Limit Value (TLV), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) Types of Pollution (Only Introduction): Air pollution, Water pollution, Sound pollution, Soil pollution, Automobile pollution and nuclear pollution. Air Pollution: Classification of Air pollutants, Oxides of carbon, Sulphur and Nitrogen as air pollutants with respect to source and health hazards.	**Students gain an understanding of :** Introduction: Meaning of terms: Environment, Pollution, Pollutant, Threshold Limit Value (TLV), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) Types of Pollution (Only Introduction): Air pollution, Water pollution, Sound pollution, Soil pollution, Automobile pollution and nuclear pollution. Air Pollution: Classification of Air pollutants, Oxides of carbon, Sulphur and Nitrogen as air pollutants with respect to source and health hazards.
3. Environmental Chemistry: Water pollution Introduction: Resources of water. Types of water Pollutants, water Pollution and its sources (Brief Account) Treatment of water: A) Potable Water: Parameters of potability of water Step I: Removal of suspended matter : a) Prolonged storage b) Screening c) Sedimentation d) Coagulation e) Filtration Step II: Removal of germs and	**To Study** Introduction: Resources of water. Types of water Pollutants, water Pollution and its sources (Brief Account) Treatment of water: A) Potable Water: Parameters of potability of water Step I: Removal of suspended matter : a) Prolonged storage b) Screening c) Sedimentation d) Coagulation e) Filtration Step II: Removal of germs and bacteria- Physical and Chemical	**Students gain an understanding of :** Step I: Removal of suspended matter a) Prolonged storage b) Screening c) Sedimentation d) Coagulation e) Filtration Step II: Removal of germs and bacteria- Physical and Chemical method. Physical Methods : a) Boiling b) Exposure to UV or Sunlight

bacteria- Physical and Chemical method Physical Methods : a) Boiling b) Exposure to UV or Sunlight c) Distillation. Chemical Method : a) Chlorination b) Fluorination c) Ozonisation d) Aeration e) Use of $KMnO_4$ B) Industrial Water: Mention names of the methods only, Ion exchange method in detail. C) Municipal Sewage: Meaning of Sewage; mention the names of methods; activated sludge process in detail.	method Physical Methods : a) Boiling b) Exposure to UV or Sunlight c) Distillation. Chemical Method : a) Chlorination b) Fluorination c) Ozonisation d) Aeration e) Use of $KMnO_4$ B) Industrial Water: Mention names of the methods only; Ion exchange method in detail. C) Municipal Sewage: Meaning of Sewage; mention the names of methods; activated sludge process in detail.	c) Distillation. Chemical Method : a) Chlorination b) Fluorination c) Ozonisation d) Aeration e) Use of $KMnO_4$ B) Industrial Water: Mention names of the methods only, Ion exchange method in detail. C) Municipal Sewage: Meaning of Sewage; mention the names of methods; activated sludge process in detail.
4. Qualitative and Quantitative elemental analysis Qualitative analysis of Carbon, Hydrogen, Nitrogen & Sulphur Quantitative analysis of - i) Carbon and hydrogen by Combustion method ii) Nitrogen by Kjeldahl's method iii) Halogen and Sulphur by Carius method Determination of molecular weight of an acid by titration method. Empirical formula and molecular formula determination. (Numerical Problems Expected)	**To study** Qualitative analysis of Carbon, Hydrogen, Nitrogen & Sulphur Quantitative analysis of - i) Carbon and hydrogen by Combustion method ii) Nitrogen by Kjeldahl's method iii) Halogen and Sulphur by Carius method. Determination of molecular weight of an acid by titration method. Empirical formula and molecular formula determination. (Numerical Problems Expected)	**Students gain an understanding of :** Qualitative analysis of Carbon, Hydrogen, Nitrogen & Sulphur Quantitative analysis of - i) Carbon and hydrogen by Combustion method ii) Nitrogen by Kjeldahl's method iii) Halogen and Sulphur by Carius method. Determination of molecular weight of an acid by titration method. Empirical formula and molecular formula determination. (Numerical Problems Expected)
5. Petroleum and petrochemicals (Contact hrs: 07) Constituents and refining of petroleum, cracking, knocking, octane, hydro-forming Synthesis and Industrial applications of following petrochemicals: a) Ethylene oxide b) Adipic acid c) Styrene	**To Study** Constituents and refining of petroleum, cracking, knocking, octane, hydro-forming Synthesis and Industrial applications of following petrochemicals: a) Ethylene oxide b) Adipic acid c) Styrene d) 2-Phenyl ethanol e) Paracetamol	**Students gain an understanding of :** Constituents and refining of petroleum, cracking, knocking, octane, hydro-forming Synthesis and Industrial applications of following petrochemicals: a) Ethylene oxide b) Adipic acid

d) 2-Phenyl ethanol e) Paracetamol		c) Styrene d) 2-Phenyl ethanol e) Paracetamol

Signature of HOD
Head of the Department
Chemistry

Principal
Hemuji Chandale College
Shelgaon(R)

Name of Department: Chemistry

B.Sc. II

NAME OF SUBJECT: Organic Chemistry

SEM III

COURSE NUMBER (PAPER NUMBER): P-V

TITLE OF COURSE (NAME OF PAPER): Organic Chemistry

COURSE CONTENT	OBJECTIVES	OUTCOME
o **Spectroscopic Methods Ultra-Violet (UV) absorption :** Introduction to Spectroscopy, Beer – Lambert law (mathematical derivation not expected). Types of electronic transitions, Terms used in UV spectroscopy: Chromophore, Auxochrome, Bathocromic/hypochromic, Hypochromic and Hyperchromic shifts, Effect of conjugation on position of UV and visible bands. Calculation of _max by Woodward-Fieser rules for conjugated dienes and enones. Applications of UV spectroscopy – Determination of structure and stereochemistry (cis and trans) spectral problems based on UV	**To study** Introduction to Spectroscopy, Beer – Lambert law (mathematical derivation not expected). Types of electronic transitions, Terms used in UV spectroscopy: Chromophore, Auxochrome, Bathocromic/hypochromic, Hypochromic and Hyperchromic shifts, Effect of conjugation on position of UV and visible bands. Calculation of _max by Woodward-Fieser rules for conjugated dienes and enones. Applications of UV spectroscopy – Determination of structure and stereochemistry (cis and	**Student understands the concepts:** Beer – Lambert law, Types of electronictransitions, Terms used in UV spectroscopy: Chromophore, Auxochrome, Bathocromic/hypochromic, Hypochromic and Hyperchromic shifts, Effect of conjugation on position of UV and visible bands. **Students are able to solve the problems** related UV spectroscopy.
2. Stereochemistry (8) **Geometrical Isomerism :** Introduction,	**To study the** **2.1. Geometrical**	**Students gain an understanding of :** Types of stereoisomerism, their examples, Enantiomers and

Geometrical isomerism in aldoximes and ketoximes, configuration of ketoximes-Beckmann transformation (Mechanism & Proof are not expected) configuration of aldoximes. **2.2. Conformational Isomerism :** Introduction, conformation of ethane and n-butane and their representation by using Saw-Horse, Fischer (dotted Wedge line) and Newmann's projection formulae. **2.3.** Conformational analysis of ethane and n-butane with the help of energy profile diagrams. **2.4.** Nomenclature – D & L, R & S, E & Z systems	**isomerism :** Introduction, Geometrical isomerism in aldoximes and ketoximes, configuration of ketoximes-Beckmann transformation (Mechanism & Proof are not expected) configuration of aldoximes. **2.2. Conformational Isomerism :** Introduction, conformation of ethane and n-butane and their representation by using Saw-Horse, Fischer (dotted Wedge line) and Newmann's projection formulae. **2.3.** Conformational analysis of ethane and n-butane with the help of energy profile diagrams. **2.4.** Nomenclature – D & L, R & S, E & Z systems	diastereoisomers. Racemic modification. Geometrical isomerism-cause of geometrical isomerism. Geometrical isomerism w.r.t. C = C Geometrical isomerism in maleic acid and fumaric acid
3. Alcohols and Phenols (8) **3.1. Alcohols : Introduction** i. Dihydric alcohols : Nomenclature, Methods of formation of ethylene glycol from ethylene, ethylene dibromide and ethylene oxide, physical properties & chemical reactions of ethylene glycol – acidic nature, reaction with hydrogen halide, oxidation – lead acetate, HIO_4 and nitric acid. Uses of ethylene glycol. Pinacol formation, Pinacol-Pinacolone rearrangement and its mechanism. ii. Trihydric alcohols : Nomenclature, Methods of formation of glycerol – from fats and oils physical properties. Chemical reactions of glycerol –	**To study the** i. Dihydric alcohols : Nomenclature, Methods of formation of ethylene glycol from ethylene, ethylene dibromide and ethylene oxide, physical properties & chemical reactions of ethylene glycol – acidic nature, reaction with hydrogen halide, oxidation – lead acetate, HIO_4 and nitric acid, Uses of ethylene glycol. Pinacol formation, Pinacol-Pinacolone rearrangement and its mechanism. ii. Trihydric alcohols : Nomenclature, Methods of formation of glycerol – from fats and oils physical properties. Chemical reactions of glycerol – reaction with electropositive metals,	**Students gain an understanding of :** To study the acyclic aliphatic and aromatic alcohols Also the study Mono, Di, Tri- hydric alcohols Synthesis of phenols and alcohols Applications of aliphatic and aromatic alcohols

reaction with electropositive metals, reaction with hydrogen halide(HCl and HI Reaction with conc. nitric acid in presence of conc. sulphuric acid. Reactions with potassium hydrogen sulphate, esterification, oxidation. Uses of glycerol. **3.2. Phenols :** Introduction, Reactions of phenol (carbolic acid) : i. Acylation and Fries rearrangement ii. Ether formation and claisen rearrangement iii. Gattermann Synthesis iv. Carboxylation – Kolbe's reaction v. Reimer – Tiemann reaction and its mechanism.	reaction with hydrogen halide(HCl and HI Reaction with conc. nitric acid in presence of conc. sulphuric acid. Reactions with potassium hydrogen sulphate, esterification, oxidation. Uses of glycerol. **3.2. Phenols :** Introduction, Reactions of phenol (carbolic acid) : i. Acylation and Fries rearrangement ii. Ether formation and claisen rearrangement iii. Gattermann Synthesis iv. Carboxylation – Kolbe's reaction v. Reimer – Tiemann reaction and its mechanism.	
4. Aldehydes and Ketones Introduction, Nomenclature, structure and reactivity of the carbonyl group. Mechanism of nucleophilic additions to carbonyl group. Study of following reactions with mechanism 1) Aldol condensation (base catalysed), 2) Perkin reaction, 3) Cannizzaro's reaction, 4) Knoevenagel reaction 5) benzoin condensation.	**To study** Nomenclature, structure and reactivity of the carbonyl group. Mechanism of nucleophilic additions to carbonyl group. Study of following reactions with mechanism 1) Aldol condensation (base catalysed), 2) Perkin reaction, 3) Cannizzaro's reaction, 4) Knoevenagel reaction 5) benzoin condensation.	**Students gain an understanding of :** Nomenclature, structure and reactivity of the carbonyl group. Mechanism of nucleophilic additions to carbonyl group. Study of following reactions with mechanism 1) Aldol condensation (base catalysed), 2) Perkin reaction, 3) Cannizzaro's reaction, 4) Knoevenagel reaction 5) benzoin condensation
5. Ethers and Epoxides **Ethers :** Introduction, Nomenclature, Methods of formation of anisole by Williamson's synthesis and from diazomethane, chemical	**To study** **5.1. Ethers :** Introduction, Nomenclature, Methods of formation of anisole by Williamson's synthesis and from diazomethane, chemical	**Students gain an understanding of :** **Ethers :** Nomenclature, Methods of formation of anisole by Williamson's synthesis and from diazomethane, chemical reactions of anisole with HI, Gravimetric estimation of –OCH3 group by Zeisel's

reactions of anisole with HI. Gravimetric estimation of –OCH3 group by Ziesel's method (Related problems are expected based on % of –OCH3 and number of –OCH3 groups). **5.2. Epoxides** :Introduction, Nomenclature, commercial method of preparation of ethylene oxide. Acid and base catalysed ring opening of ethylene oxide, reactions of Grignard and organolithium reagents with ethylene oxide.	reactions of anisole with HI. Gravimetric estimation of –OCH3 group by Ziesel's method (Related problems are expected based on % of –OCH3 and number of –OCH3 groups) **5.2. Epoxides** :Introduction, Nomenclature, commercial method of preparation of ethylene oxide. Acid and base catalysed ring opening of ethylene oxide, reactions of Grignard and organolithium reagents with ethylene oxide.	method (Related problems are expected based on % of –OCH3 and number of –OCH3 groups). **Epoxides** :Introduction, Nomenclature, commercial method of preparation of ethylene oxide. Acid and base catalysed ring opening of ethylene oxide, reactions of Grignard and organolithium reagents with ethylene oxide.
6. Carboxylic acids (7) Monocarboxylic acids : Introduction. Methods of formation of Halo acids, di- and trichloroacetic acid by HVZ reaction, substitution reactions of monochloroacetic acid by nucleophiles CN–, OH–, I–, and NH3. Hydroxyacids : Malic acid and citric acid, Methods of formation of malic acid from acid and moist Ag2O. Reactions of malic acid – action of heat, oxidation reaction and reaction with HI, uses of malic acid. Methods of formation of citric acid from glycerol. Reactions of citric acid. Acetylation with acetic anhydride reduction by HI. Action of heat at 422oK. Uses of citric acid. Unsaturated acids : Methods of formation of acrylic acid from acrolein and by dehydration of _-hydroxyl	**To study** Monocarboxylic acids : Introduction. Methods of formation of Halo acids, di- and trichloroacetic acid by HVZ reaction, substitution reactions of monochloroacetic acid by nucleophiles CN–, OH–, I–, and NH3. Hydroxyacids : Malic acid and citric acid, Methods of formation of malic acid from acid and moist Ag2O. Reactions of malic acid – action of heat, oxidation reaction and reaction with HI, uses of malic acid. Methods of formation of citric acid from glycerol. Reactions of citric acid. Acetylation with acetic anhydride reduction by HI. Action of heat at 422oK. Uses of citric acid. Unsaturated acids : Methods of formation of acrylic acid from acrolein and by dehydration of _-hydroxyl	**Students gain an understanding of :** Monocarboxylic acids : Introduction. Methods of formation of Halo acids, di- and trichloroacetic acid by HVZ reaction, substitution reactions of monochloroacetic acid by nucleophiles CN–, OH–, I–, and NH3. Hydroxyacids : Malic acid and citric acid, Methods of formation of malic acid from acid and moist Ag2O. Reactions of malic acid – action of heat, oxidation reaction and reaction with HI, uses of malic acid. Methods of formation of citric acid from glycerol. Reactions of citric acid. Acetylation with acetic anhydride reduction by HI. Action of heat at 422oK. Uses of citric acid. Unsaturated acids : Methods of formation of acrylic acid from acrolein and by dehydration of _-hydroxyl propionic acid. Reactions of acrylic acid – Addition of H2O reduction by Na / C2H5OH. Uses of acrylic acid. Methods of formation of cinnamic acid from benzaldehyde using diethyl malonate and by using acetic anhydride and sodium acetate. Reactions of cinnamic acid – bromination, oxidation. Uses of cinnamic acid. Dicarboxylic acids : Succinic and phthalic acids. Methods of formation of succinic acid

propionic acid. Reactions of acrylic acid – Addition of H_2O reduction by Na / C_2H_5OH. Uses of acrylic acid. Methods of formation of cinnamic acid from benzaldehyde using diethyl malonate and by using acetic anhydride and sodium acetate. Reactions of cinnamic acid – bromination, oxidation. Uses of cinnamic acid. **6.4.** Dicarboxylic acids : Succinic and phthalic acids. Methods of formation of succinic acid from ethylene bromide, maleic acid. Reactions of succinic acid – action of heat, action of $NaHCO_3$, C_2H_5OH in presence of acid. Uses of succinic acid. Methods of formation of phthalic acid from o-xylene and naphthalene. Reactions of phthalic acid – action of heat, reaction with sodalime, NH_3. Uses of phthalic acid.	propionic acid. Reactions of acrylic acid – Addition of H_2O reduction by Na / C_2H_5OH. Uses of acrylic acid. Methods of formation of cinnamic acid from benzaldehyde using diethyl malonate and by using acetic anhydride and sodium acetate. Reactions of cinnamic acid – bromination, oxidation. Uses of cinnamic acid. 6.4. Dicarboxylic acids : Succinic and phthalic acids. Methods of formation of succinic acid from ethylene bromide, maleic acid. Reactions of succinic acid – action of heat, action of $NaHCO_3$, C_2H_5OH in presence of acid. Uses of succinic acid. Methods of formation of phthalic acid from o-xylene and naphthalene. Reactions of phthalic acid – action of heat, reaction with sodalime, NH_3. Uses of phthalic acid.	from ethylene bromide, maleic acid. Reactions of succinic acid – action of heat, action of $NaHCO_3$, C_2H_5OH in presence of acid. Uses of succinic acid. Methods of formation of phthalic acid from o-xylene and naphthalene. Reactions of phthalic acid – action of heat, reaction with sodalime, NH_3. Uses of phthalic acid.
7. Diazonium Salts (4) 7.1 Diazoniumsalts : Introduction, benzene diazonium chloride – preparation, chemical properties. i. Formation of iodo benzene ii. Sandmeyer's reaction iii. Formation of benzene iv. Formation of phenylhydrazine v. Azo coupling – synthesis of methyl orange and orange red.	**To study** 7.1 Diazoniumsalts : Introduction, benzene diazonium chloride – preparation, chemical properties. i. Formation of iodo benzene ii. Sandmeyer's reaction iii. Formation of benzene iv. Formation of phenylhydrazine v. Azo coupling – synthesis of methyl orange and orange red.	**Student understands the concepts** 7.1 Diazoniumsalts : Introduction, benzene diazonium chloride – preparation, chemical properties. i. Formation of iodo benzene ii. Sandmeyer's reaction iii. Formation of benzene iv. Formation of phenylhydrazine v. Azo coupling – synthesis of methyl orange and orange red.

Head of the Department
Chemistry

Principal
Hemuji Chandele College

B.A. / B Sc. / M.A. / M S.	
NAME OF SUBJECT	: Inorganic Chemistry
SEM. I / II / III / IV / V / VI	: Sem. III
COURSE NUMBER (PAPER NUMBER)	: P -VI
TITLE OF COURSE (NAME OF PAPER)	: **Inorganic Chemistry**

COURSE CONTENT	OBJECTIVES	OUTCOME
1. Co-ordination Chemistry : 1.1 Definition and terminology of co-ordination covalent bond in the NH_3 and in $[NH_4]^+$ 1.2 Distinction between double salt and complex salt. 1.3 Werner's theory. A) Postulates of theory. B. Applications of theory. Theory applied to cobalt amine viz- a] $CoCl_3.6NH_3$ b] $CoCl_3.5NH_3$, c] $CoCl_3.4NH_3$, d] $CoCl_3.3NH_3$ C. Limitations 1.4 Description of terms –a] ligand, b]co-ordination number, c] co-ordination sphere, d]effective atomic number, e] Geometrical isomerism and optical isomerism in co-ordination compounds for CN = 4 and CN = 6. 1.5 IUPAC nomenclature of co-ordination compounds. 1.6 Valence bond theory of transition metal complexes A. Introduction B. Postulates of VBT/ basic concepts of VBT C. Role of transition metal in the formation of complex D. Stepwise process of formation of	1) Students should get knowledge about the nomenclature of compounds 2) Werner's and VBT approach for the bonding and bond. 3) Isomerism and IUPAC nomenclature of co-ordination compounds.	Students should their isomerism and IUPAC

complex : Salient features. E. Applications: High spin and low spin complexes w.r.t. CN = 4 and CN = 6; F. Limitations of Valence bond theory.		
2. Chelation A brief introduction w.r.t. ligand, chelating agent, chelation and metal chelate. Structural requirements of chelate formation. Difference between metal chelate and metal complex. Classification of chelating agents (with specific illustrations of bidentate chelating agent). Applications of chelation w.r.t. chelating agents : EDTA and DMG.	Students should get knowledge about application of coordination chemistry as a chelating agents and metal chelate.	Students have understood about difference between metal complex and metal chelate. Also they understood the applications of chelating agents in our life.
3. Acids and Bases Lewis Concept : A.Definition, B.classification,C. merits and D.demerits. Hard and soft acids and bases (HSAB) : A. Classification of acids and bases as hard and soft. B. Pearson's HSAB concept. C. Acid-Base strength and hardness-softness. D. Applications and limitations of HSAB principle.	1. To develop the thinking of students for acid base concept. 2. To understand various concepts of acids and bases. 3. To help student to classify Hard and soft acids and bases	1. Students are able to distinguish between various examples. 2. Students are able to apply knowledge in various content.
4. Study of d-block elements Introduction. Position of d-block elements in periodic table. Numerical electronic configuration of 1st, 2nd & 3rd three transition series. General Characteristics of 3 d-block elements w.r.t. – a) oxidation state b) colour c) Magnetic behavior (spin only formula)	1. Enable students to distinguish between properties s-block, p-block and d-block element 2. To help the students to understand properties of d-block element 3. To help the students to understand electronic configuration, name symbol atomic number of 1^{st}, 2^{nd}, 3^{rd} transition series elements	1. Students are able to distinguish between properties of s-block, p-block and d- block element 2. Students are able to give properties of d-block element 3. Students are able to give electronic configuration, atomic number , symbol and name of the three transition series element

d) catalytic properties and e) tendency to form complexes. 4.5 Comparison of 1st transition series with 2nd & 3rd transition series w.r.t. a) electronic configuration b) reactivity c) stability of oxidation state d) magnetic behavior and e) stability of complexes (Brief account only)	4. To help the students to understand various properties of 3-d transition series element 5. To help the students to compare properties of three transition series.	4. Students are able to understand the characteristics of various properties of 3-d block element and students can apply those characters in various concept related to 3-d series elements such as co-ordination chemistry, chelation; acid base concept also in research as studies in metal complexes.

Principal
Hemuji Chowdale College
Shelgaon(R) Tal. Karjat Dist. Ahmednagar

Signature of HOD
Head of the Department
Chemistry

B.Sc. II	
NAME OF SUBJECT: Physical Chemistry	
SEM IV	
COURSE NUMBER (PAPER NUMBER) P-VII	
TITLE OF COURSE (NAME OF PAPER): Physical Chemistry	
COURSE CONTENT	**OBJECTIVES**
Electrochemistry 1.1 Introduction, conduction of electricity, Types of conductors	To study 1.1 conduction of electricity, Types of conductors : electronic and electrolytic

electronic and electrolytic. Explanation of terms : Conductance. Specific resistance, specific conductance. Equivalent conductance. Molecular conductance. Variation of specific and equivalent conductance with concentration. Equivalent conductance at infinite dilution. (Mention Onsager equation, $\Lambda_c v = -x\lambda$ from graph) Migration of ions, Hittorf's rule, Transport number. Determination of transport number by moving boundary method. factors influencing transpon number: Nature of electrolyte, concentration, temperature, complex formation and Degree of hydration. Kohlrausch law, Applications of Kohlrausch law : i. Determination of relationship between ionic conductance, ionic mobility and transport number. ii. Determination of equivalent conductance at infinite dilution of weak electrolytes. iii. Determination of degree of dissociation of weak electrolyte. iv. Determination of ionic product of water. v. Determination of solubility of sparingly soluble salts. 1.6. Numerical problems.	Explanation of terms : Conductance. Specific resistance, specific conductance. Equivalent conductance. Molecular conductance. Variation of specific and equivalent conductance with concentration. Equivalent conductance at infinite dilution. (Mention Onsager equation, $\Lambda_c v = -x\lambda$ from graph) Migration of ions, Hittorf's rule, Transport number. Determination of transport number by moving boundary method. factors influencing transpon number: Nature of electrolyte, concentration, temperature, complex formation and Degree of hydration. Kohlrausch law, Applications of Kohlrausch law : i. Determination of relationship between ionic conductance, ionic mobility and transport number. ii. Determination of equivalent conductance at infinite dilution of weak electrolytes. iii. Determination of degree of dissociation of weak electrolyte. iv. Determination of ionic product of water. v. Determination of solubility of sparingly soluble salts. **To solve** 1.6. Numerical problems.	Explanation resistance, spe conductance. Molecular con Variation conductance conductance a dilution. (Men λ from graph) Migration o number. Deter moving bound method, factor Nature of elect complex formation and Kohl Rausch law : i. Determinat conductance, ii. Determinati infinite dilutio iii. Determinat weak electroly iv. Determinat v. Determinat salts. Student becom problems base
2. Thermodynamics Introduction, concept of entropy, Entropy as a state function: Definition, mathematical expression, unit, physical significance of entropy. Entropy changes for reversible and irreversible processes in isolated systems. Entropy changes for an ideal gas as a function of V and T and as a function of P and T. Entropy change in mixing of gases. Entropy change in physical transformations :	**To study** concept of entropy. Entropy as a state function: Definition, mathematical expression, unit, physical significance of entropy. Entropy changes for reversible and irreversible processes in isolated systems. Entropy changes for an ideal gas as a function of V and T and as a function of P and T. Entropy change in mixing of gases. Entropy change in physical transformations :	**Students gain** concept of function: Definitio unit,physical s Entropy cha irreversible pro Entropy cha of V and T and P and T. Entropy cha Entropy cha i. Fusion of a s ii. Vaporizatio

i. Fusion of a solid. ii. Vaporization of a liquid. iii. Transition from one crystalline form to another. Third law of thermodynamics, Absolute entropy and Evaluation of absolute entropy, use of absolute entropies: Determination of entropy changes in chemical reactions. Numerical problems.	i. Fusion of a solid. ii. Vaporization of a liquid. iii. Transition from one crystalline form to another. Third law of thermodynamics, Absolute entropy and Evaluation of absolute entropy, use of absolute entropies: Determination of entropy changes in chemical reactions. **To solve** Numerical problems.	iii. Transition f 2.6. Third law entropy and Ev absolute entrop Determination reactions. Students gain problems.
Physical properties of liquids Introduction, additive and constitutive properties **Viscosity:** coefficient of viscosity, determination of viscosity by Ostwald's Viscometer **Surface tension:** Determination of surface tension by Drop –Weight method **Parachor:** Macleod equation and its modification by Sugden, applications of parachor in the determination of molecular structures as benzene and NO2 group. **Dipole moment:** electrical polarization of molecules. Use of dipole moment in the study of molecular structure **Refractometry:** Refractive index. Snell's law Specific and molecular refractivity. Abbe's refractometer: Principle-critical angle phenomenon-construction, working and advantages Molecular refractivity and chemical constitution	To understand basic concepts of viscosity, S.T,parachore, dipole moment refractive index, etc.	Student should course.

Principal
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Shegaon(M.S.) Tal Basmath Dist-Solapur

Signature of HOD
Head of the Department
Chemistry

B.A. / B.Sc. / M.A. / M.Sc.	: B.Sc. II
NAME OF SUBJECT	: Inorganic Chemistry

SEM I / II / III / IV / V / VI	: Sem. IV
COURSE NUMBER (PAPER NUMBER)	: VIII
TITLE OF COURSE (NAME OF PAPER)	: **Analytical and Industrial Inorganic Chemistry**

COURSE CONTENT	OBJECTIVES	OUTCOME
1. Volumetric Analysis : Introduction, Terminology :- Titrant; Titrand, standard solution; Titration Indicator, Equivalence point; End point,Primary standard ,Secondary standard, Strength of solution, volumetric analysis & their types. Acid Base Titration i) Introduction ii) Theory of Acid-Base indicator :- A) Colour change Interval B) Theories-Ostwald's theory &Quinoid theory. iii) Neutralization curve and choice of indicator for following titrations : A) Strong acid and Strong Base B) Strong Acid and Weak Base C) Weak Acid and Strong Base 1.3 Complexometric titration : A) General account, B) Types of EDTA Titrations, C) Metallochromic Indicator w.r.t. Eriochrome Black-T	1. To help the students to understand various concepts of volumetric analysis 2. to help the students to understand different types of volumetric analysis 3. to help the students to understand various types of acid base reactions	1. Students are able to understand various type of volumetric analysis 2. Students are able to distinguish between types of titrations 3. Students are able to apply knowledge in various fields of chemistry
2. Gravimetric Analysis: Introduction, Terminology :- Gravimetric analysis, Saturation, Super-saturation, Sol, Gel, Coagulation or Flocculation, Coagulation or Flocculation value, Peptization, Precipitation, Precipitate, Precipitant, Solubility, Aging or digestion, Ignition. General steps involved in gravimetry Precipitation – A) Physical nature of Precipitate: Gelatinous, Curdy and Crystalline. B) Conditions of Precipitation 2.4. Process of precipitation – A) Nucleation B) Crystal growth C)	1. To enable students to understand various concept of gravimetric analysis 2. to enable students to understand steps in gravimetric analysis 3. to help the students to understand various applications of gravimetric analysis in field of chemistry	1. Students understood various concept of gravimetric analysis 2. Students understood steps of gravimetric analysis 3. Students are able to apply gravimetric analysis in various field of chemistry

Digestion Co-precipitation and Post precipitation and their difference. Role of Organic precipitants in gravimetric analysis. Study of organic precipitants viz. A) DMG, B) Aluminon, C) 8-Hydroxyquinoline 2.8. Advantages and disadvantages of organic precipitants.		
3. Industrial heavy Chemicals: Introduction Physicochemical Principles & manufacture of following heavy chemicals: i) Ammonia by Haber process ii) Sulphuric acid by contact process.	To help the students to understand heavy chemicals such as ammonia, sulphuric acid.	Students understood the concept of manufacturing of heavy chemicals.
4. Metallurgy: Introduction: Terminology:- Metallurgy, Mineral, Ore, Gangue, Flux, Slag. Occurrence of metals: Types of ores Steps involved in metallurgical processes: A) Concentration of ores- I. Physical methods: a) Gravity separation method, b) Magnetic separation method, c) Froth flotation process. II. Chemical Methods: a) Calcination b) Roasting B) Reduction- i) Chemical methods of reduction ii) Electrolytic reduction method for e.g. Aluminium and copper	Students should get knowledge about; The concept of Metallurgy, occurrence of metals and their separation methods.	Students understood the existence of metallic elements and the types of their compounds in the nature. They also learn the principle and methodology of separation techniques of metals.
5. Iron and Steel: Occurrence of Iron Extraction of Iron: Blast furnace Types of Iron Steel- A) Definition B) Types of Steel C) Manufacture of Steel: a) Bessemer process b) L. D. process	Students should get knowledge about; Chemistry of iron and their compound.	Students understood the occurrence of iron, their separation from source and preparation of steel from cast iron.

D) Heat treatment on Steel		

Principal
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Head of the Department
Chemistry

COURSE OUTCOME

Name of Department: Chemistry

B.Sc. III		
NAME OF SUBJECT: Physical Chemistry		
SEM V		
COURSE NUMBER (PAPER NUMBER) P-IX		
TITLE OF COURSE (NAME OF PAPER): Analytical and Industrial Physical Chemistry		
COURSE CONTENT	**OBJECTIVES**	**OUTCOME**
Phase Equilibri Introduction Gibbs phase rule : Phase rule equation and explanation of terms involved in the equation. 1.3 Phase diagram, true and metastable equilibria. 1.4 One component systems : (i) Water system (ii) Sulphur system with explanation for polymorphism. 1.5 Two component systems : (i) Eutectic system : (Ag - Pb system), Desilverisation of lead, (ii) Formation of compound with congruent melting point (FeCl) - H(O)s	To understand the basic knowledge about homogeneous ,heterogeneous reactions, Gibbs' phase rule one and two components systems	Student should able to apply the phase rule to various systems and should explain.
Photochemistry. [12] 3.1 Introduction 3.2 Difference between thermal and photochemical processes. 3.3 Laws of photochemistry : Grotthus - Draper law,	To understand the basic knowledge about Difference between thermal and photochemical processes. 3.3 Laws of photochemistry : Grotthus - Draper law, Lambert law, Lambert - Beer's law (with derivation), Stark -	i)At the end of the course, the student will be able to explain basic concept of Quantum yield, Photosensitized reactions, Jablonski diagram ii)Student should understand the basic concepts and satisfied. Solve the problems.

Lambert law, Lambert - Beer's law (with derivation), Stark - Einstein law. Quantum yield, Reasons for high quantum yield (e.g. H_2 - Cl_2) and low quantum yield. (e.g. Decomposition of HI and HBr). Photosensitized reactions - Dissociation of H_2, Photosynthesis. Photodimerisation of anthracene. Jablonski diagram depicting various processes occurring in the excited state : Qualitative description of fluorescence and phosphorescence. Chemiluminescence. Numerical problems. ***Reference Books:***	Einstein law. 3.4 Quantum yield, Reasons for high quantum yield (e.g. H_2 - Cl_2) and low quantum yield. 5 Photosensitized reactions - Dissociation of H_2, Photosynthesis. Photodimerisation of anthracene. Jablonski diagram depicting various processes occurring in the excited state : Qualitative description of fluorescence and phosphorescence. Chemiluminescence. Numerical problems.	
Electro chemistry Introduction Thermodynamics of electrode potentials, Nernst equation for electrode and cell potentials in terms of activities. Types of electrodes : Description in terms of construction, representation, half cell reaction and emf equation for, i) Metal - metal ion electrode. ii) Amalgam electrode. iii) Metal - insoluble salt electrode. iv) Gas - electrode. v) Oxidation - Reduction electrode. 2.4 i) Reversible and Irreversible cells. ii) Chemical cells without transference. iii) Concentration cells a. Electrode concentration cell I) Reversible to cation II) Reversible to anion	**To know the basic concept of** Introduction Thermodynamics of electrode potentials, Nernst equation for electrode and cell potentials in terms of activities. Types of electrodes : Description in terms of construction, representation, half cell reaction and emf equation for, i) Metal - metal ion electrode. ii) Amalgam electrode. iii) Metal - insoluble salt electrode. iv) Gas - electrode. v) Oxidation - Reduction electrode. 2.4 i) Reversible and Irreversible cells. ii) Chemical cells without transference. iii) Concentration cells a. Electrode concentration cell I) Reversible to cation II) Reversible to anion b. Electrolyte concentration cells without transference	**Students will** basic concept Thermody Nernst equati cell potentials Types of construction, reaction and i) Metal - me electrode. iii) Metal - in electrode. v) Oxidation - 2.4 i) Reversi ii) Chemical iii) Concentra a. Electrode I) Reversible II) Reversible b. Electrolyte transference

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Chemistry

B.A. / B.Sc. / M.A. / M.Sc. : **B.Sc. III**

NAME OF SUBJECT : Inorganic Chemistry SEM I

SEM I / II / III / IV / V / VI : Sem. V

COURSE NUMBER (PAPER NUMBER) : **X**

TITLE OF COURSE (NAME OF PAPER) : **Inorganic Chemistry**

COURSE CONTENT	OBJECTIVES	OUTCOME
Metal Ligand Bonding in Transition Metal Complexes 1 **A) Crystal Field Theory (CFT)-** 1.A.1) Introduction - What is CFT? 1.A.2) Basic concept of CFT. 1.A.3) Formation of complexes with Crystal field splitting of 'd' orbitals i. Shapes of d orbitals and their electron density region ii. Formation of octahedral Complex with Crystal field splitting of 'd' orbitals, e.g. High spin and low spin octahedral complexes of Co(III) $[CoF_6]^{3-}$, $[Co(NH_3)_6]^{3+}$. iii. Formation of tetrahedral Complex with Crystal field splitting of 'd' orbitals, e.g. $[CoCl_4]^{2-}$. iv. Formation of square planar Complex with Crystal field splitting of 'd' orbitals e.g. $[Co(CN)_4]^{2-}$. 1.A.4. Jahn - Tellar distortion. 1.A.5. Factors affecting the Crystal - field splitting. 1.A.6. Crystal field stabilization energy (A): Calculation for octahedral	1. Enable students to understand various theories of metal ligand bonding in transition metal complex 2. To help the students to understand crystal field theory , concept of CFT, shapes of d-orbital, formation of complexes – octahedral complex and square planar complexes 3. To help the students to understand Molecular orbital theory , concepts, formation of octahedral complex	1. Students understood nature of metal ligand bonding in metal complexes and the characteristics of coordinate compounds on the basis of CFT and MOT.

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complexes only. 1.A.7. Applications and limitations of CFT. **B) Molecular Orbital Theory (MOT).** 1.B.1. Introduction. 1.B.2. Basic concept 1.B.3. Symmetry classes of atomic orbitals 1.B.4. Formation of octahedral complex a) Assumptions b) M.O. energy level diagram for hypothetical octahedral complex. 1.B.5. Examples: octahedral complexes with sigma bonding only such as- e.g.$[Ti(H_2O)_6]^{3+}$, $[FeF_6]^{3-}$, $[Fe(CN)_6]^{3-}$, $[CoF_6]^{3-}$, $[Co(NH_3)_6]^{3+}$, $[Ni(NH_3)_6]^{2+}$ 1.B.6. Applications and limitations of MOT. 1.B.7. Comparison between CFT AND MOT		
Nuclear Chemistry: 2.1. Nuclear reaction and energetics of nuclear reactions. 2.2. Classification of nuclear reactions and Types of nuclear reactions: a) Artificial transmutation. b) Artificial radioactivity. iii) Projectile capture reaction. iv) Projectile capture - particle emission reaction. v) Nuclear fission. vi) Nuclear fusion. 2.3. Use of Uranium,- Thorium and Plutonium for- a. Nuclear reactor b. Atomic Bomb. 2.4. Applications of radioisotopes as tracers. i) Chemical investigation - Esterification. ii) Structural determination - Phosphorus pentachloride. iii) Analytical Chemistry - isotopic dilution method for determination of volume of blood. iv) Age determination - Dating by C^{14}	1. To help the students to understand nuclear reactions 2. To help the students to understand difference between chemical reactions and nuclear reactions 3. To help the students to understand various types of nuclear reactions 4. To help the students to understand applications of nuclear reactions in energy production 5. To help the students to understand applications of radioactivity in various fields	1. Students understood nuclear reactions, difference between chemical and nuclear reactions 2. Students understood various types of chemical reactions and their beneficial characteristic 3. Students understood application of nuclear reactions 4. Students can apply radioactive techniques in various fields
Bioinorganic Chemistry: 3.1. Essential and trace elements in biological process. i) Essential	1. Enable students to understand requirement of essential and trace elements in	1. Students understood role of essential and trace elements in biological process 2.

elements a) Macro / major elements b) Microtrace/minor elements ii) Non-essential elements 3.2. Metalloporphyrins with special reference to haemoglobin and myoglobin: i) Structure of Haemoglobin(Hb) ii) Structure of Myoglobin (Mb) iii) Function of Haemoglobin (Hb) and Myoglobin (Mb) as Oxygen transport from lungs to tissues iv) Function of Haemoglobin as Carry back CO_2 to lungs v) Co-operativity vi) Oxygen binding curve vii) Difference between Haemoglobin (Hb) and Myoglobin (Mb) 3.3. Role of alkali and alkaline earth metal ions with special reference to Na^+, K^+ and Ca^{2+} i) Role of Na^+ and K^+ ii) Role of Ca^{2+}	biological processes as major and minor element 2. Enable students to understand structure of hemoglobin myoglobin, function of hemoglobin, myoglobin 3. Help the students to understand role of alkali and alkaline earth metal	Students understood structure of hemoglobin and myoglobin 3. Students understood role of alkali and alkaline earth metal ions
Catalysis 4.1. Introduction 4.2. Classification of catalytic reactions : Homogeneous & Heterogeneous 4.3. Types of catalysis 4.4. Characteristics of catalytic reactions 4.5. Mechanism of catalysis : i) Intermediate compound theory ii) Adsorption theory. 4.6. Industrial Applications of Catalysis.	1. To help the students to understand about catalyst 2. Enable students to understand various types of catalytic reactions 3. To help the students to understand various types of catalysis 4. To help the students to understand mechanism of catalysis 5. Enable students to understand various industrial applications of catalyst	1. Students are able to understand about catalyst 2. Students are able to understand various types of catalytic reactions 3. Students are able to understand various types of mechanism of catalysis 4. Students are able to apply catalyst in various field and various branches of chemistry and other field
Fertilizers 5.1. Nutrient Functions in plant growth : Nitrogen, Phosphorous, Potassium, Calcium, Magnesium, Sulphur, Boron, Iron, Zinc, Manganese, Copper, Molybdenum, Chlorine, Role of these nutrients as : Functions, Excess supply and Deficiency. 5.2. Definition and qualities of an	1. Enable students to understand various nutrient required for plant growth 2. Enable students to understand definition, qualities of fertilizer 2. To help the students to understand manufacturing process of various fertilizer	1. Students understood various plant nutrient 2. Students understood definition, qualities of various fertilizer 3. Students can apply these manufacturing process in analytical chemistry

Ideal fertilizers. 5.3. Classification or types of fertilizers. 5.4. Manufacture of fertilizers, eg. Urea, Ammonium sulphate, Superphosphate, Triple superphosphate, Ammonium phosphate. 5.5. Mixed fertilizers, Compound or complex fertilizers. 5.6. Pollution caused by fertilizers		

Head of the Department
Chemistry

B.Sc. III

NAME OF SUBJECT: Organic Chemistry

SEM : V

COURSE NUMBER (PAPER NUMBER): P- XI

TITLE OF COURSE (NAME OF PAPER): OrganicChemistry

COURSE CONTENT	OBJECTIVES	OUTCOME
I Spectroscopic Method. [20] **1.1. Infrared Spectroscopy :** 1.1.1 Introduction, 1.1.2 Principle of IR spectroscopy, 1.1.3 Double beam IR spectrophotometer- Schematic diagram, 1.1.4 Fundamental modes of vibration, 1.1.5 Types of vibration 1.1.6 Hooke's law, 1.1.7 factors affecting values of vibrational frequencies, 1.1.8 conditions for absorption of radiation and selection rule, 1.1.9 fundamental group regions of IR spectrum, 1.1.10 Functional group region, Finger print region, 1.1.11 characteristic absorption of various functional groups, 1.1.12 Applications of IR spectroscopy – Determination of structure, Identification offunctional groups spectral problems based on IR **1.2 NMR Spectroscopy** 1.2.1 Introduction 1.2.2 Proton magnetic resonance (1H) spectroscopy (PMR). 1.2.3 Principles of PMR	**To study the:** 1.1.2 Principle of IR spectroscopy, 1.1.3 Double beam IR spectrophotometer- Schematic diagram, 1.1.4 Fundamental modes of vibration, 1.1.5 Types of vibration 1.1.6 Hooke's law, 1.1.7 factors affecting values of vibrational frequencies, 1.1.8 conditions for absorption of radiation and selection rule, 1.1.9 fundamental group regions of IR spectrum, 1.1.10 Functional group region, Finger print region, 1.1.11 characteristic absorption of various functional groups, 1.1.12 Applications of IR spectroscopy – Determination of structure, Identification of functional groups spectral problems based on IR. **To solve** 1.6 Spectral problems based on IR. **1.2 NMR Spectroscopy** 1.2.2 Proton magnetic resonance (1H) spectroscopy (PMR). 1.2.3 Principles of PMR spectroscopy, 1.2.4 Magnetic and non-magnetic	**Students gain :** All spectroscopic factors on IR and Applications of Determination of functional groups IR **Students gain :** Theory of PMR Shielding and de Chemical shift, by delta scale and TMS as referenc Peak area (integ Spin - spin split Definition of coupl **Students are ab** Problems pertaining of simple organic PMR spectroscopicUV data to be g

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spectroscopy. 1.2.4 Magnetic and non-magnetic nuclei. 1.2.5. Theory of PMR spectroscopy - spinning nuclei, magnetic moment and magnetic field, precessional motion of nuclei without mathematical details, nuclear resonance. 1.2.6 NMR - Instrument. Schematic diagram. 1.2.7. Shielding and deshielding. 1.2.8. Chemical shift, measurement of chemical shift), by delta scale and tau scale. 1.2.9. TMS as reference. Advantages of TMS. 1.2.10. Peak area (integration) 1.2.11. Spin - spin splitting (n + 1 rule). 1.2.12. Definition of coupling constant (J value) of first order coupling. 1.2.13. PMR spectra of ethanol, ethyl bromide, acetaldehyde, 1, 1, 2 - tribromoethane, ethyl acetate, acetophenone ,benzaldehyde, propanoic acid and benzoic acid 1.2.14. Problems pertaining to the structure elucidation of simple organic compounds using PMR spectroscopic data (supporting IR and UV data to be given).	nuclei. 1.2.5. Theory of PMR spectroscopy - spinning nuclei, magnetic moment and magnetic field, precessional motion of nuclei without mathematical details, nuclear resonance. 1.2.6 NMR - Instrument. Schematic diagram. 1.2.7. Shielding and deshielding. 1.2.8. Chemical shift, measurement of chemical shift by delta scale and tau scale. 1.2.9. TMS as reference. Advantages of TMS. 1.2.10. Peak area (integration) 1.2.11. Spin - spin splitting (n + 1 rule). 1.2.12. Definition of coupling constant (J value) of first order coupling. 1.2.13. PMR spectra of ethanol, ethyl bromide, acetaldehyde, 1, 1, 2 tribromoethane, ethyl acetate, acetophenone ,benzaldehyde, propanoic acid and benzoic acid 1.2.14. Problems pertaining to the structure elucidation of simple organic compounds using PMR spectroscopic data (supporting IR and UV data to be given).	
1.3 Mass spectroscopy. 1.3.1 Introduction. 1.3.2 Theory of mass spectroscopy 1.3.3 Mass spectrometer - schematic diagram 1.3.4 Formation of ions by ionization 1.3.5 Types of ions with examples. 1.3.6. Applications of mass spectroscopy. i) Determination of molecular weight ii)	To study, Introduction and Theory of mass spectroscopy, Instrumentation of Mass spectrometer, Formation of ions, Types of ions, Applications of mass spectroscopy	Student got under Mass spectroscop Instrumentation, Ion formation, Types of ions, Applications

Determination of molecular formula.		
2. Stereochemistry	•To understand the concept of stereochemistry	• Students able to
A) Introduction. B) Baeyer's strain theory. C) Theory of strainless rings. D) Conformation and stability of cyclohexane and monosubstitutedcyclohexanes – methyl cyclohexane. E) Locking of conformation in t-butyl cyclohexane. F) Stereoselective and stereospecific reactions : i) Stereochemistry of addition of halogens to alkenes:syn and anti addition. Example - Addition of bromine to 2-butene. (mechanism not expected) ii) Alkaline hydrolysis of 2-chlorobutane to 2-butanol(Example of SN_2 reaction	•How calculate the angle and stability of cyclic compounds by Baeyer theory. •Effect of large groups in cyclic compounds. •Using stereochemistry, stereoselective and stereospecific reactions and stereochemical different products formation with different examples.	various types of strai • Students know and why there is energy (more stab • Students unders compound with larg compounds. • Students underst stereoselective and what is meaning products.
3. Name reactions. Mechanism and applications of following reactions : 3.1 Stobbe condensation. 3.2 Oppenauer oxidation. 3.3 MeerweinPonndorfVerley reduction. 3.4 Reformatsky reaction. 3.5 Wagner - Meerwein Rearrangement. 3.6 Hofmann rearrangement reaction. 3.7 Wittig reaction. 3.8 Related problems.	To study, Mechanism and applications of following reactions : Stobbe condensation. Oppenauer oxidation. MeerweinPonndorfVerley reduction. Reformatsky reaction. Wagner - Meerwein Rearrangement. Hofmann rearrangement reaction. Wittig reaction. Related problems.	Students gain i Mechanism and following reacti Stobbe condensation. Oppenauer oxidation. MeerweinPonndor Reformatsky rea Wagner - Meerw Hofmann rearra Wittig reaction. Related problems.
4. Organic synthesis via Enolates 4.1 Introduction - Reactive methylene group. 4.2 Ethyl acetoacetate - synthesis by Claisencondensation, acidity of methylene hydrogen (salt formation), Keto-enol tautomerism, synthetic applications - Synthesis of	**To study** 4.1 Introduction - Reactive methylene group. 4.2 Ethyl acetoacetate - synthesis by Claisen condensation, acidity of methylene hydrogen (salt formation), Keto-enol tautomerism, synthetic applications - Synthesis of alkyl and dialkyl derivatives.	**Students gain i** Basic terms invol • Types and subsyintermediates in - To study the re Ethyl acetoacetate condensation, ac • hydrogen (salt f • Also study of cond

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alkyl and dialkyl derivatives, monobasic, dibasic and α- β- unsaturatd acid, heterocyclic compound. 4.3 Diethyl malonate - Synthesis, acidity of methylene hydrogen (salt formation). Synthetic applications - Synthesis of alkyl and dialkyl derivatives, monobasic , dibasic acid, α- β- unsaturated acid, α-amino acid and heterocyclic compound.	monobasic, dibasic and α- β- unsaturated acid, heterocyclic compound. 4.3 Diethyl malonate - Synthesis, acidity of methylene hydrogen (salt formation). Synthetic applications - Synthesis of alkyl and dialkyl derivatives, monobasic , dibasic acid, α- β- unsaand heterocyclic compoundaturated acid, α- amino acid	organic synthesis

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Chemistry

B.Sc. III

NAME OF SUBJECT: Physical Chemistry

SEM V

COURSE NUMBER (PAPER NUMBER) P-XII

TITLE OF COURSE (NAME OF PAPER): Analytical and Industrial Physical Chemistry

COURSE CONTENT	OBJECTIVES	OUTCOME
Potentiometry: 1) Introduction. 2) Detail study of calomel, quinhydrone and glass electrodes and their use in determination of ph 3) Potentiometric titrations: Classical and Analytical methods for locating end points. I)Acid –Base titrations. II)Redox Titrations. III)Precipitation titrations. 4) Advantages of Potentiogetric titrations 5) Basic circuit of direct reading potentiometer	Detail study of calomel, quinhydrone and glass electrodes and their use in determination of ph Potentiometric titrations. Classical and Analytical methods for locating end points. Types of potentiometric titrations Acid –Base, Redox and Precipitation titrations. Advantages of Potentiometric titrations	Student should able to know various types of electrodes as reference and indicator electrodes To study the end points of reactions by potentiometric titrations
Flame Photometry: 1) General Principles. 2) Instrumentation: Block diagram,Burners: Total consumption burner, liminor flow burner and Lundergarph burner, mirror, slits, monochromators, filters and detectors. 3) Applications in qualitative and quantitative analysis. 4) Limitations of flame photometry	Principle Various components of flame photometry Burners: Total consumption burner, liminor flow burner and Lundergarph burner, mirror, slits, monochromators, filters and detectors. Applications in qualitative and quantitative analysis. Limitations of flame photometry	The students can know the basic knowledge of flame photometry as analytical techniques
Electroplating 3.1 Introduction 3.2 Electrolysis, Faraday's laws, Cathode current efficiency. 3.3 Basic principles of electroplating, cleaning of articles. 3.4 Electroplating of	**To study** 3.2 Electrolysis, Faraday's laws, Cathode current efficiency. 3.3 Basic principles of electroplating, cleaning of articles. 3.4 Electroplating of Nickel and	**Student understands the concepts:** 3.2 Electrolysis, Faraday's laws, Cathode current efficiency. 3.3 Basic principles of electroplating, cleaning of

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Nickel and Chromium. 3.5 Anodising	Chromium. 3.5 Anodising	articles. 3.4 Electroplating of Nickel and Chromium. 3.5 Anodising

1. Colorimetry. 1.1 Introduction 1.2 General diuqussion of theory of colorimetry : Lambert law, Beer's law (Derivation not expected), Terms used in Colorimetry, Application of Beer's law, Devition from Beer's law. 1.3 Classification of methods of 'colour' measurement or comparison, Photoelectric photometer method - single cell photo-electric colorimeter	information about functioning of Colorimeter,its use in measuring concentration of unknown solutions which improves their practical skills	Students will learn functioning of Colorimeter,improving their skills in practicals by working with the machine in determining the concentration of unkown solutions
Conductometry: 5.1 Measurement of conductance by Wheatstone bridge. Basic circuit of D.C. Wheatstone bridge, use of alternating current, conductivity water, Different types of conductivity cells, cell constant and its determination. Experimental determination of specific, equivalent and molecular conductance's. 5.2 Conductometric acid-base titrations i. Strong acid against strong base ii. Strong acid against weak base iii. Weak acid against strong base, iv. Weak acid against weak base. 5.3 Advantages of conductometric titrations	**To study** 5.1 Measurement of conductance by Wheatstone bridge, Basic circuit of D.C. Wheatstone bridge, use of alternating current, conductivity water, Different types of conductivity cells, cell constant and its determination. Experimental determination of specific, equivalent and molecular conductance's. 5.2 Conductometric acid-base titrations i. Strong acid against strong base ii. Strong acid against weak base iii. Weak acid against strong base. iv. Weak acid against weak base. 5.3 Advantages of conductometric titrations	**Students gain an understanding of :** 5.1 Measurement of conductance by Wheatstone bridge, Basic circuit of D.C. Wheatstone bridge, use of alternating current, conductivity water, Different types of conductivity cells, cell constant and its determination. Experimental determination of specific, equivalent and molecular conductance's. 5.2 Conductometric acid-base titrations i. Strong acid against strong base ii. Strong acid against weak base iii. Weak acid against strong base. iv. Weak acid against weak base. 5.3 Advantages of

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		conductometric titrations

B.Sc. III		
NAME OF SUBJECT: Physical Chemistry		
SEM VI		
COURSE NUMBER (PAPER NUMBER) : P-XIII		
TITLE OF COURSE (NAME OF PAPER): Physical Chemistry		
COURSE CONTENT	**OBJECTIVES**	
Spectroscopy 1.1 Introduction 1.2 Electromagnetic radiation. 1.3 Electromagnetic spectrum. Energy level diagram. 1.4 Rotational spectra of diatomic molecules : Rigid rotor model; moment of inertia (derivation not expected); energy levels of rigid rotor, selection rule; spectral intensity; distribution using population distribution (Maxwell - Boltzman distribution). determingtion of bond length; isotope effect. Interaction of radiation with rotating molecule. 1.5 Vibrational spectra of diatomic molecules : Simple Harmonic oscillator model, Vibrational energies of diatomic molecules. Determination of force constant, overtones. Interaction of radiation with vibrating molecules.	**To study the:** 1.2 Electromagnetic radiation. 1.3 Electromagnetic spectrum. Energy level diagram. 1.4 Rotational spectra of diatomic molecules : Rigid rotor model; moment of inertia (derivation not expected); energy levels of rigid rotor, selection rule; spectral intensity; distribution using population distribution (Maxwell - Boltzman distribution). determination of bond length; isotope effect. Interaction of radiation with rotating molecule. 1.5 Vibrational spectra of diatomic molecules : Simple Harmonic oscillator model, Vibrational energies of diatomic molecules. Determination of force constant, overtones. Interaction of radiation with vibrating molecules. **To solve** 1.6 Numerical problems.	**Students gain the** 1.2 Electromagneti 1.3 Electromagneti diagram. 1.4 Rotational spec Rigid rotor model; not expected); ener selection rule; spec population distribut distribution), determi isotope effect. Inter rotating molecule. 1.5 Vibrational spec Simple Harmonic osc energies of diatomic force constant, over radiation with vibra **Students are able** 1.6 Numerical problem
Solution 2.1 Introduction 2.2 Ideal solutions, Raoult's law, vapour pressure of ideal and non ideal	To understand the basic concept of Normality, Molarity, Molality, Mole fraction. 2.1 Introduction 2.2	**Students will gain** basic concept of Nor Mole fraction, Raoult' Raoult's law

solutions of miscible liquids. 2.3 Vapour pressure and boiling point diagrams of miscible liquids. Type I : Systems with intermediate total vapour pressure. (i.e. System in which B.P. increases regularly - Zeotropic) Type II : Systems with a maximum in the total vapour pressure. (i.e. System with a B.P. minimum - Azeotropic)	Ideal solutions, Raoult's law, vapour pressure of ideal and non ideal solutions of miscible liquids. 2.3 Vapour pressure and boiling point diagrams of miscible liquids. Type I : Systems with intermediate total vapour pressure. (i.e. System in which B.P. increases regularly - Zeotropic) Type II : Systems with a maximum in the total vapour pressure.	2.1 Introduction 2.2 Ideal solutions, of ideal and non ide liquids 2.3 Vapour pressure miscible liquids. Type I : Systems wit pressure. (i.e. System is whic Zeotropic) Type II : Systems

Type III :Systems with a minimum in the total vapour pressure. (i.e. System with a B.P. Maximum - Azeotropic) Distillation of miscible liquid pairs. 2.4 Solubility of partially miscible liquids. (i) Maximum solution temperature type : Phenol - water system. (ii) Minimum solution temperature type :Triethyl amine - water system. (iii) Maximum and minimum solution temperature type : Nicotine - water system	(i.e. System with a B.P. minimum - Azeotropic) Type III :Systems with a minimum in the total vapour pressure. (i.e. System with a B.P. Maximum - Azeotropic) Distillation of miscible liquid pairs. 2.4 Solubility of partially miscible liquids. (i) Maximum solution temperature type : Phenol - water system. (ii) Minimum solution temperature type :Triethyl amine - water system. (iii) Maximum and minimum solution temperature type : Nicotine - water system.	vapour pressure. (i.e. System with a Type III :Systems wit vapour pressure. (i.e. System with a Distillation of misc 2.4 Solubility of pa (i) Maximum solut water system. (ii) Minimum solut amine - water system. • (iii) Maximum and type : Nicotine - water

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B.A. / B.Sc. / M.A. / M.Sc. : **B.Sc. III**

NAME OF SUBJECT : Inorganic Chemistry

SEM I / II / III / IV / V / VI : Sem. VI

COURSE NUMBER (PAPER NUMBER) : **P - XIV**

TITLE OF COURSE (NAME OF PAPER) : **Inorganic Chemistry**

COURSE CONTENT	OBJECTIVES	OUTCOME
1) Study of F-block Elements 1.1 Lanthanides :- I) Introduction II) Electronic configuration III) Occurrence IV) Separation of Lanthanides i) Bulk separation methods ii) Individual separation of lanthanides- Mention names of methods only(Ion exchange method in detail) : 2 Actinides :- I) Introduction II) Electronic configuration III) General Methods of preparation :- a) Neutron-capture followed by β- decay b) Accelerated projectile bombardment method c) Heavy-ion bombardment method 1.3 IUPAC Nomenclature of the Super Heavy Elements with atomic numbers (Z) greater than 100.	1. To help the students to understand about lanthanide and actinide 2. To help the students to understand electronic configuration, occurrence separation techniques of lanthanides 3. To help the students to understand electronic configuration, methods of preparation of trans uranic element	1. Students understand lanthanide and actinides 2. Students understand electronic configuration, separation techniques of lanthanide 3. Students understand preparation techniques of actinide
2) Metals and Semiconductors. 2.1 Introduction 2.2 Properties of metallic solids. 2.3 Theories of bonding in metal. a) Free electron theory. b) Molecular orbital theory (Band theory). 2.4 Classification of solids as conductor, insulators and semiconductors on the basis of band theory. 2.5 Semiconductors: a) Types of	Students should get knowledge about; Metallic solids; bonding in metallic solids and their classification as conductor, insulator and conductor.	Students understood the preparation and conduction mechanism in semiconductor and ceramic superconductors.

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semiconductors - intrinsic and extrinsic semiconductors. b) Applications of semiconductors. 2.6 Superconductors : a) Ceramic superconductors - Preparation and structures of mixed oxide $YBa_2Cu_3O_{7-x}$ b) Applications of superconductors		
3) Structural Chemistry. 3.1 Structural study of following compounds. i) Diborane. ii) Borazine. iii) Xenon compounds → XeF_2, XeF_6, XeO_4 (w.r.t. VBT only.) 3.2 Structural study of Oxides of Sulphur and Phosphorous: a) Oxides of Sulphur : SO_2 and SO_3 b) Oxides of Phosphorous : P_4O_6 and P_4O_{10}	To get Knowledge of structure and bonding of some inorganic halide and oxide compounds.	Students understood the, Hybridization concept, VSEPR theory, structure and bonding in halides and oxides of Xe, S & P.
4) Corrosion and Passivity. **4.1 Corrosion** :- I. Introduction II. Types of corrosion,III. Electrochemical theory of corrosion IV. Factors affecting the corrosion i) Position of metal in emf series. ii) Purity of metal. iii) Effect of moisture. iv) Effect of oxygen. v) Hydrogen over voltage, V. Methods of protection of metals from corrosion. **4.2 Passivity** :- I. Definition. II. Types of passivity. III. Oxide film theory. IV. Application of passivity.	To get knowledge of the concept of corrosion and passivity.	Students understood the, Concept of corrosion and passivity, their effects, protection and applications
5. Organometallic Chemistry.	1. To help the students to understand organometallic compounds 2.	1. Students understand concept of organometallic

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5.1 Introduction - Definition, 5.2 Nomenclature of organometallic compounds. 5.3 Synthesis and structural study of alkyl and aryl compounds of Li, Be and Al. 5.4 Mononuclear carbonyl and nature of bonding in simple metal carbonyls	To help the students to understand synthesis of organometallic compounds	compounds 2. Students understand synthesis of organometallic compounds

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Chemistry

B.Sc. III		
NAME OF SUBJECT: Organic Chemistry		
SEM VI		
COURSE NUMBER (PAPER NUMBER) P-XV		
TITLE OF COURSE (NAME OF PAPER): Organic Chemistry		
COURSE CONTENT	**OBJECTIVES**	OUTCOME
I Heterocyclic compounds 1.1 Introduction and classification. 1.2 Pyrrole. 1.2.1 Methods of synthesis : i) From acetylene. ii) From furan. iii) From succinamide	To study the classification of Heterocyclic compounds. To study methods of preparation and chemical reactions of Pyrrole, Pyridine, and Quinoline	**Students gain the** Classification of He Methods of prepara Pyrrole, Pyridine,
1.2.2 Physical properties. 1.2.3 Reactivity of pyrrole : i) Basic character. ii) Acidic character. iii) Electrophilic substitution with general mechanism. 1.2.4 Chemical reactions: i) Reduction. ii) Oxidation. iii) Nitration, sulphonation and halogenation. iv) Friedel Craft's reaction. v) Coupling reaction. 1.3 Pyridine. 1.3.1 Methods of synthesis. i) From acetylene and hydrogen cyanide. ii) From piperidine. 1.3.2 Physical properties. 1.3.3 Chemical reactions i) Basic character ii) Electrophilic substitution(nitration,		

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sulphonationbdbromination) reactions iii) Nucleophilic substitution - General mechanism. Reactions with sodamide, sodium hydroxide and n-Butyl lithium. 1.4 Quinoline 1.4.1 Synthesis - Skraup's synthesis 1.4.2 Physical properties. 1.4.3 Reactions of quinoline : i) Electrophilic substitution reactions - Nitration and sulphonation. ii) Nucleophilic substitution reactions - Reactions with sodamide, alkylation and arylation. iii) Reduction		
2. Carbohydrates 2.1 Introduction. 2.2 Classification and nomenclature. 2.3 Monosaccharide D-glucose - Open chain structure. 2.4 Chain lengthening of Aldoses - Kiliani synthesis. 2.5 Chain shortening of Aldoses - Weerman's reaction. 2.6 Interconversion of glucose and fructose. 2.7 Configuration of D-glucose from D-arabinose	**To study the** 2.2 Classification and nomenclature. 2.3 Monosaccharide D-glucose - Open chain structure. 2.4 Chain lengthening of Aldoses - Kiliani synthesis. 2.5 Chain shortening of Aldoses - Weerman's reaction. 2.6 Interconversion of glucose and fructose. 2.7 Configuration of D-glucose from D-arabinose	**Students gain the** Classification and Configuration ofMonosa Objections against glucose. Ring structure of D size of ring by, Methylation method. Periodic acid treatm Disaccharides - Int - Sources, structur formulae and uses Polysaccharides - structural formula
2.8 Objections against open chain structure of D-glucose. 2.9 Muta-rotation with mechanism. 2.10 Ring structure of D-glucose - Determination of size of ring by, i) Methylation method, ii) Periodic acid treatment method. iv) X - ray analysis. 2.11 Disaccharides - Introduction, sucrose and	2.8 Objections against open chain structure of D-glucose. 2.9 Muta-rotation with mechanism. 2.10 Ring structure of D-glucose - Determination of size of ring by, i) Methylation method. ii) Periodic acid treatment method. iv) X - ray analysis. 2.11 Disaccharides -	

lactone - Sources, structural formulae and uses. 2.12 Polysaccharides – Introduction starch. - Sources, structural formulae and uses	Introduction, sucrose and lactose - Sources, structural formulae and uses. 2.12 Polysaccharides – Introduction starch. - Sources, structural formulae and uses	
3. Vitamins and Hormones 3.1 General idea of vitamins, structure and synthesis of vitamin A 3.2 General idea of hormones, structure and synthesis of Adrenaline and Thyroxin	To study the General idea of vitamins, structure and synthesis of vitamin A General idea of hormones, structure and synthesis of Adrenaline and Thyroxin	**Students gain the** General idea of vitamins, of vitamin A General idea of ho of Adrenaline and
4. Pharmaceuticals 4.1 Introduction. 4.2 Qualities of ideal drug. 4.3 Methods of classification of drugs - Classification based on the therapeutical action. 4.4 Brief idea of penicillin-O (constitution, synthesis not expected) 4.5 Synthesis and uses of the following drugs : i) Antimalerials - Paludrin. ii) Antituberculars - Isoniazide and Ethambutol. iii) C. N. S. drugs - Phenobarbitone. iv) Antidiabetics - Tolbutamide. v) Antiinflammatory drugs - Ibuprofen. vi) Antibiotic - Chloromycetin	To study the Qualities of ideal drug. Methods of classification of drugs - Classification based on the therapeutical action. Synthesis and uses of the following drugs : i) Antimalerials - Paludrin. ii) Antituberculars - Isoniazide and Ethambutol. iii) C. N. S. drugs - Phenobarbitone. iv) Antidiabetics - Tolbutamide. v) Antiinflammatory drugs - Ibuprofen. vi) Antibiotic - Chloromycetin	**Students gain the** Qualities of ideal Methods of classific based on the thera Synthesis and uses i) Antimalerials - ii) Antituberculars iii) C. N. S. drugs iv) Antidiabetics - v) Antiinflammator vi) Antibiotic - Chloromy
5 Synthetic dyes. 5.1 Introduction, Qualities of good dye. 5.2. Classification based on constitution and methods of applications. 5.3 Witt's theory - Colour and constitution. 5.4 Synthesis of Orange IV, Malechite green, phenolphthalein	**To study the:** Qualities of good dye. Classification based on constitution and methods of applications. Witt's theory - Colour and constitution. Synthesis of Orange IV, Malechite green, phenolphthalein	**Students gain the** Qualities of good Classification base of applications. Witt's theory - Colour Synthesis of Oran phenolphthalein
6 Agrochemicals. 6.1 General	**To study the:**	**Students gain the**

idea of agrochemicals including pyrethroides. 6.2 Synthesis and uses of the following agrochemicals : i) Indole-3-acetic acid. ii) Monocrotophos. iii) Methoxychlor. iv) Ethaphan. v) Carbaryl.	General idea of agrochemicals including pyrethroides. Synthesis and uses of the following agrochemicals : i) Indole-3-acetic acid. ii) Monocrotophos. iii) Methoxychlor. iv) Ethaphan. v) Carbaryl.	General idea of ag pyrethroides. Synthesis and uses agrochemicals : i) Indole-3-acetic ii) Monocrotophos. iii) Methoxychlor. iv) Ethaphan. v) Carbaryl of IMS

B.Sc. III		
NAME OF SUBJECT: Analytical and Industrial Organic Chemistry		
SEM VI		
COURSE NUMBER (PAPER NUMBER) PXVI		
TITLE OF COURSE (NAME OF PAPER): Analytical and Industrial Organic Chemistry		
COURSE CONTENT	**OBJECTIVES**	**OUTCOME**
1. Soaps and Detergents. [08] 1.1 Soap i) Raw materials. ii) Types of soaps. iii) Manufacture of soap - Hot process. iv) Cleansing action of soaps. 1.2 Detergents i) Raw materials. ii) Types of detergents - Cationic, anionic, amphoteric, neutral deterents. iii) Preparation of teepol and deriphat. 1.3 Comparison between soaps and detergents	**To study the:** Soap Raw materials. Types of soaps. Manufacture of soap - Hot process. Cleansing action of soaps. Detergents Raw materials. Types of detergents - Cationic, anionic, amphoteric, neutral deterents. Preparation of teepol and deriphat. Comparison between soaps and detergents	**Students gain the understanding of:** Soap and detergents, their raw materials, manufacturing processes, cleansing action of soap and types of detergents
2. Synthetic polymers. [08] 2.1 Introduction. 2.2 Classification : i) According to origin, composition method of preparation and general physical properties. ii) Classification based upon structure=2.3 Process of addition polymerization - free radical polymerization of alkenes and Dienes. 2.4 Ionic polymerization. 2.5 Ziegler - Natta polymerization. 2.6	**To study the:** Classification of polymer. Process of addition polymerization - free radical polymerization of alkenes and Dienes. Methods of preparation and uses of : i) Polythene. ii) Polystyrene iii) PVC. iv) Phenol formaldehyde resin. v) Urea formaldehyde resin vi) Poly urethane 2.7 Natural rubber : General	**Students gain the understanding of: -** Polymerisation processes. Methods of preparation and uses of i) Polythene. ii) Polystyrene iii) PVC. iv) Phenol formaldehyde resin. v) Urea formaldehyde resin. vi) Poly urethane 2.7 Natural rubber : General idea and vulcanization. 2.8 Synthetic

Methods of preparation and uses of : i) Polythene. ii) Polystyrene iii) PVC. iv) Phenol formaldehyde resin. v) Urea formaldehyde resin vi) Poly urethane 2.7 Natural rubber : General idea and vulcanisation. 2.8 Synthetic rubbers : Synthesis and uses of - i) Polychloropeene, ii) Buna rubber - Buna N and Buna S.	idea and vulcanisation. 2.8 Synthetic rubbers : Synthesis and uses of - i) Polychloroprene. ii) Buna rubber - Buna N and Buna S.	rubbers : Synthesis and uses of - i) Polychloroprene, ii) Buna rubber - Buna N and Buna S
3. Sugar and Alcohol Industry [09] 3.1 Manufacture of raw cane sugar. 3.2 Refining of raw sugar. 3.3 White sugar. 3.4 By-products of sugar industry. 3.4.1 Manufacture of ethyl alcohol from molasses 3.4.2 Rectified spirit, Denatured spirit absolute alcohol and power alcohol. 3.4.3 By-products of alcohol industry	**To study the:** Manufacture of raw cane sugar. Refining of raw sugar. White sugar. By-products of sugar industry. Manufacture of ethyl alcohol from molasses Rectified spirit. Denatured spirit absolute alcohol and power alcohol. By-products of alcohol industry.	**Students gain the understanding of:** Manufacture of raw cane sugar. Refining of raw sugar. White sugar. By-products of sugar industry. Manufacture of ethyl alcohol from molasses Rectified spirit. Denatured spirit absolute alcohol and power alcohol. By-products of alcohol industry.
4. Textile chemistry 4.1 Introduction, classification of fibers. 4.2 Sizing: object of sizing, sizing ingredients and their functions. 4.3 General idea of processes like singeing, desizing, scouring. 4.4 Bleaching: i) Brief study of the outline of the process of bleaching cotton and synthetic material. 4.5 Dyeing : Study of dyeing of cellulosic material and synthetic fibers with dyes like direct, vat, reactive and disperse dyes	**To study the:** Classification of fibers. Sizing: object of sizing, sizing ingredients and their functions. General idea of processes like singeing, desizing, scouring, Bleaching, Dyeing	**Students gain the understanding of:** Classification of fibers. Sizing: object of sizing, sizing ingredients and their functions. General idea of processes like singeing, desizing, scouring, Bleaching, Dyeing
5. Green Chemistry. 5.1 Introduction - Twelve	**To study the:** Twelve principles of green	**Students gain the understanding of:** Twelve

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principles of green chemistry. 5.2 Zeolites - Friedel Craft's alkylation and acylation, oxidation of benzene to phenol and benzoquinone. Reduction of benzoquinone to hydroquinone. 5.3 Biocatalytic reaction - Hydroxylation and oxidation using enzymes. 5.4 Introduction to microwave assisted reactions	chemistry. Zeolites - Friedel Craft's alkylation and acylation. oxidation of benzene to phenol and benzoquinone. Reduction of benzoquinone to hydroquinone. Biocatalytic reaction - Hydroxylation and oxidation using enzymes. Introduction to microwave assisted reactions	principles of green chemistry. Zeolites - Friedel Craft's alkylation and acylation. oxidation of benzene to phenol and benzoquinone. Reduction of benzoquinone to hydroquinone. Biocatalytic reaction - Hydroxylation and oxidation using enzymes. Introduction to microwave assisted reactions
6. Chromatography 6.1 Introduction. 6.2 General principles. 6.3 Classification. 6.4 Study of following chromatographic techniques with reference to principle, methodology and applications. i) Paper chromatography. ii) Column chromatography. iii) Thin layer chromatography. iv) Gas chromatography	**To study the:** General principles. Classification. Study of following chromatographic techniques with reference to principle, methodology and applications. i) Paper chromatography. ii) Column chromatography. iii) Thin layer chromatography. iv) Gas chromatography	**Students gain the understanding of:** General principles. Classification. Study of following chromatographic techniques with reference to principle, methodology and applications. i) Paper chromatography. ii) Column chromatography. iii) Thin layer chromatography. iv) Gas chromatography

Head of the Department

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Hemaji Chandola Co... (Au...)
Tel: ...

Program ...
Name of Depart...

1. Demonstrate a rigorous understanding of the ... and principles of physics which include mechanics, electromagnetism, ... classical quantum mechanics, electronics and nuclear physics.
2. Students will demonstrate understanding of ... mathematical techniques and apply critical reasoning skills to solve phy... problems.
3. Demonstrate proficiency in formulating ... and interpretation of data.
4. Communicate scientific information in ... graphical formats.

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Physics

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Hemaji Chandola College

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Hemuji Chandele College, Shelgaon R

Program Outcome

Name of Department: Physics

- Demonstrate a rigorous understanding of the core theories and principles of physics, which include
- mechanics, electromagnetism, thermodynamics, quantum mechanics, electronics and nuclear
- physics.
- Students will demonstrate understanding of the applications of numerical techniques and apply
- critical reasoning skills to solve physics related problems.
- Demonstrate proficiency in the measurement, analysis and interpretation of data.
- Communicate scientific information in oral, written, and graphical formats

B.A. / B.Sc. / M.A. / M.Sc.: B.Sc
NAME OF SUBJECT: Physics
SEM I / II / III / IV / V / VI : Sem I
COURSE NUMBER I PAPER NUMBER: Paper I

COURSE CONTENT	OBJECTIVE	OUTCOME
Moment of inertia Review of M.I., Moment of Inertia of 1) Circular disc 2) Rectangular lamina 3) Spherical Shell 4) Fly wheel	To understand the concept of Moment of Inertia and to calculate moment of Inertia of various rigid bodies	Student understood the important concepts of Moment of Inertia. The students are able to calculate moment of inertia of various rigid bodies.
Pendulums Introduction. Theory of compound pendulum, Bar pendulum, Kater's Pendulum, Bassel's Theory, Bifilar pendulum (parallel suspensions of equal lengths), Torsional Pendulum.	To understand theory of compound pendulum. To study various pendulums like Bar pendulum, Kater's Pendulum, Bifilar pendulum, Torsional Pendulum.	Students understood the working theory of compound pendulum. Students are successfully able to understand theory of various pendulums like Bar pendulum, Kater's Pendulum, Bifilar pendulum, Torsional Pendulum.

Elasticity Introduction, Equivalence of shear strain to compression and extension strains, Relation between elastic constants, Poisson's ratio of rubber tube (Theory and experimental method)	To understand the concept of elasticity. To study elastic constant and relation between them. To study the Poisson's ratio of rubber tube.	Students understand the concept of elasticity. Students understand the relation between elastic constants. Students also studied the theory and experimental method to study Poisson's ratio.
Surface Tension Review of S.T., relation between excess pressure and surface tension, excess pressure inside a liquid drop and soap bubble, Jaeger's method to determine Surface Tension, Factors affecting Surface Tension, Applications of Surface Tension.	To understand the concept of surface tension. To understand relation between excess pressure and surface tension, excess pressure inside a liquid drop and soap bubble. To study the factors affecting Surface Tension and Applications of Surface Tension.	Students understood the concept of surface tension. Students understood the relation between excess pressure and surface tension, excess pressure inside a liquid drop and soap bubble. Students understood the factors affecting Surface Tension and Applications of

		Surface Tension
Viscosity and fluid dynamics : Introduction, Newton's law of viscosity, streamline and turbulent flow, Critical velocity and Reynolds number, Equation of continuity, Energy possessed by liquid, Poiseuille's equation, Bernoulli's theorem and its applications to 1) Venturimeter 2) Automiser. Factors Affecting on viscosity.	To understand the concept of Viscosity and fluid dynamics. To understand Energy possessed by liquid. Poiseuille's equation. Bernoulli's theorem and its application.	Students understood concept of viscosity and fluid dynamics. To understand Energy possessed by liquid. Poiseuille's equation. Bernoulli's theorem and its application.

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Hemuji Chandele College, Shelgaon R

COURSE OUTCOME

Name of Department: Physics

		Surface Tension
Viscosity and Fluid dynamics Introduction, Newton's law of viscosity, streamline and turbulent flow, Critical velocity and Reynolds number, Equation of continuity Energy possessed by liquid, Poiseuille's equation, Bernoulli's theorem and its applications to 1) Venturimeter 2) Automiser, Factors Affecting on viscosity.	To understand the concept of Viscosity and Fluid dynamics To understand Energy possessed by liquid, Poiseuille's equation, Bernoulli's theorem and its applications	Students understood concept of Viscosity and Fluid dynamics To understand Energy possessed by liquid poiseuille's equation, Bernoulli's theorem and its applications

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COURSE OUTCOME

Name of Department: Physics

B.A. / B.Sc. / M.A. / M.Sc. B.Sc.

NAME OF SUBJECT: Physics

SEM I / II / III / IV / V / VI Sem-I

COURSE NUMBER (PAPER NUMBER) Paper II

TITLE OF COURSE (NAME OF PAPER) Optics and Laser

COURSE CONTENT	OBJECTIVES	OUTCOME
Geometrical Optics and aberrations Introduction, Fermat's principle, Deduction of laws of reflection and refraction by Fermat's principle, Chromatic and Spherical aberration, methods to minimize Chromatic and Spherical aberrations.	To understand Fermat's Principle, its application, Aberration and its types.	The students understand Fermat's principle and Aberration.
Optical Instruments Introduction, Types of eye-pieces, Gauss eye piece, Ramsden's eye-piece, Huygen's eye-piece, Construction, working and Application of Spectrometer and Optical	To get knowledge of types, construction and working of eye pieces, spectrometer and optical bench.	The students get knowledge of types, construction and working of eye pieces, spectrometer and optical bench.

bench.		
Interference Introduction, interference in parallel faced thin film (Reflected light only), wedge shaped film, Newton's rings and its applications.	To get knowledge of interference phenomenon in parallel faced, wedge shaped thin film and Newton's rings experiment.	The students get knowledge of interference phenomenon in parallel faced, wedge shaped thin film and Newton's rings experiment.
Diffraction Introduction, Types of diffraction, Plane diffraction grating and its elementary theory, its application to determine wavelength, Comparison between prism and grating spectra	To get knowledge of Types of diffraction, plane diffraction and its elementary theory, its applications.	The students get knowledge of Types of diffraction, Plane diffraction and its elementary theory, its applications.

Laser introduction, Spontaneous and Stimulated emission and absorption, Einstein's Coefficients, Population inversion, Optical Pumping, Cavity resonator, He-Ne and Ruby Laser, Properties and application.	To get knowledge of Laser basics, construction and working of He-Ne and Ruby Laser.	The students get knowledge of Laser basics, construction and working of He-Ne and Ruby Laser.

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COURSE OUTCOME

Name of Department: Physics

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.

NAME OF SUBJECT: Physics

SEM I / II / III / IV / V / VI: Sem-II

COURSE NUMBER (PAPER NUMBER) : V

TITLE OF COURSE (NAME OF PAPER): General Physics, Heat and Sound

COURSE CONTENT	OBJECTIVE	OUTCOME
Vectors 1.1 Scalar and vector triple product 1.2 Scalar and vector fields 1.3 Del operator 1.4 Gradient of a scalar 1.5 Divergence of a vector, curl of vector and their physical significance	To get knowledge of Scalar and vector triple product, Scalar and vector fields, Del operator, Gradient of a scalar, Divergence of a vector, curl of vector and their physical significance	The students get knowledge of Scalar and vector triple product, Scalar and vector fields, Del operator, Gradient of a scalar, Divergence of a vector, curl of vector and their physical significance
Precessional Motion 2.1 Precession 2.2 Nutation 2.3 Gyroscope 2.4 Lanchester's rules 2.5 Gyrostatic pendulum 2.6 Motion of rolling disc 2.7 Gyroscopic applications in brief	To understand Precession, Nutation, Lanchester's rules, Gyroscope and its application.	The students understand understand Precession, Nutation, Lanchester's rules, Gyroscope and its applications
Elasticity 3.1 Bending of a beam 3.2 Bending moment 3.3 Cantilever 3.4 Centrally loaded beam	To get knowledge of elasticity, Bending moment, Cantilever and expression for Y and n of Flat spiral spring	The students get knowledge of elasticity, Bending moment, Cantilever and expression for Y and η of Flat spiral spring.

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3.5 Flat spiral spring expression for Y and n		
Viscosity 4.1 Viscosity of liquid by rotating cylinder method 4.2 Searle's viscometer 4.3 Ostwald's viscometer	To get knowledge of Viscosity, Searle's viscometer and Ostwald's viscometer.	The students get knowledge of Viscosity, Searle's viscometer and Ostwald's viscometer.
Heat 5.1 Entropy 5.2 Change in entropy 5.3 Physical concept and physical significance of entropy 5.4 T – S diagram 5.5 Entropy of a perfect gas 5.6 Entropy of a steam	To study Entropy, physical significance of entropy, T-S diagram and Entropy of a perfect gas &steam.	The students understand Entropy, physical significance of entropy, T-S diagram and Entropy of a perfect gas & steam.
Sound 6.1 Transducer 6.2 Pressure microphone 6.3 Moving coil Loudspeaker 6.4 Acoustics and its affecting	To get knowledge of Transducer, Acoustics and its affecting factors, Reverberation time, Requirements of good acoustics, Sabine's formula and production, Detection	The students get knowledge of Transducer, Acoustics and its affecting factors, Reverberation time,

factors 6.5 Reverberation time 6.6 Optimum reverberation time 6.7 Requirements of good acoustics 6.8 Sabine's formula 6.9 Ultrasonic production by piezoelectric method 6.10 Detection of ultrasonic 6.11 Properties and applications of ultrasonic	Properties and applications of ultrasonic	Requirements of good acoustics, Sabine's formula and production, Detection, Properties and applications of ultrasonic

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Head of the Department
Physics

Hemuji Chandele College, Shelgaon R

COURSE OUTCOME

Name of Department: Physics

B.A. / B.Sc. / M.A. / M.Sc.

NAME OF SUBJECT: Physics

SEM I / II / III / IV / V / VI

COURSE NUMBER (PAPER NUMBER) VI

TITLE OF COURSE (NAME OF PAPER) ELECTRONICS

COURSE CONTENT	OBJECTIVES	OUTCOME
Transistor amplifier : 1.1 Transistor biasing: voltage divider bias 1.2 Two stage R-C coupled transistor amplifier 1.3 Frequency response curve of an amplifier 1.4 Feedback 1.5 Effect of negative feedback on the frequency response curve 1.6 Differential amplifier 1.7 Modes of operation 1.8 Common mode and differential mode signals 1.9 Comparison	To understand biasing and its need in its amplifiers Modifications in amplifiers with feedback. Differential amplifier	The students understand amplifier and modifications in amplifiers

between vertical amplifier and differential amplifier		
Oscillator 2.1 Types of waveforms 2.2 Oscillations from tank circuit 2.3 Barkhausen's criterion for sustained oscillations 2.4 Concept of AF and RF Oscillator 2.5 Phase shift oscillator 2.6 Colpitt's oscillator 2.7 Hartley oscillator. 2.8 Crystal Oscillator (qualitative treatment only)	To understand oscillators theory of oscillations and different types of oscillators.	The students understand oscillators and different types of oscillators
Unipolar Devices: 3.1 FET: Construction, operation and characteristics 3.2 Application of FET as VVR 3.3 UJT	To study unipolar devices -FET and UJT with its construction and operation and application	The students understand FET and UJT with its construction and operation and application

construction, operation and characteristics 3.4 UJT as voltage sweep generator		
Digital Electronics : 4.1 De Morgan's theorems 4.2 Half adder 4.3 Full adder 4.4 Construction and working of RS flip flop 4.5 Construction and working of JK flip flop	To study digital electronics with different gates with related adders and flip flops.	The students understand digital electronics with different gates with related adders and flip flops.
Regulated power supply 5.1 Regulated power supply (with block diagram) and its need 5.2 Line and load regulation 5.3 Transistor Series power supply 5.4 IC voltage regulators 5.5 Fixed output voltage regulators (using IC 78XX and 79XX) 5.6 Dual power supply	To study different regulated power supply with IC voltage regulators	The students studied different regulated power supply with IC voltage regulators

unit 5		
Electronic instruments 6.1 Principle, Construction and Working of CRT 6.2 Block diagram of CRO 6.3 Uses of CRO 6.4 Block diagram of digital multimeter (DMM) and its applications	To study Electronic Instruments-CRO and DMM	The students studied CRO and DMM

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Hemuji Chandele College, Shelgaon B

COURSE OUTCOME

Name of Department: Physics

B.A / B.Sc / M.A / M.Sc : B.Sc

NAME OF SUBJECT : Physics

SEM I / II / III / IV / V / VI : IV

COURSE NUMBER (PAPER NUMBER) VII

TITLE OF COURSE (NAME OF PAPER) OPTICS

COURSE CONTENT	OBJECTIVES	OUTCOME
Cardinal points: 1.1 Lagrange's equation 1.2 Cardinal points of optical system 1.3 Graphical construction of image using cardinal points 1.4 Newton's formula 1.5 Relation between focal lengths for any optical system 1.6 Relation between lateral, axial and angular magnifications 1.7 Thick lens (introduction)	To study Cardinal points, Newton's formula, Relation between focal lengths for any optical system, Relation between lateral, axial and angular magnifications, Thick lens (introduction) combination of	Students studied Cardinal points, Newton's formula, Relation between focal lengths for any optical system, Relation between lateral, axial and angular magnifications, Thick lens (introduction) combination of two thin lenses

1.2 collimation of two thin lenses	two thin lenses	
Interference of light: 2.1 Michelson's interferometer 2.2 Applications of Michelson's interferometer to measure i) wavelength of light ii) Difference in wavelengths and iii) Refractive index of thin film 2.3 Construction and working of Michelson's interferometer 2.4 Superiority of F.P. interferometer over Michelson's interferometer	To study Michelson's interferometer and Michelson's interferometer	Students studied Michelson's interferometer and Michelson's interferometer
Diffraction of light: 3.1 Fresnel's half period zones 3.2 Explanation of rectilinear propagation of light 3.3 Zone plate 3.4 Fresnel's diffraction at straight edge	To study Fresnel's half period zones. Explanation of rectilinear propagation of light, Zone plate., Fresnel's diffraction at straight edge	Students studied Fresnel's half period zones. Explanation of rectilinear propagation of light, Zone plate., Fresnel's diffraction at straight edge

Resolving power: 4.1 Geometrical and spectral resolution 4.2 Distinction between magnification and resolution 4.3 Rayleigh's criterion for the limit of resolution 4.4 Modified Rayleigh's criterion 4.5 R.P. of plane diffraction grating 4.6 R.P. of prism	To study Resolving power, Geometrical and spectral resolution, Distinction between magnification and resolution, Rayleigh's criterion for the limit of resolution, Modified Rayleigh's criterion, R.P. of plane diffraction grating, R.P. of prism	Students studied Resolving power, Geometrical and spectral resolution, Distinction between magnification and resolution, Rayleigh's criterion for the limit of resolution, Modified Rayleigh's criterion, R.P. of plane diffraction grating, R.P. of prism
Polarization: 5.1 Double refraction 5.2 Huygen's explanation of double refraction through uni-axial crystals 5.3 Nicols prism 5.4 Phase retardation plates 5.5 Elliptically and circularly polanzed light 5.6 Optical rotation 5.7 Laws of rotation of plane of polarization 5.8 Applications a) Polarimeter b) Liquid crystal Displays	To study Polarization, Double refraction Huygen's explanation of double refraction through uni-axial crystals, Nicols prism, Phase retardation plates, Elliptically and circularly polarized light, Optical rotation,	Students studied Polarization, Double refraction Huygen's explanation of double refraction through uni-axial crystals, Nicols prism, Phase retardation plates, Elliptically and circularly polarized light, Optical rotation, Laws of rotation of

	Laws of reflection of plane of polarization. Applications	plane of polarization. Applications
Optical Fibers 6.1 Structure and types of fibers 6.2 Numerical aperture (definition only) 6.3 Pulse dispersion in step index fiber 6.4 Fiber optic communication system (Qualitative treatment only) 6.5 Advantages of optical fibre	To study structure and types of fibers. Numerical aperture (definition only). Pulse dispersion in step index fiber. fiber optic communication system. Advantages of optical fibre	Students studied structure and types of fibers. Numerical aperture (definition only). Pulse dispersion in step index fiber. fiber optic communication system. Advantages of optical fiber

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Physics

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COURSE OUTCOME

Name of Department: Physics

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.

NAME OF SUBJECT : Physics

SEM I / II / III / IV / V / VI : IV

COURSE NUMBER (PAPER NUMBER) VII

TITLE OF COURSE (NAME OF PAPER) : modern physics

Course contents	objectives	outcomes
1. Theory of relativity. [9 hr] 1.1 inertial frame of reference 1.2 Galilean transformation 1.3 Invariance of laws of mechanics under Galilean transformation 1.4 Ether hypothesis 1.5 Michelson-Morley experiment 1.6 Einstein's postulates of the special theory of relativity 1.7 Lorentz transformation	To study . Theory of relativity Inertial frame of reference. Invariance of laws of mechanics under Galilean transformation and Variation of time with velocity	Students studied inertial frame of reference, galean transformation also ether hypothesis lorentz transformation variation of time with velocity, velocity addition theorem

1.8 Variation of length with velocity 1.9 Variation of time with velocity 1.10 velocity addition theorem 1.11 Variation of mass with velocity 1.12 Mass energy relation 1.13 Twin paradox		
2. Matter waves: [6 hr] 2.1 De Broglie's hypothesis of matter waves 2.2 De Broglie's wavelength 2.3 Particle velocity, group velocity, phase velocity & their interrelationship 2.4 Properties of matter waves 2.5 Bohr's quantum condition on the basis of matter wave hypothesis 2.6 Heisenberg's uncertainty principle and its illustrations	To study De Broglie's hypothesis of matter waves, Particle velocity, group velocity, phase velocity & their interrelationship and Heisenberg's uncertainty principle	Students studied the concept of De Broglie's hypothesis of matter waves, Particle velocity, group velocity, phase velocity & their interrelationship and Heisenberg's uncertainty principle
3. Vector Atom model: [8 hr] 3.1 Space quantization 3.2 Spin hypothesis 3.3 Stern-Gerlache experiment 3.4 Quantum numbers associated with vector atom model 3.5 Pauli's exclusion principle 3.6 Spin orbit coupling	To study Space quantization Spin hypothesis Stern-Gerlache experiment Quantum numbers associated with vector atom model Pauli's exclusion principle	Students studied the concept of Space quantization Spin hypothesis Stern-Gerlache experiment Quantum numbers associated with vector atom model Pauli's exclusion principle Spin orbit coupling

3.7 Hund's rule 3.8 Total angular momentum 3.9 L-S coupling 3.10 j-j coupling 3.11 Zeeman effect 3.12 Normal and anomalous Zeeman effect 3.13 Debye's explanation of Normal Zeeman effect	Spin orbit coupling Hund's rule	Hund's rule
4. Compton effect: [3 hr] 4.1 Compton Effect 4.2 Expression for change in wavelength for scattered photon 4.3 Experimental verification of Compton effect	To study Compton effect and expression for change in wavelength for scattered photon Experimental verification of Compton effect	Students studied the concept of Compton effect and expression for change in wavelength for scattered photon Experimental verification of Compton effect
5. Nuclear Energy sources: [4 hr] 5.1 Neutron induced nuclear reaction 5.2 Nuclear fission 5.3 Energy released in fission 5.4 Chain reaction (Atomic Bomb) 5.5 Nuclear reactor 5.6 Atomic energy in India	To study nuclear energy sources neutron in Neutron induced nuclear reaction Nuclear fusion Energy released in fission Chain reaction	Students studied nuclear energy sources, neutron induced nuclear reactions and nuclear fission and chain reaction

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Head of the Department
Physics

DEPARTMENT OF MICROBIOLOGY

Program Outcome [B.Sc. I – Microbiology]

- Historical development of microbiology
- Scope of microbiology
- Beneficial and harmful effects of microorganisms
- Diversity in types of microorganisms
- General characters of different microorganism
- Principles of microscopy and use of it to observe and study microbes
- Different staining techniques, Sterilization Techniques, Cultivation techniques of microorganisms, Methods of Pure culture, Maintenance and preservation of pure cultures
- Basic Biochemistry, Microbial Metabolism, Microbial Nutrition and Growth
- Applied branches of microbiology such as water microbiology, sewage microbiology, milk microbiology, medical microbiology

Program Outcome [B.Sc. II – Microbiology]

- Ultra structure and Functions different organelle of bacterial cell
- Bacterial Growth, Effect of Environmental factors on Bacterial growth, Metabolism
- Virology
- Structure of nucleic acids & Replication of Bacterial DNA
- Gene, Genetic code and Transcription, Plasmids
- Bacterial Mutation
- Immunity
- Antigen and Antibody
- Clinical Microbiology
- Pathogenecity, Microbial Diseases
- scope of Industrial microbiology, Fermentation Media, Screening, Inoculum Development and Scale Up, Microbiological assays, Specific fermentations

Program Outcome [B.Sc. III – Microbiology]

- Classification of Viruses, Reproduction of bacterial and animal viruses, Plant Viruses, Techniques in Virology
- Soil microorganisms, types and their role in elemental cycle
- Composting and Biodegradation, Plant diseases Applications of Biotechnology in Agriculture
- Adaptive Immunity, Monoclonal antibodies, Major Histocompatibility complex, Complement system, Immunological disorders
- ABO blood group system, Rh blood group system, Blood transfusion reaction and its complications
- Food Microbiology, Dairy Microbiology, Industrial production of Streptomycin,Lysin, rDNA products, Production of alcoholic beverages, Downstream processing and quality control
- Basic concepts of microbial genetics, Effect of mutation in bacteria, Genetic engineering and Protein engineering, Techniques in molecular biology, Bioinformatics
- Enzyme, Enzyme kinetics and regulation, Extraction, purification and assay of enzymes
- Bioenergetics, Biosynthesis of Nucleotides , Protein ,Peptidoglycan
- Air microbiology, Marine microbiology and Fresh water ecosystem, Extremophiles, Geomicrobiology.
- Environmental impact assessment and Industrial Waste Management
- Clinical Bacteriology, Mycology, Parasitology, Virology , Chemotherapy

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Shelgaon(R) Tal-Barshi

Tuljabhavani Mahila Mandal's

Hemuji Chandele College, Shelgaon (R).

Tal. Barshi, Dist. Solapur (Maharashtra) 413222

COURSE OUTCOME

Name of Department: - Microbiology

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem I		
COURSE NUMBER (PAPER NUMBER) : PAPER -I		
TITLE OF COURSE (NAME OF PAPER) :- Introduction to Microbiology and Microbial diversity		
COURSE CONTENT	**OBJECTIVES**	**OUTCOME**
UNIT-I: History of Development of Microbiology	TO know the historical events occur for the development of advance Microbiology. To know the various contributions in development of Microbiology by the scientists	Students will come to know or familiar the history of microbiology and various contributions by the scientists
UNIT –II: Diversity of microbial world	To know the microbial diversity and identify through morphological , cultural characterization and biochemical characterization	Students will be able to identify microorganisms through morphological, cultural and biochemical characterization.
UNIT III: General characters of different groups of microorganisms -Cellular & acellular	To study general characters of various groups of microorganisms cellular as well as acellular	Students will come to know to general characters of various groups of microorganisms cellular as well as acellular
UNIT – IV: An overview of Scope of Microbiology	To know the various branches of Microbiology. To know the beneficial and harmful roles of various microorganisms	Students will be able to know various branches of Microbiology and beneficial and harmful roles of microorganisms Signature

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COURSE OUTCOME

Name of Department ____Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc		
NAME OF SUBJECT : Microbiology		
SEM : I / II / III / IV / V / VI : Sem I		
COURSE NUMBER (PAPER NUMBER) : II		
TITLE OF COURSE (NAME OF PAPER) Microbial techiques		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1:Microscopy	To understand the principle and applications of Microscope	Students will use microscope efficiently
Unit 2: Staining techniques	To aware of various types of stains. To provide an intensive and in depth teaching about various staining methods	Students will apply the theoritical knowledgeto perform different staining methods to stain bacteria & study different organelle of bacteria
Unit 3:sterilization techniques	To study various terms related to sterilization techniques	students will • be acquainted with various sterilization techniques • Use various methods to control microbes.
Unit 4:Cultivation techniques of microorganisms	To train the students to prepare culture media & cultivate various types of microorganisms To know the preservation techniques for maintenance of	Students will be able to cultivate various microorganisms & also will be able to maintain pure cultures of microorganisms

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Tal. Barshi, Dist. Solapur (Maharashtra) 413221

COURSE OUTCOME

Name of Department ____Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B Sc		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem I		
COURSE NUMBER (PAPER NUMBER) : II		
TITLE OF COURSE (NAME OF PAPER) Microbial techniques		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1:Microscopy	To understand the Principle and applications of Microscope	Students will use microscope efficiently
Unit 2: Staining techniques	To aware of various types of stains. To provide an intensive and in depth training about various staining methods.	Students will apply the theoretical knowledgeto perform different staining methods to stain bacteria & study different organelle of bacteria
Unit 3:sterilization techniques	To study various terms related to sterilization techniques	students will : • be acquainted with various sterilization techniques • Use various methods to control microbes.
Unit 4:Cultivation techniques of microorganisms	To train the students to prepare culture media & cultivate various types of microorganisms To know the preservation techniques for maintenance of pure culture	Students will be able to cultivate various microorganisms & also will be able to maintain pure cultures of microorganisms

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COURSE OUTCOME

Name of Department: Microbiology

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc		
NAME OF SUBJECT : Microbiology		
SEMESTER II		
COURSE NUMBER (PAPER NUMBER) : **PAPER III**		
TITLE OF COURSE (NAME OF PAPER) **(Microbial Biochemistry and Physiology)**		
COURSE CONTENT	OBJECTIVES	OUTCOME
UNIT-I Basic Biochemistry	To understand the structure and applications of various macromolecules like carbohydrates, proteins lipids DNA and RNA	Students will use knowledge in day today life
UNIT-II-Microbial Enzymes	To understand the structure mechanism of action and applications of various enzymes	Students will apply the knowledge in studying living system and role of enzymes
UNIT- III - Microbial Metabolism:-	To study basic concepts of metabolism	The students will know about how organisms use a source for their growth
UNIT- IV - Microbial Nutrition and Growth	To make aware the students to prepare culture media role of nutrient and nutritional classification pure culture	Students will be able to cultivate various microorganisms & also will be able to grow microorganisms using knowledge of nutritional requirements

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Tal. Barshi, Dist. Solapur (Maharashtra) 413222

COURSE OUTCOME

Name of Department ____Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B. Sc		
NAME OF SUBJECT : Microbiology		
SEMESTER:II		
COURSE NUMBER (PAPER NUMBER) : **PAPER IV**		
TITLE OF COURSE (NAME OF PAPER) **(Applied Microbiology)**		
COURSE CONTENT	OBJECTIVES	OUTCOME
UNIT-I - WATER MICROBIOLOGY	To understand the microbial flora of water, causes of water pollution, examination of water and control of pollution	Students will use knowledge in day today life. They can do the microbial examination of water. And water potability
UNIT-II- SEWAGE MICROBIOLOGY	To understand the composition, types, microbial flora, parameters for strength of sewage like B.O.D and C.O.D, significance of sewage treatment.	Students will apply the knowledge in studying role of microorganisms in treatment of sewage & its significance. Dangerous effects of discharge of sewage in natural streams.
UNIT- III - MILK MICROBIOLOGY	To study basic concepts of milk, milk composition, contamination of milk, microbiological examination , preservation of milk , Pasteurization etc.	The students will know about role of organisms in contamination of milk, use of various methods of Pasteurization of milk so as to preserve the milk. They can use knowledge in day to day life.
UNIT- IV - MEDICAL MICROBIOLOGY	To make aware the students about medical terminologies, in general basic information of infection, disease, cause, spread, types, prevention and control	Students will be enriched in knowledge about harmful activities of microorganisms using knowledge and using this they will come to know about pathogens, types of diseases spread control , vaccination

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COURSE OUTCOME

Name of Department ____Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem III		
COURSE NUMBER (PAPER NUMBER) : Paper V		
TITLE OF COURSE (NAME OF PAPER) Cytology and Physiology of Microorganisms		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I : Ultra structure and Functions	To understand the structure of and functions of bacterial cell organelles	Students will know about fundamental structure of organelles of bacteria
Unit II: Bacterial Growth	To understand the growth pattern of bacteria	Students will know the growth of bacteria &apply the theoretical knowledge in various aspects
Unit III: Effect of Environmental factors on Bacterial growth	To study the effects of various environmental factors on bacterial growth	students will apply knowledge in studying effects of various environmental factors on bacterial growth
Unit IV: Metabolism	To understand the metabolism students to prepare culture media & cultivate various types of microorganisms	Students will be able to describe metabolism of glucose ; modes of ATP generation by various Methods
Unit V Virology	To study basic structure of viruses and their cultivation	Students will know about structure of viruses and their cultivation

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COURSE OUTCOME

Name of Department: - Microbiology

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem III		
COURSE NUMBER (PAPER NUMBER) : Paper-VI		
TITLE OF COURSE (NAME OF PAPER) :- : Bacterial Genetics		
COURSE CONTENT	**OBJECTIVES**	**OUTCOME**
UNIT–I: Structure of nucleic acids & Replication of Bacterial DNA	To understand the detail structure of nucleic acids. To learn the concept of bacterial DNA replication	Students will be able to know or familiar the structure of DNA and the concept of bacterial DNA replication
UNIT –II: Gene, Genetic code and Transcription	To study or learn the concept of Gene, Genetic code and Transcription	Students will be able to learn or understand the concept of Gene, Genetic code and Transcription
UNIT III: Bacterial Mutation	To study or learn the concept of bacterial mutation through mutagenesis by different mutagens	To study or learn the concept of bacterial mutation through mutagenesis by different mutagens
UNIT – IV: Plasmids	To understand the basic concept of covalently closed circular DNA To know various functions of plasmids and transformation	Students will be able to know the concept of Plasmids
Unit – V :Bacterial Recombination	To study or learn the concept of bacterial recombination	Students will be able to know the concept of bacterial recombination

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Tal. Barshi, Dist. Solapur (Maharashtra) 413222

COURSE OUTCOME

Name of Department ___Microbiology_____

B.A. / **B.Sc.** / M.A. / M.Sc : **B.Sc.**		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI IV		
COURSE NUMBER (PAPER NUMBER) VII		
TITLE OF COURSE (NAME OF PAPER) Immunology & medical microbiology		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I:Immunity	To understand the concept of immunity & its mechanism To study the structure & function of cells and organs of immune system	students will be aware of immunity &Concept related to cells and organs related to immune system
Unit II:Antigen & antibody	To understand meaning of antigen and antibody also types To study various types of antigen antibody reactions	students will be able to know how to diagnose the microbial diseases by using antigen antibody reactions
Unit III:Clinical microbiology	To understand the concept of clinical microbiology To study the different types of clinical samples ,how to collect clinical samples To understand the methods of diagnosis of microbial diseases	students will be able to collect clinical samples & use them for diagnosis of various microbial diseases by using various methods
Unit IV:pathogenecity	To understand the concept of pathogenecity	students will be aware of Pathogenicity mechanism
Unit V:Microbial diseases	study some bacterial fungal & viral diseases	students will gain Knowledge and Understanding of some bacterial fungal & viral diseases

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COURSE OUTCOME

Name of Department: - Microbiology

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem IV		
COURSE NUMBER (PAPER NUMBER) : Paper VIII		
TITLE OF COURSE (NAME OF PAPER) :- : : Industrial Microbiology – I		
COURSE CONTENT	**OBJECTIVES**	**OUTCOME**
UNIT-I: Industrial Microbiology	To understand the concept of industrial production through the process of fermentation by the involvement of various microorganisms	Students will be able know the concept of industrial microbiology
UNIT –II: Fermentation Media	To learn or know the procedure or sources for the preparation of media are available for the production of various industrial products through fermentation	Students will be able to know the concept of media used for the production of various fermented products
UNIT III: Screening, Inoculum Development and Scale Up	To study or train to the students about screening, Inoculum development and scale up in industrial microbiology	Students will be able to know the concept of Screening, Inoculum Development and scale up
UNIT – IV: Microbiological assays	To study or determine the compound sensitivity towards the microorganisms through microbiological assay	Students will be able to know the concept of Microbiological assay
Unit – V : Specific fermentations	To understand the concepts of specific fermentations for different industrial products	Students will be able to know the concept of specific fermentations.

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COURSE OUTCOME

Name of Department ____Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem V		
COURSE NUMBER (PAPER NUMBER) : DSE – 1- A: Paper MIC IX: Virology		
TITLE OF COURSE (NAME OF PAPER) : Virology		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I: Introduction and Classification of Viruses	To understand the General properties and structure of virus. To aquire knowledge of Viroids and Prions. To understand Viral classification on the basis of LHT system and as per international committee	Students will get knowledge of General properties and structure of virus. And also aquire knowledge of Viroids and Prions.Students will come to know the present status and schemes of classification viruses
Unit II: Reproduction of bacterial viruses	To impart the knowledge of productive cycle of Tphage - Lytic cycle and Temperate phages and lysogeny of ℓ phages	Students will be able to understand the productive cycle of phage reproduction as well as the nonproductive i.e. lysogenic cycle of temperate phages
Unit IV: Plant Viruses	To study Viral plant Diseases - TMV, CaMV Prevention and Control of Plant Viral Disease	students will understand nature of TMV and CaMV and diseases caused by them and prevention and control of plant diseases
Unit V Techniques in Virology	To train the students to Isolation, cultivation,Purification and Enumeration of viruses A. To know One step growth experiment	Students will be able to learn the methods used for cultivation, purification and enumeration of viruses

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Name of Department ____Microbiology_____

COURSE OUTCOME

Name of Department ____Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem V		
COURSE NUMBER (PAPER NUMBER) : X		
TITLE OF COURSE (NAME OF PAPER) Agricultural Microbiology		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I : Introduction to Soil Microbiology	To understand the soil structure, ecosystem and macro in soil and applications of	Students will about the importance of soil in with respect to microgr
Unit II Role of microorganisms in elemental cycle	To aware of various types of elements required by living system and their transformation	Students will apply the theoretical knowledge to study elemental trasformation
Unit III Composting and Biodegradation	To study various composting methods and role of microorganisms in composting	students can apply knowledge of composting in preparation compost to help to society in solving the problem of solid waste management
Unit IV: Plant pathology	To study the harmful activities like plant diseases caused by organisms , their symptoms, control.	Students will be able to identify plant diseases. And help in control of diseases and make aware the farmers about them
Unit V Applications of Biotechnology in Agriculture	To study role of various types of microorganisms in biotechnology and agriculture	Students can apply knowledge to get rid of problems in the society

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COURSE OUTCOME

Name of Department ___Microbiology_____

B.A. / **B.Sc.** / M.A. / M.Sc.: **B.Sc.**		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem V		
COURSE NUMBER (PAPER NUMBER) DSE-3-A paper MIC-XI		
TITLE OF COURSE (NAME OF PAPER) Immunology		
COURSE CONTENT	COURSE CONTENT	COURSE CONTENT
Unit I :Immune response	To inculcate knowledge in human immune response towards micro organisms	Students will gain knowledge in human immune response towards micro organisms
Unit II: Major Histocompatibility complex	To study structure and function of MHC	Students will acquire knowledge about structure and function of MHC
Unit III: Complement system	To study properties of complement and activation pathways and its biological effects	Study will understand concept of complement activation pathway and biological effects
Unit IV: Immunological disorders	To study concept of allery types and its pathogenesis To study autoimmunity	Study will understand concept of allery and its pathogenesis, autoimmunity
UnitV :Immunohaematology	To study ABO and Rh blood groups blood transfusion reaction	Students will gain knowledge of ABO and Rh blood groups and blood transfusion reactions

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COURSE OUTCOME

Name of Department ___Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem V		
COURSE NUMBER (PAPER NUMBER) : SEC – 1 : Paper MIC – XII		
TITLE OF COURSE (NAME OF PAPER) :- Industrial Microbiology – I		
TITLE OF COURSE (NAME OF PAPER) :- Microbial Biochemistry	COURSE CONTENT	COURSE CONTENT
Unit I :-Food Microbiology	To study of various microorganisms in the food substrate and food spoilages, and the concepts of food preservations for long term of food storage and fermented food production	Students will come to know food spoilages, concepts of food preservations for long term of food storage and fermented foods
Unit –II: Dairy Microbiology	To know milk spoilages by microorganisms and production of various fermented dairy products	Students will be able to know microbial action in milk spoilages and production of dairy fermented products
Unit III: Industrial production	To study various industrial products through fermentation process by desired microorganisms.	Students will be able to know to the production of various fermented products.
Unit – IV) Production of alcoholic beverages	To study of production of alcoholic beverages such as wine and beer and post fermentation of spoilages of wine	Students will be able to know production of wine and beer and concept of wine spoilages
Unit-V:-Downstream processing and quality control	To study or learn the concepts of downstream and quality control processes in fermentation industry	Students will be able know or learn the various downstream and quality control processes in fermentation industry

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COURSE OUTCOME

Name of Department: - Microbiology

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem VI		
COURSE NUMBER (PAPER NUMBER) : DSE – 2 – B: Paper MIC - XI		
TITLE OF COURSE (NAME OF PAPER) :- Microbial Biochemistry		
COURSE CONTENT	**OBJECTIVES**	**OUTCOME**
Unit I :- Enzyme, Enzyme kinetics and regulatio	To obtain a general knowledge about how enzymes work To study of enzyme kinetics and its regulations in biochemical reactions	Students will be able to know or learn the concepts of enzymes, enzyme kinetics and regulation of enzymes in biochemical reactions
Unit –II: Extraction, purification and assay of enzymes	To study of extraction processes of enzyme and understand the quality of enzyme through purification and assay	Students will be able to know extraction processes, purification and assay of enzymes
Unit III: Assimilation of: Carbon, Nitrogen and Sulphorous	To study the metabolic reactions of microorganisms for assimilation of carbon, nitrogen and sulphur	Students will be able to know the concepts of metabolic reactions of microorganisms.
Unit – IV: Bioenergetics	To study how living organisms acquire and transform energy in order to perform biological work and metabolic pathways	Students will be able to know or learn the concepts of bioenergetics and metabolic pathways.
Unit-V:- Biosynthesis of Nucleotides, Protein and Peptodoglycan	To study or learn the concepts of biosynthesis of Nucleotides, Protein and Peptidoglycan	Students will be able know or learn the concepts of biosynthesis

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COURSE OUTCOME

Name of Department ____Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI : Sem V		
COURSE NUMBER (PAPER NUMBER) : XV		
TITLE OF COURSE (NAME OF PAPER) Environmental Microbiology		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I : Air microbiology	To understand the environment , microorganisms in air , its pollution and its control	Students will know about microorganisms in air , their role and pollution studies
Unit II: Marine microbiology and Fresh water ecosystem	To aware about study of Water ecosystem To provide an intensive and in depth learning about various Fresh & marine water bodies	Students will apply the theoretical knowledge to study water ecosystem and apply various methods to control pollution
Unit III: Extremophiles	To study various extremophilic organisms , characters and their role	students will get more knowledge about diversity of microbes in the extreme environments.
Unit IV: Environmental impact assessment and Industrial Waste Management	To understand the effects of pollutants from industrial wastes on water bodies to the students.	Students will be able to think about impact of waste water and apply the knowledge in removal of pollution awarded of pollution control
Unit V Geomicrobiology	To study various techniques for extraction of metals and oil recovery from low grade ores oil wells respectively	Students may enriched with knowledge of various aspects environmental microorganisms.

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COURSE OUTCOME

Name of Department ___Microbiology_____

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.		
NAME OF SUBJECT : Microbiology		
SEM I / II / III / IV / V / VI VI		
COURSE NUMBER (PAPER NUMBER) DSE-3 paper MIC-XVI		
TITLE OF COURSE (NAME OF PAPER) Clinical microbiology-I		
COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I Clinical bacteriology	To inculcate knowledge in relationship between human disease and bacterial pathogens, their pathogenicity, laboratory diagnosis and treatment methods	Students will acquire knowledge aboutetiology,epidemiology,pathogenicity laboratory diagnosis,prophylaxis of bacterial diseases
Unit II: Clinical mycology	To inculcate knowledge in relationship between human disease and fungal pathogens, their pathogenicity, laboratory diagnosis and treatment methods	Students will acquire knowledge aboutetiology,epidemiology,pathogenicity laboratory diagnosis,prophylaxis of fungal diseases
Unit III: Clinical parasitology	To inculcate knowledge in relationship between human disease and protozoal pathogens, their pathogenicity, laboratory diagnosis and treatment methods	Students will acquire knowledge aboutetiology,epidemiology,pathogenicity laboratory diagnosis,prophylaxis of protozoal diseases
Unit IV: Clinical virology	To inculcate knowledge in relationship between human disease and viral pathogens, their pathogenicity, laboratory diagnosis and treatment methods	Students will acquire knowledge aboutetiology,epidemiology,pathogenicity laboratory diagnosis,prophylaxis of viral diseases
Unit V : Chemotherapy	To study drugs antibiotics their mechanism of action,drug resistance	Students will gain the knowledge of drugs antibiotics their mechanism of action and drug resistance

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Department of Zoology
B.Sc. ZOOLOGY
PO and CO
Programme Outcome

- This program is the fundamental unit of basic sciences studied at Graduate level underlying the academic field of Zoology and its different subfields centered of vertebrates, physiology and biochemistry, genetics and evolutionary biology, animal biotechnology, applied Zoology, aquatic biology, immunology, reproductive biology, and insect, vectors and diseases, apiculture, ayurvedic fish keeping, medical diagnostics, and sericulture) (ii) procedural knowledge that creates different types of professionals in the field of Zoology and related fields such as, apiculture, medical diagnostics, and sericulture, etc.(iii) skills related to specialization areas within Zoology as well as within subfields of Zoology, including broader interdisciplinary subfields (Chemistry, bio-Physics and Mathematics).
- Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms.
- The courses should be delivered in terms of concepts, mechanisms, biological designs & functions and evolutionary significance cutting across organisms at B.Sc. level. These courses should be studied by students of all branches of biology.
- Both chalk and board, and PowerPoint presentation can be used for teaching the course.
- The students should do the dissertation/ project work under practical of different courses, wherever possible.
- Analyse complex interactions among the various animals of different phyla, their distribution and their relationship with the environment
- Apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
- Apply the knowledge and understanding of Zoology to one's own life and work.
- Develops empathy and love towards the animals.
- The program helps to develop scientific tempers and attitudes, which in turn empower to be beneficial for the society since the scientific developments can makes nation or society to grows at a rapid pace.
- This will provide them ample opportunities to explore different career avenues.
- The program will also provide a platform for classical genetics in order understand distribution of inheritance of different traits.
- Science graduates can go to serve in industries or may opt for establishingtheir own industrial unit.
- Practical and theoretical skills gained in this program will be helpful in designingdifferent public health strategies for social welfare.
- They should be able to appreciate shifting their orientation of learning from a descriptive explanation of biology to a unique style of learning through graphic designs and quantitative parameters to realize how contributions from research and innovation have made the subjects modern and applied and laid the foundations of Zoology, Animal Sciences, Life Sciences, Molecular Biology and Biotechnology.

Head of the Department
Zoology

Principal
Hemuji Chandsi College
Kalyan(W) Tal-Dist Thane

- These courses and their practical exercises will help the students to apply their knowledge in future course of their career development in higher education and research.
- In addition, they may get interested to look for engagements in industry and commercial activities employing Life Sciences, Molecular Biology and Biotechnology.
- The program has been designed to provide in-depth knowledge of agrobiodiversity ensuring the inculcation of employment skills so that students can achieve a career and become an entrepreneur in diverse fields.
- After Undergraduate, students can get admission to M.Sc. Zoology, M.Sc., Environmental Science, M.Sc., Biotechnology etc.
- The successful students will be able to establish research organizations with the help of agriculture, environment protection and also their own industry for transgenic animals, clinical pathology, genetic counseling, human karyotyping etc. Scientific Research Organizations, Universities in India & abroad.
- Contributes the knowledge for Nation building.

Course Outcome :

B.Sc. I Sem- I	
PAPER I: Animal Diversity- I Theory and Practical	• Provides students with an in-depthknowledge of the diversity in form, structure and habits of invertebrate. • Learn basics of systematics and understand hierarchy of different categories. • Obtain overview of economically important invertebrates. • Classify all the invertebrate phyla up to class. • Develop understanding in the diversity of the life in regards to protists and Non chordates. • Group the animals on the basis of morphologicalstructures. • Develop critical understanding about evolution of animals and acquire knowledge of both living and extinct animals.Paper
PAPER II Animal diversity-II Theory and Practical	• Provides students with an in-depth knowledge of the diversity in form, structure and habits of vertebrates. • Learn general characters and classification of different classes of vertebrates. • Understand the vertebrate evolutionary tree. Obtain overview of economically important vertebrates.
B.Sc I Sem- II	

PAPER III Comparative Anatomy of vertebrates Theory and Practical	• This course provides students with the basic knowledge in vertebrate anatomy and biology from both functional and evolutionary points of view. • Students also gain knowledge about fundamental steps in vertebrate development from fertilization to organogenesis. • The students will be able to describe the vertebrate structures and relate morphology, function and evolution.
PAPER- IV Developmental Biology of vertebrates Theory and Practical	• Be able to list the types of characteristics that make an organism ideal for the study of developmental biology. • Know the broad phylogenetic relationships of animal phyla. • Be able to describe the stages and cellular mechanisms like invagination of gastrulation in the frog and chick . Be able to describe the functions of gastrulation. • Be able to describe in general terms how vertebrates gastrulate (frog, fish, chick, and mammal). • Be able to label macromeres, mesomeres, and micromeres and know which cell types are derived from each of these cell layers in the early embryo (e.g. primary and secondary mesenchyme, ectoderm, endoderm, mesoderm).

B.Sc. II Sem- III Paper- V Cell Biology Theory and Practical	• Cellular architecture & their functions at organismic level. • This knowledge will help students in future to explore areas like oncology, medical diagnostics and Treatment. Understand the functioning of nucleus and extra nuclear organelles and understand the intricate cellular mechanisms involved. • Acquire the detailed knowledge of different pathways related to cell signaling and apoptosis thus enabling

	there to understand the anomalies in cancer. • Develop an understanding how cells work in healthy and diseased states and to give a "healthforecast" by analysing the genetic database and cell information. • Get new avenues of joining research in areas such as genetic engineering of cells, cloning, vaccines development, human fertility programme, organ transplant, etc.
Paper VI Principles of Ecology Theory and Practical	• Ecological principles & applications that govern the planet Earth • This knowledge will help students in future to explore areas like: biodiversity, conservation biology, forestry & natural resource management. • Know the evolutionary and functional basis of animal ecology. • Understand what makes the scientific study of animal ecology a crucial and exciting endeavor. • Engage in field-based research activities to understand well the theoretical aspects taught besides learning techniques for gathering data in the field. • Analyze a biological problem, derive testable hypotheses and then design experiments and put the tests into practice. • Solve the environmental problems involving interaction of humans and natural systems at local or global level.
B.Sc. II Sem-IV	•
PAPER-VII: Fundamentals of Biochemistry Theory and Practical	• Understand the structure and biological significance of carbohydrates, amino acids, proteins, lipids and nucleic acids. • Understand the structure and function of immunoglobulins. Understand the concept of enzyme its mechanism of action and regulation. • Understand the process of DNA replication, transcription and translation.

	• Learn the preparation of models of peptides and nucleotides. • Learn biochemical tests for amino acids, carbohydrates, proteins and nucleic acids. • Learn measurement of enzyme activity and its kinetics.
PAPER-VIII Animal Physiology: Controlling and Coordinating Systems Theory and Practical	• Acquire knowledge of the coordinated physiological functioning. • Realize that very physiological mechanisms are used in very diverse organisms. • Understand how cells, tissues and organisms function at different levels. • Develop an understanding of the related disciplines such as cell biology, neurophysiology, pharmacology, biochemistry etc. Get a flavor of research by working on project besides improving their writing skills. • It will further enable the students to think and interpret individually. • Undertake research in any aspect of animal physiology in future.

Head of the Department
Zoology

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Department Of Computer Science

Program Outcome

B.Sc. I – Computer Science

- Historical development of Computer Science.
- Scope of Computer Science .
- Application And Uses of Computer Science.
- Introduction of operating system.
- Introduction of Application software such as Microsoft office .
- Concept of Green IT .
- Introduction of Programming languages such as machine ,Assembly, High level Language. Study of 'C' Programming Language
- Introduction Of Web Designing with HTML ,CSS and Java script .

Program Outcome [B.Sc. II – Computer Science]

- Introduction of Data Structure such as Stack, Queue,linked list, Graph Searching ,Sorting Tree.
- Study of Software Engineering
- Introduction of Object Orientated programming language core Java Language
- Study of Database Management System

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Program Outcome [B.Sc. III-Computer Science]

- To Understand how to design ,implement ,test , debug C # Application
- To study the concept of Object oriented programming such as threading ,windows application
- To understand the concept of Core Java programming
- Operating System Concept such as Processes management ,Storage Management
- To create Python Application
- To Study and create Web application using ASP.Net ,Advance Java
- To Study the Data communication and Networking concept
- Introduction Of software testing concept

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Department Of Computer Science

Laboratory Skills: Computer Science students would master the following laboratory skills

- Work with standard lab safety protocols and procedures.
- Work effectively in a team environment.
- document and maintain a record of all lab activities.
- DOcument and report on experimental protocols, results and conclusions
- review procedures and put them into your own words.
- understand and use of Computer System.
- Preparation of Algorithm and flowchart before doing Program.
- use appropriate methods to do Programming
- Analysis the Programming concept
- use common lab equipment
- Understand the programming Problem in different language and solve them in own words
- prepare the small Project of any language such as C#,C,Web technology and Python

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Computer Science
SEM I / II / III / IV / V / VI	Sem.- I
COURSE NUMBER (PAPER NUMBER) -Paper -I	
TITLE OF COURSE (NAME OF PAPER): Fundamental of Computer	

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit-I **Unit I-Introduction to Computer** Introduction to computers, Evolution of personal computers, Generation of computers, Elements of a computer processing system- Hardware & Software, various categories of software, Computer Organization Overview-CPU, I/O devices, storage devices and media, Various type of displays and other peripherals used in PCs.	Learn and practice basic concepts of computers, types of computer, software, hardware input devices like keyboard and mouse etc.	Successful students will able to learn computer peripherals, types, knowledge of software & hardware etc.
Unit-II **Operating System Concept** Introduction to Operating system, Purpose of Operating Systems, services and features of OS, Types of Operating System, Components of OS. Introduction to PC Operating Systems:- DOS, Windows operating System, Linux operating system, Concept and working with files and folders. Introduction to Mobile Operating System: -Android, Windows, IOS, Symbian **Introduction to Green IT:**-Environmental Impacts of IT, Holistic Approach to Greening IT, Green IT Standards and Eco- Labelling, Enterprise Green IT Strategy , Green IT: Burden or Opportunity?Hardware: Life Cycle of a Device or Hardware, Reuse, Recycle and Dispose Software: Introduction, Energy-Saving Software Techniques, Evaluating and Measuring Software Impact to Platform Power	learn basic concepts of computer and mobile Operating System Concept and Green IT concept	Understanding the concept of Operating system, services and features of OS, Introduction to Mobile Operating System: -Android, Windows, IOS, Symbian

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Unit III:-Microsoft Office Microsoft Word:-Introduction to MS Word, opening, closing, saving, deleting document, page setting, formatting page, formatting text, adding images, Header footers, border and shading, bullets, mail merge, Table, graphics, label, Templates, Wizards and Printing Techniques. Microsoft Excel:- Introduction to excel, File management in excel, operations related to workbook, Formatting sheet, adding formulae and functions, charts and maps, data	learn basic word processing skills with Microsoft Word, such as text input and formatting, editing, cut, copy and paste, spell check, margin and tab controls, keyboard shortcuts, printing. As well as how to include some graphics such as pictures and charts.	Successful students will be able to create PowerPoint presentation, Word documents, Excel knowledge
menu, view menu, work with multiple workbooks, importing and exporting of data. Microsoft PowerPoint: Introduction and Applications of Power Point, Create a New Presentation, Adding Slides, Clip Arts, Smart art, Charts, Text , images and other objects, Templates and Master Slides, Giving Animation effects, Links and Action buttons		

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Computer Science
SEM I / II / III / IV / V / VI	Sem - I
COURSE NUMBER (PAPER NUMBER)	Paper -II
TITLE OF COURSE (NAME OF PAPER)	Programming Using C-I

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I -Introduction to Programming Programming languages (Machine Languages, Assembly Languages, High level languages) Compiler, Assembler, Interpreter ,Planning the Computer Program Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, documentation, Concept of Algorithm, Characteristics, Notation of Algorithm, Designing Algorithms Writing step by step procedure, Flowcharts- Definition, Symbol, features, Representation in terms of Flow chart, Advantages and Limitations of Flow Charts, Pseudo code generation, Tracing, Testing.	Learn and practice basic concepts of Programming types of computer languages , and learn the algorithm ,flowchart etc.	Successful students will able to learn computer Languages ,types language of etc.
Unit II -Introduction to 'C' History, Features of C, Structure of 'C' programming, C-Tokens, Data types, Operators, Control Statements- Conditional control statements, Looping, Unconditional control statements	learn basic concepts of computer Language 'C' ,control structure ,data types etc.	Understanding the concept: History, Features of C, Structure of 'C' programming, C-Tokens, Data types, Operators, Control Statements

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Unit III :-Arrays and String Array definition and declaration, Types of array, Accessing Array, array manipulation, searching, Insertion, deletion of an element from an array, Basic matrix operations, dynamic array, String: Declaration and Initialization of String, operation on string, Inbuilt String handling functions, arithmetic operation on string, table of string	Learn Array and string concept such as Types of array, Accessing Array, array manipulation, searching, Insertion, deletion of an element from an array, basic matrix operations, dynamic array and String handling	Successful students will be able to create program of Array and String

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Computer Science
SEM I / II / III / IV / V / VI	Sem - II
COURSE NUMBER (PAPER NUMBER) Paper III	
TITLE OF COURSE (NAME OF PAPER): Introduction to Web Designing	

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit-I **Introduction to HTML & HTML5 and CSS:** Introduction to HTML, Overview of basic HTML , Structure of HTML, Creating and opening HTML file, Singular and paired tags, Text formatting tag, Anchor tag, Lists, Image, Image Map, Table, Frames and Framesets, HTML5: Introduction to HTML5, Need of HTML5, DOCTYPE Element, Tags-Section, Article, aside, header, footer, nav, dialog, figure etc. Events in HTML5, Input tag (Type, Auto focus, placeholder, required etc. attributes.) in HTML5, Graphics in HTML5, Media tags in HTML5	Learn and practice basic concepts of HTML & HTML5. Introduction to Internet, Requirements for Internet.	Successful students will able to design web pages using HTML & HTML5 languages, also students get the knowledge of Internet & Networking concepts.
Unit-II **Introduction to CSS** Introduction to CSS, Use of CSS, Types of CSS, Selectors, Properties, Values, CSS Properties - Background, Text, Fonts, Link, List, Table, Box Model, Border, Margin, Padding, Display, Positioning, Floating, Opacity, Media type, Backgrounds and Borders Images, Values and Replaced Content, Text Effects, 2D/3D Transformations, Animations, Multiple Column Layout, User Interface, CSS interact with JavaScript.	Learn basic concepts of CSS, types of CSS, how to add Border, Margin, Padding, Display etc in web pages.	Understanding the concept of CSS, How to apply CSS in web pages. Insert a graphics within a web page. Create a link within a web page. Create a table within a web page.

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Unit –III JavaScript Introduction to JavaScript , JavaScript Variables & Data types, Operators, Built in functions in JavaScript ,Control structure in JavaScript ,DOM, Math, Array, History, Navigator, Location, Windows, String, Date, Document objects, user defined function, Validation in JavaScript, event & event handling in JavaScript.	Understand the basics of JavaScript. Write the SCRIPT element for including JavaScript in a web page. Be able to write out to a page using document.write. Declare and set values for JavaScript variables.	Successful students will be able to create Use operators, variables, arrays, control structures, functions and objects in JavaScript. Map HTML using the DOM - Document Object Model. Identify popular JavaScript Libraries. Create dynamic styles. Create animation on a web page.

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Computer Science
SEM I / II / III / IV / V / VI	Sem - III
COURSE NUMBER (PAPER NUMBER)	Paper IV
TITLE OF COURSE (NAME OF PAPER)	Programming Using C-II

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I -Function and Pointer Definition, declaration, function prototypes, Local and global variables, User defined functions, Recursion, passing array and string to function, Storage classes Pointers-Definition and declaration, Operation on pointer ,Pointer initialization, Pointer and function, Pointer and array, Pointer of pointer, Call by value and Call By reference, Dynamic memory allocation	Understand the basics of Function and pointer such as recursion using function ,call by reference and call by value , Dynamic memory allocation	Successful students will able to design Program of function and pointer
Unit II -Structures and Union Definition and declaration, copying and comparing of structure, Array of structures, Passing structure tofunction, Pointer to structure, Nested structure, self-referential structure, Size of and type def, Definition and declaration of union, differences between structure, union and array	Understand the concept of tructure and union such as declaration,comparing of structure difference between structure ,unionand array	Successful students will be able to use structure and union in program
Unit III -File Handling Defining, opening and closing of file, operations on file, Standard input and output functions, formatted input and output functions, File opening modes, Error handling, Random access of file, command line argument, Macros and PreprocessingFeatures of C preprocessor, Macro – Declaration ,Expansion, File Inclusion, Graphics using C - VDU Basics, Simple library functions-get pixel, put pixel, line ,rectangle, circle, ellipse, arc etc.	Understand the basics of file handling such as input and output function ,file opening mode ,array handling ,macro definition ,use of graphics etc	Successful students will be able create program into file and graphics mode

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Data Structure
SEM. I / II / III / IV / V / VI	Sem - III
COURSE NUMBER (PAPER NUMBER)	paper -V
TITLE OF COURSE (NAME OF PAPER)	Data Structure

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1 Introduction of Data Structure, Need of Data Structure, Types of Data Structure, ADT, Stack, Introduction to stack, Representation- static & dynamic, stack Operations, Application -infix to postfix & prefix, postfix evaluation, recursion, expression validity. Queue: Introduction to Queue, Representation -static & dynamic, Operations, Circular queue, Double ended queue, priority queues, Applications of Queue.	To impart the basic concepts of data structures and algorithms To understand the concepts about stacks, queue, lists, trees and graphs	1. Differentiate primitive and non-primitive structures
Unit 2: Linked List: Introduction to Link, Implementation of List - static & dynamic representation, Types of Linked List, Operations on List, Applications of Linked List - polynomial manipulation Trees: Concept & Terminologies, Binary tree, binary search tree, Representation - static/ dynamic, Operations on BST - create, insert, delete, traversals (preorder, inorder, postorder), counting leaf, non-leaf & total nodes, Height balance tree- AVL, B tree, B+ Tree, Graph: Graph terminology, Representation of graphs, Graph Traversal: BFS (breadth first search),DFS (depth first search), Minimum spanning Tree	To understand concepts about searching and sorting techniques To impart the basic concepts of data structures and algorithms	Choose appropriate data structures and algorithms, understand the ADT/libraries, and use it to design algorithms for a specific problem

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BOC3.1(15) Sorting: Bubble sort, Quick sort, Simple Insertion sort, Shell sort, Address calculation sort, Selection Sort, Heap Sort, Merge sort, Radix Sort. Searching: Linear Search, Binary Search, and Tree searching methods, Multiway search tree, Hash function (open and close)	To impart the basic concepts of data structures and algorithms	Apply sorting and searching algorithms to the small and large data sets.

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Web Design using Bootstrap and WordPress
SEM I / II / III / IV / V / VI	Sem - III
COURSE NUMBER (PAPER NUMBER)	SEC-I
TITLE OF COURSE (NAME OF PAPER)	Web Design using Bootstrap and WordPress

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1 Introduction about Bootstrap, Bootstrap History, Why Use Bootstrap, Downloading Bootstrap, Bootstrap CDN, Downloading the Bootstrap Files, Understanding the File Structure Layout- Bootstrap Grid System, Creating Fixed Layout, Fluid Layout, Responsive Web Design or Layout, Bootstrap Typography Bootstrap Forms- Form control, Select, Checks & radios, Range, Input group, Floating labels, Layout, Validation Bootstrap Tables, Lists, Images, Media Objects, Icons	To study development of responsive website using bootstrap Web Design or Layout, Bootstrap Typography Bootstrap Forms- Form control, Select, Checks & radios, Range, Input group, Floating labels, Layout, Validation Bootstrap Tables, Lists, Images, Media Objects, Icons	Student have understood of history of Bootstrap and Web Design or Layout, Bootstrap Typography Bootstrap Forms- Form control, Select, Checks & radios, Range, Input group, Floating labels, Layout, Validation etc.
Unit 2 Bootstrap Components-Accordion, Alerts, Badge, Breadcrumb, Buttons, Button group, Card, Carousel, Close button, Collapse, Dropdowns, List group, Modal, Navbar, Navs & tabs, Offcanvas, Pagination, Placeholders, Popovers, Progress, Scrollspy, Spinners, Toasts, Tooltips Case study-Design e-commerce and your college website	To study the Bootstrap component such as Bootstrap Components- Accordion, Alerts, Badge, Breadcrumb, Buttons, Button group, Card, Carousel, Close button, Collapse, Dropdowns, List group, Modal, Navbar, Navs & tabs, Offcanvas, Pagination, Placeholders, Popovers, Progress, Scrollspy, Spinners, Toasts, Tooltips and case study	Student have understood and develop various types of bootstrap components and case study

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Unit 3 Introduction CMS And WordPress, Why CMS, Advantages and Disadvantages of CMS, com vs. WordPress.org Creating a Word Press Site, Installing Word Press, Setting up Word Press in Local Server, Logging into the Word Press Admin & General Site Settings Writing Posts & Formatting Text : Posts versus Pages, Creating a New Blog Post, Using the Visual Editor, Pasting Without Formatting & Clearing Formatting, Formatting Headings, Formatting Bulleted & Numbered Lists, Formatting Block Quotes, Publishing a Post, Deleting a Post, Restoring a Post from the Trash (or Deleting it Delete Permanently) Creating Pages, formating page, Publishing pages, Menu, Installing Themes, adding plugins, Working with Widgets	TO get knowledge of global Bootstrap CSS classes like images, typography, tables, grids, forms, buttons, and more the reusable bootstrap components including icons, dropdowns, alerts navbars, breadcrumbs, paginators, and many more. Utilize the bootstrap javascript Plugins to develop modern web pages. Customize Bootstrap's elements with fewer variables and jQuery plugins to build our version. Build attractive website using Word Press or Boot Strap	Understand global Bootstrap CSS classes like images, typography, tables, grids, forms, buttons, and more Understand the reusable bootstrap components including icons, dropdowns, alerts navbars, breadcrumbs, paginators, and many more. Utilize the bootstrap javascript Plugins to develop modern web pages. Customize Bootstrap's elements with fewer variables and jQuery plugins to build our version. Build attractive website using WordPress or Bootstrap

Lecturer

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Software Engineering
SEM I / II / III / IV / V / VI	SEM III
COURSE NUMBER (PAPER NUMBER)	Paper VI
TITLE OF COURSE (NAME OF PAPER)	Software Engineering

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1 System concepts: Introduction system, characteristics, Elements of system, Types of system, System Analysis, Role of System Analyst, Software Engineering: Definition, Characteristics of software, Qualities of software, System Development life cycle- Waterfall model, V-shape model, Spiral model, Prototyping, incremental, RAD, Agile.	To study fundamental concepts in software engineering, SDLC, software requirements specification, formal requirements specification and verification	At the end of the course, the student should be able to: Basic knowledge and understanding of the analysis and design of software systems.
Unit 2 Software requirements: Types of Requirements: System, Functional, Non-functional, User. Fact finding techniques: Interviews, Questionnaire, Record reviews, Observation. Analysis and Design Tools: Flow chart, Decision tables and Trees, Structured English, HIPO, System Design: Data flow Diagram (Physical, Logical), Entity relation diagram (ERD), Data Dictionary, structured chart, Input and output design, Case studies: Pay Roll, Fixed Deposit, Inventory system, College Admission System, Library System, Exam system etc.	To study the basic techniques for improving quality of software. Understand the fundamental principles of Software Engineering & will also have a good knowledge of responsibilities of project manager and how to handle them	Ability to apply software engineering principles and techniques to develop, maintain and evaluate large-scale software systems. To produce efficient, reliable, robust and cost-effective software solutions.
Unit 3 Coding: Coding standards, Size Estimation, Effort Estimation, and Cost Estimation, Software Testing: Need of Testing, types of testing, Software Implementation and Maintenance: Traditional and conventional approaches, conversion methods, Overview of maintenance process, types of maintenance, Software Quality Assurance, SQA Tools, Tools and Metrics, Software Reliability, Software risk management: definition, types of risk, risk identification, risk monitoring and management	To understand the basic knowledge of different models	Ability to perform independent research and analysis. Ability to work as an effective member or leader of software engineering team.

Head of the Department
Computer Science

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Core Java
SEM I / II / III / IV / V / VI	Sem.- IV
COURSE NUMBER (PAPER NUMBER) VII	
TITLE OF COURSE (NAME OF PAPER) Core Java	

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I: Introduction to Java Programming: Features of Java, Features of Java in programming language, Platform, JDK Environment and Tools Java Programming Fundamentals: Data types, Variables, Operators, Keywords, Naming Convention, Structure of Java Program, Flow Control- Decision, Iterations, Arrays, Object oriented programming in Java: Class – Members access control, Objects, Constructors, Use of 'this' key word, Static, non-static data members and methods., public, private & protected data members Inheritance & Polymorphism: Access Scope specifiers protected, Super, extends, single, multiple inheritance, Method overriding, Abstract classes & ADT, 'final' keyword, Extending interfaces	To understand how to design, implement, run, debug programs that use basic data types and computations, simple I/O, conditional and control structures, string handling and functions in Java. 2. To understand the importance of Classes & objects along with constructors and Arrays in Java.	Implement Object Oriented programming concepts using basic syntaxes of control structures, strings and functions for developing skills of logic building activity using Java. 2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem in Java.
Unit 2: Exception Handling: Exceptions and Types, try, catch, finally block, throw & throws statement, user-defined exceptions, Java I/O package, byte & character stream, reader & writer, file reader & writer Threading: Java thread lifecycle, Thread class & runnable interface Thread priorities & Synchronization, Usage of wait & notify Collection framework: - Collection overview, Collection interfaces, Collection classes Vector, Array list, Hash map, Hash table	To understand the principles of inheritance, interface and packages and demonstrate through problem analysis assignments how they relate to the design of methods, abstract classes and interfaces. To understand importance of multithreading & different exception handling mechanisms	Demonstrate how to achieve reusability using inheritance, interfaces and packages and develop Java applications development can be achieved. Demonstrate understanding and use of different exception handling mechanisms and concepts of multithreading for robust Java and efficient application development.
Unit 3: Introduction to JDBC, Components of JDBC, Architecture of JDBC, JDBC Drivers Introduction to Swing, difference between AWT and Swing, Hierarchy of Swing classes, Swing controls - JButton, JLabel, JTextFields, JRadioButtons, JCheckBox, JList, JComboBox, JMenus and JMenuBar,	To understand how to develop GUI applications using Swing and JDBC technology	Able to develop GUI applications using Swing technology

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COURSE OUTCOME

Name of Department: Computer Science

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	DBMS Using Oracle
SEM: I / II / III / IV / V / VI	Sem : - IV
COURSE NUMBER (PAPER NUMBER): - IX	
TITLE OF COURSE NAME OF PAPER: - DBMS Using Oracle	

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I: (08) Introduction to database system: Definition, Limitations of traditional file system, Advantages of DBMS, Components of DBMS, Database Architecture, Database Users, Schemas and instances, 2 tier and 3 tier architecture, Database languages, Types of data models: relational, Network, Hierarchical, Distributed. E-R model: E-R Diagram, entities, attributes and its types, Relationship and relationship sets, Cardinality, Degree, Generalization, Specialization, Aggregation. Relational Model and Database design: Relation, Domain, Tuples, types of keys, relational integrity rules, Dr. Codd's rules, Relational Algebra operations : Select, Project, Cartesian Product, Union, Set difference, Natural Join, Outer Join, Dependencies and its types, Normalization and its types-1NF, 2NF, 3NF, BCNF, lossless joins.	To understand the Fundamental concepts of database. 2. It helps in developing skills for the design and implementation of a database applications	Demonstrate the concepts of Relational database model, ER model and Distributed database. 2. Design E-R Model for given requirements and convert the same into database tables
Unit II: (08) Transaction Management & Concurrency Control: Introduction, Definition, properties, transaction states, scheduling and its types, conflict and view serializability, Introduction to Concurrency Control, problems of concurrency control, lock based protocols, timestamp based protocol, deadlock, deadlock handling, Database recovery and Atomicity, introduction, recovery algorithms, log base recovery, shadow paging, checkpoints or synchpoints or savepoints.	To understand creations, manipulation and querying of data in database	Apply the concepts of Transaction processing, Concurrency control, Database Recovery and Back up in applications.

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Unit 3: SQL: DDL, DML, DCL, select From, Where, Order by, Group by, Having, Joins, Union, Distinct, Between, In, Between, Different types of functions, Delete, Update, Insert, Nested queries, joins, create, alter and drop, constrain, index, views, Triggers, Grant, Revoke, Commit, Rollback, Savepoint Introduction to PL/SQL, Advantages, Architecture, Datatypes, Variable and Constants, Using Built_in Functions, Conditional, Looping and Sequence Statements, Cursor in PL/SQL: Types of Cursors, Cursor Attributes, Cursor with Parameter, Cursors with LOOPS Nested Cursors, Cursors with Sub Queries and procedure, Procedures in PL/SQL: STORED PROCEDURES, PROCEDURE with Parameters (IN,OUT and IN OUT), Dropping a Procedure. Functions in PL/SQL: Difference between Procedures and Functions, types of functions and parameter modes Triggerings in PL/SQL	9. Understanding SQL and PL/SQL	Use database environment such as SQL & PL/SQL

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COURSE OUTCOME

Name of Department: COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Visual Programming Using C#
SEM I / II / III / IV / V / VI	Sem V
COURSE NUMBER (PAPER NUMBER) :	
TITLE OF COURSE (NAME OF PAPER) :	Visual Programming Using C#

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Introduction to NET and C# Block diagram of .net framework, The Common Language Runtime, Advantages of Managed Code, A Closer Look at Intermediate Language & Assemblies, Support for Object Orientation and Interfaces, Distinct Value and Reference Types, Strong Data Typing, Garbage Collection, Compiling and Running the Program, Variables, Data Types, Flow Control, Expressions, Namespaces, The using Statement, Namespace Aliases, The Main() Method, Multiple Main() Methods, defining & using functions & its scope, Passing Arguments to Main(), Parameter passing techniques.	To understand how to design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.	Implement Object Oriented programming concepts using basic elements of control structures, strings and functions for developing skills of logic building activity using Java.
Unit 2: Object oriented programming in C# Classes and Structs, Class Members- Data Members, Function Members read-only Fields, properties and indexer, The Object Class System, Object Methods, The ToString() Method **Inheritance and Polymorphism:** Introduction, Types of Inheritance, Implementation Inheritance, Abstract Classes and Functions, Sealed Classes and Functions, Constructors and its types, Destructors, Interfaces- Defining and Implementing Interfaces, Derived Interfaces, Polymorphism- Method overloading, Operator overloading.	Discuss the principles of inheritance, interface and package and demonstrate through problem analysis assignments how they relate to the design of methods, abstract classes and interfaces and packages.	Demonstrate how to achieve reusability using inheritance, interfaces and packages and develop Better application development can be achieved.
Unit 3:- Exception, Threading, Delegate and IO:- Exception Handling:- Try, catch, and throw, Finally, Nested try, Custom exception **Threading:-** Introduction- Applications with Multiple Threads, Thread Priorities, Synchronization, Life Cycle **Delegate and Events:-** Delegates, Types of delegates- single cast, multicast and Anonymous delegates, **Event IO and Collection Classes:-** Stream Classes, Console I/O, File Stream and Byte-Oriented File I/O.	To understand importance of Multi-Threading & different exception handling mechanism.	Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.

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Controls: Conversion to Control Group, Date Control Group, Delay control Group, Continuous control Group, Menus and Control Menus, Menu Bars, Dialogue Box, RTI and MIS Applications	Dialogue Edit Name windows application using C#	Dialog or dialog windows application using C#

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COURSE OUTCOME

Name of Department: COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Core Java
SEM : I / II / III / IV / V / VI	Sem V
COURSE NUMBER (PAPER NUMBER)	Paper X
TITLE OF COURSE (NAME OF PAPER)	Core Java

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Introduction to Java Programming Overview of Java, Features of Java as programming language ,Platform, IDE Environment and tools **Java Programming Fundamentals**-Data types, Variables, Operators, Keywords, Naming Conventions, Structure of Java Program, Flow Control- Decision, Iterations, Arrays,	To understand how to design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions. To understand the importance of Classes & objects along with constructors, Arrays and Vectors	Implement Object Oriented programming concepts using basic syntaxes of control Structures, strings and function for developing skills of logic building activity using Java
Unit 2: Object oriented programming in Java Class – Members access control, Objects, Constructors, Use of 'this' keyword, Static, non-static data members and methods., public, private & protected data members **Inheritance & Polymorphism**-Access/Scope specifiers protected, Super, extends, single, multiple inheritance, Method overriding, Abstract classes & ADT, 'final' keyword, Extending interfaces	Discuss the principles of inheritance, interface and package and demonstrate through problem analysis assignments how they relate to the design of methods, abstract classes and interfaces and packages.	Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem in Java. 2. Demonstrate how to achieve reusability using inheritance, interfaces and packages and describes Enter application development can be achieved
Unit 3: Exception Handling, Threading and Collection framework Exceptions and Types, try, catch, finally block, throw & throws statement, user-defined exceptions, Java I/O package, byte & character streams, reader & writer, file reader & writer **Threading**-Java thread lifecycle, Thread class & runnable interface Thread priorities & synchronization, Usage of	To understand importance of Multi-threading & different exception handling mechanisms	Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust, faster and efficient application development

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Web Activity **Collections framework :-** Collections overview, Collection interfaces, Collection classes Vector, Array list, Hash map, Hash table, Tree map, Tree set, Hash set, Properties, Stack		
Unit 4: Swing and event handling: Introduction to swing, difference between AWT and swing, hierarchy of swing classes, Swing controls :- JButton, JTextfield, JLabel, JCheckBox, JRadioButton, JFrame, JTable, JList, JOptionPane, JMenuItem and JMenu etc	To understand how to develop GUI applications using Swing technology	Ability to develop GUI applications using Swing technology

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COURSE OUTCOME

Name of Department: COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Operating Systems
SEM I / II / III / IV / V / VI	Sem - V
COURSE NUMBER (PAPER NUMBER)	Paper XI
TITLE OF COURSE (NAME OF PAPER)	Operating System

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Introduction Operating System:- Definition Operating systems, Types of Operating Systems-Batch, Multiprogramming, Time-Sharing, Real-Time, Distributed, Parallel, OS Service, System components, System Calls, OS Structure: Layered, Monolithic, Microkernel Operating Systems - Concept of Virtual Machine	To understand the main components of an OS & their functions	Describe the important computer system resources and the role of operating system in their management policies and algorithms
Unit 2: Process Management: - Concept of Process, Process states, Process Control Block, Context switching, Operations on Process, Co-operating Process, Threads - Types of threads, Benefits of threads Concept of Process Scheduling- Types of Schedulers, Scheduling criteria, Scheduling algorithms- Preemptive and Non-preemptive - FCFS, SJF, Round Robin, Priority Scheduling, Multilevel Queue Scheduling, Multilevel- feedback Queue Scheduling	To study the process management and scheduling	Understand the process management policies and scheduling of processes by CPU
Unit 3: Process Synchronization and Deadlocks: - The Producer Consumer Problem, Race Conditions, Critical Section Problem, Semaphores, Classical Problems of Synchronization: Reader-Writer Problem, Dining Philosopher Problem, Critical Regions: Definition, System Model, Dead Lock Characterization, Resource Allocation Graph, Methods of Handling Dead Locks- Deadlock Prevention, Deadlock Avoidance -banker's algorithm, resource request algorithm, Deadlock detection and Recovery.	To understand the concepts and implementation Memory management policies and virtual memory.	Evaluate the requirement for process synchronization and coordination handled by operating system
Unit 4: Storage Management :Memory Management: - Basic Hardware Address Binding, Logical and Physical address Space, Dynamic Loading, Overlays, Swapping. **Memory allocation:** Contiguous Memory allocation - Fixed and variable partition -	To understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used	Describe and analyze the memory management and its allocation policies. 5. Identify use and evaluate the storage

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Internal and External fragmentation and Compaction, Paging, Segmentation, Basics of Virtual Memory, Demand paging, Page fault, Page Replacement policies: Optimal (OPT), First in First Out (FIFO), Least Recently used (LRU), Thrashing. **Storage Management:** – File Management: File concept, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free space management (bit vector, linked list, grouping). **Disk Management:** disk structure, disk scheduling (FCFS, SSTF, SCAN, C-SCAN), disk reliability, disk formatting, boot block, bad blocks.	to implement the different parts of OS	management policies with respect to different storage management technologies

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COURSE OUTCOME

Name of Department: COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Python
SEM. I / II / III / IV / V / VI	Sem - V
COURSE NUMBER (PAPER NUMBER)	Paper XII
TITLE OF COURSE (NAME OF PAPER)	Python

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit I - Introduction to Python: Features/Characteristics of Python, Installation and Working with Python, Structure of a Python Program, Writing simple python program, Executing python program using command line window and IDLE graphics window, Python Virtual Machine, Identifiers and Keywords, Operators (Arithmetic operators, Relational operators, Logical or Boolean operators, Assignment operators, Bit wise operators, Membership operators, Identity operators), Operator Precedence and Associativity. **Python Data Types:** -Python Variables, Data types in python, Built-in Datatypes, Basic datatypes, Sequences in python, Sets, Literals in python, User Defined Datatypes, Constants in python, Type conversion, Input and Output Statements, Command line arguments **Control Statements:** -Conditional Statements: if, if-else, nested if-elif-else, Looping: for, while, nested loops, Loop manipulation using pass, continue, break, assert and else suite.	Basics of Python programming, Decision Making and Functions in Python	Describe the Numbers, Math functions, Strings, Lists, Tuples and Dictionaries in Python, Express different Decision Making statements and Functions
Unit II - Strings, Collection Lists, Tuples, Dictionaries, Functions and, Modules: Strings: Introduction to String, String manipulation, Collection List: Introduction to List, Manipulating lists, Tuples: Introduction to Tuples, Manipulating Tuples, Dictionaries: Concept of Dictionary, Techniques to create, update & delete dictionary items. **Functions, Modules** – Difference between a function and a Method, Functions - Defining a function, Calling a function, Advantages of functions, Types of functions, Function arguments, Flow of execution, Actual	Decision Making and Functions in Python	Express different Decision Making statements and Functions

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parameters, Anonymous functions, Global and Local variables, **Modules:-** Importing module, Creating & exploring modules, Math module, Random module, Time module		
Unit 3:- Object Oriented Programming Features, Concept of Class & Objects, Constructor, Types of Variables, Namespaces, Types of Methods, Inner Classes, Constructors in Inheritance, Overriding Super: Class Constructors and Methods, Types of Inheritance, Abstract Classes and Interfaces, The Super() Method, Operator Overloading, Method Overloading, Method Overriding	Object Oriented Programming using Python	Implement Object oriented programming in Python
Unit 4: Regular Expressions, Exception Handling and File Introduction to Regular Expression, Advantages & Operations, Sequence Characters in Regular Expression, Powerful pattern matching and searching, Password, email, url validation using regular expression, Pattern finding programs using regular expression **Exception :-** Errors in a Program, Exceptions, Exception handling, Types of Exceptions, User defined Exceptions **Python File Operations:-** Types of File, Opening and Closing a File, Reading and writing to files, Manipulating Directories	Regular expression for pattern matching	Understand Regular expression and Implement for pattern matching

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COURSE OUTCO

Name of Department: COMPUTER SCIENCE

B.A / B.Sc. / M.A / M.Sc.	B.Sc
NAME OF SUBJECT	Linux
SEM I / II / III / IV / V / VI	Sem - V
COURSE NUMBER / PAPER NUMBER	Paper XIII
TITLE OF COURSE (NAME OF PAPER)	Linux

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Introduction of Linux:- History of Linux, Architecture of Linux system & features, Kernel, Shell & its type, Difference between Windows and Linux, Linux Distributions, Working environment: KDE, GNOME, Xfce4, Hardware requirements, Installation procedure of Linux, Create partitions, Configuration of X system, Users & Groups Management:- Create Users, Create groups, Special groups,Assigning permissions to users and Groups, File and Directory permissions - chmod, chown,chgrp. **Linux File System:-** Hierarchy of File system, File System parts - Boot Block, Super Block, Inode Block, Data Block, File types, Devices and Drives in Linux, Mounting devices (CD/DVD, usb, hard drive partition), file system	To introduce Basic Linux general purpose Commands	Identify the basic Linux general purpose commands
Unit 2: Linux Command Linux commands: File and directory Management Commands: mkdir, rmdir, cd and pwd, file ls, cat, more, less, File and Directory Operations: find, cp, mv, rm, ln etc. Finding the files - locate, whereis etc. **Filter Commands & Editor:-** Filters, head, tail, pr, cut, paste, sort, uniq, tr, grep, egrep, fgrep and **Communication commands:-** mesg, talk, write, wall, mail **Text Editors** - vi, vim, Archive and File compression commands **Shell Programming:** - Shell Variables, Meta characters, Shell Scripts - Control and Loop structure, I/O and Redirection, Piping	To learn different editor To learn shell script concepts	Apply and change the ownership and file permissions using advance Linux commands
Unit 3: Linux System Management: Process Management: Shell process, Parent and children, Process Status, System process,	To learn file management and permission advance commands	4. Implement shell scripts

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Multiple jobs in background and foreground. Changing process priority with nice. Listing processes, jobs, kill, premature termination of process. **Disk management and System Administration**-Disk Partitioning - RAID, LVM etc., disk related Management Tools Fdisk, Parted etc. Boot Loaders GRUB, LILO, Custom Loaders		
Unit 4:-Linux System and Network Administration System administration - Role of system administrator, identifying administrative tasks & files, Configuration and log files. Chkconfig, Security Enhanced Linux, Installing and removing packages with rpm command **Understanding various Servers** - DHCP, DNS, Squid, Apache, Telnet, FTP, Samba	To learn awk, grep, perl script	Apply basic of administrative task

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COURSE OUTCOME

Name of Department : COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Web Technology
SEM I / II / III / IV / V / VI	Sem VI
COURSE NUMBER (PAPER NUMBER)	Paper XIV
TITLE OF COURSE (NAME OF PAPER)	Web Technology

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Introduction to ASP.Net Introduction to Web Architecture Model, Introduction to Visual Studio for Web Application,Internal development of ASP.Net **Application and Page Frameworks** Application Location Options, Built-In Web Server, IIS FTP, Web Site Requiring Page Extensions, The ASP.NET Page Life Cycle, The ASP.NET Page Structure Options, Inline Coding, New Code-Behind Pages, ASP.NET 2.0 Page Directives, @Page, @Master, @Control, @Import, @Implements, @Register, @Assembly, @PreviousPageType, @MasterType, @OutputCache,@Reference, ASP.NET Page Events, Dealing with PostBacks, Cross-Page Posting, ASP.NET Application Folders, \App_Code Folder, \App_Data Folder, \App_Themes Folder, \App_GlobalResources Folder, App_LocalResources, \App_WebReferences, \App_Browsers,Compilation, Global.asax	To understand basic of ASP.Net	Understand basic of ASP.Net and web application
Unit 2: ASP.NET Server Controls and Validation Controls ASP.Net Server Controls, Understanding Validation, Client-Side versus Server-Side Validation,ASP.NET Validation Server Controls, Validation Causes, The RequiredField Validator Server Control, The CompareValidator Server Control, The RangeValidator Server Control, The RegularExpressionValidator Server Control, The CustomValidator Server Control, The ValidationSummary Server Control, Turning Off Client-Side Validation, Using Images and Sounds for Error Notifications, Working with Validation Groups **Master Pages:** Introduction of Master Pages,	To understand different server controls used in ASP.Net for web application	Use different ASP.Net web server controls in developing web application

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The Basics of Master Pages, Coding a Master Page, Coding a Content Page, Mixing Page Types and Languages, Specifying Which Master Page to Use, Working with the Page Title, Working with Controls and Properties from the Master Page, Specifying Default Content in the Master Page, Programmatically Assigning the Master Page, Nesting Master Pages, Master Page Events, Themes and Skins		
Unit 3: ASP.Net State Management, Navigation and Security Application State, Session State, Client & server storing, View state, Cache, Hidden Variable, Session object, Profiles, Overview of HTTP Handler & Modules**Site Navigation:-** Site Navigation technique, SiteMap file, SiteMapPath, TreeView and MenuView control, Using XML file **ASP.NET web security:-** Authentication & Authorization, Windows & forms, User Identity, User Profiles, Using Data Adapter, Debugging & error Handling, ASP.Net tracing, Page Level, Application Level, Debugging, Start Debugging session, Client side debugging, Exception Handling, On page, HTTP status code,	To understand master page concept To learn how to maintain state and security in web application.	Use master page for interactive design Maintain state and security in web application.
Unit 4: ADO.Net and AJAX **Data Access with ADO.NET:-** ADO.NET Overview, Using Database Connections, Executing Commands, Calling Stored Procedures, Fast Data Access: The Data Reader, Data Adapter **Introduction to AJAX:-** Introduction to AJAX and Need of AJAX, Server side and Client side architecture ScriptManager, UpdatePanel, Timer control.	To understand database connectivity with web application.	Connect any database with web application.

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COURSE OUTCOME

Name of Department : COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Data Communication and Networking
SEM : I / II / III / IV / V / VI	Sem. VI
COURSE NUMBER (PAPER NUMBER)	Paper XVI
TITLE OF COURSE (NAME OF PAPER)	Data Communication and Networking

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1. Introduction to Data Communication & Networking Data Communication: Components, Data Flow, Protocols & Standards, Design Issues of Layers, Connection oriented and connection less services, Network models : OSI-OSI reference model, TCP/IP reference model.	Study the basic taxonomy and terminology of the computer networking and understand the layers of OSI model and TCP/IP model.	Describe the functions of each layer in OSI and TCP/IP model
Unit 2. Physical layer Signals: Analog & Digital Signals, Period, Frequency, Phase, Amplitude, Bandwidth, Bit Rate, Bit Length, Fourier analysis, Transmission Impairment: Attenuation, Distortion, Noise, Nyquist Theorem, Shannon Capacity Theorem, Transmission Media: Guided Media-Magnetic Media, Twisted Pair, Coaxial Cable, Fiber Optic Cable Unguided Media: Wireless- Radio Waves, Microwaves, Infrared, Satellite Communication Digital Transmission: Manchester & Differential Manchester Coding, Pulse Code Modulation Modulation: Amplitude Modulation, Frequency Modulation, Phase Modulation Transmission Mode: Parallel, Serial, Synchronous Transmission, Asynchronous Transmission Multiplexing: Frequency Division Multiplexing, Time Division Multiplexing, Wavelength Division Multiplexing Switching: Circuit Switching, Message Switching, Packet Switching.	Acquire knowledge of Application layer and Presentation layer paradigms and protocols.	Explain the functioning of Application layer and Presentation layer paradigms and Protocols.
Unit 3. Data link layer Error Detection & Correction: Types of Errors, Hamming Distance, Error Detection: Parity Check, Cyclic Redundancy Check, Checksum Check, Hamming code Data Link Control: Framing, Flow & Error Control Protocols: Simplex, Stop and Wait, Stop and Wait ARQ, Go Back N ARQ, Selective repeat ARQ.	Study data link layer services, design issues, and protocols	Describe the functions of data link layer and explain the protocols

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Unit 4. Network layer , Transport, Session, Presentation & Application layers Network layer Design issues, Routing Algorithm: Optimality Principle, Shortest Path Routing, Distance Vector Routing, Link State Routing, Congestion Control Algorithm: General principle of congestion control, Congestion prevention policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets Network Devices-Hubs, Switches, Repeaters, Bridges, Routers, Gateways **Transport, Session, Presentation & Application layers** TCP/IP protocol suite :- UDP,TCP,SCTP, IP, RTP, FTP, DNS, TELNET, SMTP, POP, HTTP, WWW, SNMP,ARP, RARP Data Compression:- Audio Compression, Video Compression	Read the fundamentals and basics of Physical layer, and transmission media with will apply them in real time and time applications.	Explain the types of applications

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COURSE OUTCOME

Name of Department: COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Advanced Java
SEM I / II / III / IV / V / VI	Sem VI
COURSE NUMBER (PAPER NUMBER)	Paper XV
TITLE OF COURSE (NAME OF PAPER)	Advanced Java

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit -1:-JDBC Introducing JDBC, Describing Components of JDBC, Features of JDBC, JDBC Architecture, Types of Drivers, Advantages and disadvantages of Drivers, Use of Drivers, JDBC Statement and Methods -Statement, PreparedStatement, CallableStatement, execute(), executeQuery(), executeUpdate(), Working with ResultSet interface, Working with ResultSet and MetaData.	To understand database connectivity using JDBC	Use database connectivity using JDBC
Unit -2:-Servlet Introducing CGI, Introducing Servlet, Advantages of Servlet over CGI, Features of Servlet, Introducing Servlet API, javax.servlet package, javax.servlet.http package, Introducing Servlet, Advantages of Servlet over CGI, Features of Servlet, Servlet life Cycle, init(), Service(), Destroy(), Working with GenericServlet and HttpServlet, RequestDispatcher interface, include() and forward(), Use of requestDispatcher, Session in Servlet, Interpolating session, Session tracking mechanism, Cookies, Advantages & disadvantages, use of cookies, Hidden form field, Advantages & disadvantages, use of Hidden form field, URL rewriting, disadvantages, use of URL rewriting, HttpSession, Advantages & disadvantages, use of URL rewriting.	To learn how to develop web applications using servlet	Develop web applications using servlet.
Unit -3:- JSP Introduction to JSP, Advantages of JSP over Servlet, JSP architecture, JSP life cycle, Implicit objects in JSP- request, response, out, page, pageContext, application, session, config, exception, JSP tag elements- Declarative, Declaration, scriptlet, expression, action, Java Bean, Advantages & disadvantages, usebean tag, setProperty and getProperty, Bean in Jsp, JSTL, core tag, formatting tag, conditional tag,	How to develop web applications using JSP.	Develop web applications using JSP.

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Networking tag, JSTL SQL tags, Custom tag, empty tag, body content tag, iteration tag, simple tag		
Unit -4:- Hibernate and Struts Introduction Hibernate(HB), Architecture of HB, Generator classes, Steps to create application of HB:- HB with annotation, Insert ,Delete,update,retrive records from database in HB, HB web application **Struts:-** Introduction to struts, What is struts, Use of struts, Features of Struts, Architecture of struts, Steps to create application of struts HDLC, Point to Point protocol,Multiple Access Protocol: ALOHA, CSMA, CSMA/CD,CSMA/CA Channelization, FDMA, TDMA, CDMA	To Understand concept of hibernate and struts.	To use the concept of hibernate and struts.

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COURSE OUTCOME

Name of Department: COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc
NAME OF SUBJECT	Advance Python
SEM I / II / III / IV / V / VI	Sem VI
COURSE NUMBER (PAPER NUMBER)	Paper XVII
TITLE OF COURSE (NAME OF PAPER)	Advance Python

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit - I:- Windows Applications using Thinter GUI Programming GUI in Python, Advantages of GUI, Introduction to GUI library, Basic Operations using Tkinter, Root Window, Working with Containers: Frame, Canvas Layout Management, Events and Bindings, Font, Colors, drawing on Canvas (line, oval, rectangle, etc.) Widgets: Label, Button, Checkbutton, Entry, Listbox, Message, Radiobutton, Text, Spinbox, Scrollbar, Menu etc. Writing Python Programs for GUI applications	Windows application development in python using Tkinter	Develop windows application in python using Tkinter library
Unit - II:- Database Connectivity using MySQL Installation of MySQL Database Software, Installing MySQL Connector, Steps for Database Connectivity, Working with MySQL Database : Inserting, Retrieving, Deleting and Updating the data Working with Stored Procedure	MySql open source database	Basic and advance concept of MySql open source database
Unit - III:- Web Application using Django What Is a Web Framework? The MVC Design Pattern, Django's History, Advantages of Django, Understanding Django environment, Installing Django, Setting Up a Database Django Architecture, The Development Server, Django Commands Overview, Starting a Project, Django apps, Difference between app and project, The Project Structure, Setting Up Your Project,Create an Application Migrations, Admin Panel, Views in Django, URL Routing, Template in Django, Models in Django, Forms in Django.	Web application development using Django framework.	Develop web application and web project using Django framework.
Unit - IV - XML and Networking Introduction to XML, XML Parser Architecture and API's, Parsing XML with SAX API's, Parsing XML with DOM API's **Network Programming:-** Introduction to Sockets Programming, Server Socket Methods, Client Socket Methods, IP Address, URL, TCP/IP Server, TCP/IP Client, Sending E-mail application	Concept of XML in python and network programming in Python	Understand Concept of XML in python and network programming in Python

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COURSE OUTCOME

Name of Department: COMPUTER SCIENCE

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.
NAME OF SUBJECT	Software Testing
SEM I / II / III / IV / V / VI	Sem: VI
COURSE NUMBER (PAPER NUMBER)	Paper XVIII
TITLE OF COURSE (NAME OF PAPER) Advance Python	

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit 1: Introduction To Software Testing: What is Software Testing?, Use or need of Software testing, Software Development Life Cycle (SDLC) – Water Fall Model, Spiral Model, V-Model, Prototype Model, Hybrid Model	Basic software debugging methods.	Investigate the major bugs and analyze the principles in software testing to prevent and remove bugs.
Unit- 2 White Box and Black Box Testing: Introduction to White box testing, Advantages and Disadvantages of White box testing, Loop Testing, Path Testing, Condition testing, Memory Testing, Performance Testing **Black Box Testing:** Introduction to Black box testing, Advantages and Disadvantages of Black box testing, Functional Testing- Integration Testing (Incremental Integration Testing), Top Down Incremental Integration Testing, Bottom Up Incremental Integration Testing, Non Incremental Integration Testing, System Testing, Acceptance Testing, Smoke Testing, Exploratory Testing, Ad hoc Testing, Performance Testing – Load Testing, Stress Testing, Volume Testing, Soak Testing, Regression Testing-Unit Regression Testing/Retest, Regional Regression Testing, Full Regression Testing	White box testing methods and techniques. Black Box testing methods and techniques.	Implement optimal bug prevention for quality improvement Design test planning.
Unit- 3 Test cases and its design Techniques: Introduction to Test Case, Characteristics Of Good Test Case, Test Case Template, How To Write A Test Case, How To Ensure The Test Coverage Is Good, How To Identify whether It Is	Designing test plans	Manage the test process

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is GoodTest Case Or Not, Review Process/Peer Review , Preparing Review Report, Examples On WritingTest Cases, Test Cases DesignTechniques-Error Guessing, Equivalence Partitioning, Boundary Value Analysis		
Unit - 4 Software Test Life cycle and Defect Life Cycle: Software Test Life Cycle-Writing Test Plan, Preparing Traceability Matrix, Writing Test Execution Report, Summary Report, Retrospect Meeting /Triage Meetings, Defect Life Cycle-Concept of Defect life cycle, Difference between Bug, Defect, Failure, Error	Different testing tools Familiar with open source tools	Get practical knowledge of a variety of ways to test software and an understanding of some of the modern software testing techniques

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Date-27/1/2021
Co-Curricular Unit-MDC

Head of the Department
Computer Science

PRINCIPAL
Hemaji Chandole College
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Signature of Lecturer | Signature of HOD | PRINCIPAL