



MAHATMA GANDHI COLLEGE
THIRUVANANTHAPURAM
POST GRADUATE DEPARTMENT OF CHEMISTRY & RESEARCH
CENTER

NOTICE

ADD-ON COURSE –MOLECULAR SPECTROSCOPY

Department of chemistry is conducting an Add-On course titled "MOLECULAR SPECTROSCOPY" for the academic year 2019-2020. This course aims to provide students with an in-depth understanding of spectroscopic techniques and their practical applications.

Course Duration: 30 hour

Last Date for Registration: 5/06/19

For any queries or additional information, please contact the course coordinator, Head, Department of Chemistry.

Head, Department of Chemistry

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Molecular spectroscopy

Unit I Introduction

8h

General features of absorption - Beer-Lambert's law and its limitations, transmittance, Absorbance, and molar absorptivity. Single and double beam spectrophotometers. Electronic spectroscopy: Interaction of electromagnetic radiation with molecules and types of molecular spectra. Energy levels of molecular orbitals (σ , π , n). Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromophore and auxochrome.

UNIT-II Infra red spectroscopy

8h

Different Regions in Infrared radiations. Modes of vibrations in diatomic and polyatomic molecules. Characteristic absorption bands of various functional groups. Interpretation of spectra-Alkanes, Aromatic, Alcohols, carbonyls, and amines with one example to each.

UNIT-III Proton magnetic resonance spectroscopy

8h

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

UNIT-IV

6h

Instrument demonstration

UV-Visible spectroscopy, IR spectroscopy, Photoluminescence Spectrometer (PL)

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Course Outcome

- Predict which organic compounds should exhibit visible color based upon extent of conjugation.
- Explain the origin of infrared absorptions in terms of vibrational modes of covalent bonds.
- Predict direction of chemical shifts caused by various structural shielding or deshielding effects.
- Explain the principle and instrumentation of electronic spectroscopy, Infrared spectroscopy, NMR spectroscopy and analyze the spectra of different species.

Academic Year 2019-2020		
Batch 1		
Sl.No	Name	Candidate Code
1	Adarsh Ashok	235118638198
2	Ahalya Vijayan	235118688568
3	Akshay V.R	235118612113
4	Alisha B Anil	235118671897
5	Amaljith J.S	235118671768
6	Anjana S	235118681490
7	Avanthika A.S	235118681490
8	Goutham T.S	235118693503
9	Nandana S.S	235118601449
10	Nikhil Raju S	235118669449
11	Rahul J	235118672477
12	Rugma S.R	235118676549
13	Saranya S	235118615934
14	Shahana S	235118616631
15	Sivadarsh J.S	235118631275
16	Sooraj S.R	235118644530
17	Soorya S	235118654331
18	Vaishnavi Suresh	235118615298
19	Vinay Arun	235118626350
20	Abijith V	235118602232
21	Abijith A Nair	235118659208
22	Aiswarya S Nair	235118615403
23	Ajinun M.S	235118661002
24	Akhil A.S	235118661002
25	Akshay P.S	235118668942
26	Akshaya S Gopan	235118633376
27	Arya Krishna S.S	235118663466
28	Aswathy J	235118669188
29	Athira B	235118648928
30	Athira C.S	235118647524
31	Avani M.S	235118611487
32	Deethu T.D	235118626051
33	Devika J.S	235118616584
34	Gokul Dev S	235118670019
35	Gokul G.M	23511864345
36	MayaMurali M	235118678835
37	Medha Lal R	235118619113
38	Meenu Mohan	23511861099
39	Meenu V	235118650692
40	Nandana A	235118668413
41	Praseetha R	235118621594
42	Rahul Raj R	235118668983
43	Sathiwand B	235118687548
44	Sarath C	235118675483
45	Sarath S	235118609515
46	Sreelekshmy A.R	235118608536
47	Vaishnav S.S	235118650248

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P.G. L

48	Aparna S.R	235118648579
49	Athira S	235118670821
50	Nazilu Beevi R	235118670821
51	Revathy Raj R	235118644579
52	Sandra S.B	235118610199
53	Simi S.S	235118649280
54	Aparna J.S	235118680162

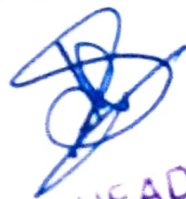


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Thiruvananthapuram

Academic Calendar 2019-2020		
Batch -11		
Sl.No	Name	Candidate Code
1	Abhirami J.S	235118313559
2	Alswarya R Sarma	235118314948
3	Anagha M.G	235118355525
4	Anagha B	235118364830
5	Aparna S	235118337940
6	Arya B.L	235118329459
7	Athira K	235118314363
8	Bharath B.S	235118323962
9	Bijasha B.K	235118329803
10	Deepika D Nair	235118363199
11	Deepika J	235118324472
12	Fouziya Beegam	235118318356
13	Gokul J.M	235118366830
14	Harisankar S.S	235118350766
15	Jyothish C.S	235118316929
16	Jyothish R.R	235118327236
17	Kiran Krishna C	235118327243
18	Malavika B	235118313457
19	Meenakshi S	235118330313
20	Poojalekshmi G.S	235118347742
21	Prasteena Suresh	235118342297
22	Preethy Prasad S	235118376816
23	Reshma R.S	235118366620
24	Rupa Suresh	235118325614
25	Sangeeth Sivan	235118367210
26	Soorya Sambu	235118302657
27	Sarath J.S	235118315804
28	Savya M.S	235118388901
29	Sivan M.S	235118360443
30	Soja Vinod	235118376971
31	Sruthy B Nair	235118304784
32	Sujith S	235118360574
33	Vineetha B.S	235118379203
34	Vishnu A.P	235118312054
35	Vishnu priya S.S	235118314512
36	Akhil S	235118351794
37	Akshara S.S	235118358093
38	Amritha V.S	235118347458
39	Anagha P.S	235118359088
40	Anjitha L	23511854295
41	Aparna P.S	235118348092
42	Arathy M.L	235118344187
43	Arya B.S	235118306450
44	Bhadra V.S	235118336619
45	Farzana Mohammed	235118311288
46	Gangadevi	235118318230
47	Gayathry E	235118344400


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	Manu M.L	235118374166
48	Reshma Vijayan	235118353516
49	Sanjay J.S	235118375154
50	Sarath Vijay S	235118364250
51	Saheerkhan	235118316590
52	Gayathry B	235118374541
53	Reshma B	235118352732
54	Abhilash A.S	235118340752
55		



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Add on Course Examination
Molecular Spectroscopy
MCQ
Answer all the questions

Marks: 10

Time: 15 minutes

1. Absorption of radiation in the UV range attributable to $n \rightarrow \pi^*$ electronic transitions is characteristic of which of the following types of compounds?

- a) Aromatic hydrocarbons.
- b) Unsaturated carbonyl compounds.
- c) Non-conjugated polyenes.
- d) Conjugated polyenes.

2. Which is the correct order of increasing wave number of the stretching vibrations of (1) C-H (alkane), (2) C-H (alkene), (3) C-H (alkyne), and (4) C-H (arene)?

- a) $(1) < (2) \approx (3) < (4)$
- b) $(4) < (3) \approx (2) < (1)$
- c) $(3) < (4) \approx (2) < (1)$
- d) $(1) < (4) \approx (2) < (3)$

3. Which of the following statements in the context of ^1H NMR spectroscopy is true?

- a) Arene C-H chemical shift (δ) values are greater than simple alkenes C-H chemical shift values because of the aromatic ring current.
- b) Arene C-H chemical shift (δ) values are smaller than simple alkenes C-H chemical shift values because of the aromatic ring current.
- c) Arene C-H signals are always multiplets.
- d) Arene C-H signals are always singlets.

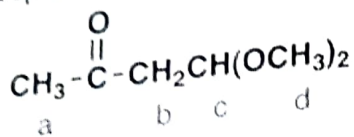
4. Which of the following statements is wrong?

- a) UV absorption is attributable to electronic transitions.
- b) UV spectra provide information about valence electrons.
- c) IR absorption is attributable to transitions between rotational energy levels of whole molecules.
- d) NMR spectrometers use radiofrequency electromagnetic radiation.

5. Which is the correct order of increasing wave number of the stretching vibrations of (1) C-H (alkane), (2) O-H (alcohol), (3) C=O (ketone), and (4) C \equiv C (alkyne)?

- a) $(4) < (3) < (2) < (1)$

- b) (3) < (4) < (2) < (1)
 c) (3) < (4) < (1) < (2)
 d) (4) < (3) < (1) < (2)
6. How many signals does the aldehyde $(\text{CH}_3)_3\text{CCH}_2\text{CHO}$ have in ^1H NMR spectra?
- a) five ^1H signals and six ^{13}C signals
 b) three ^1H signals and four ^{13}C signals
 c) five ^1H signals and four ^{13}C signals
 d) three ^1H signals and six ^{13}C signals
7. Which of hydrogens a-d in the following molecule gives a triplet signal in a normal ^1H NMR spectrum?



- a) hydrogen a
 b) hydrogen b
 c) hydrogen c
 d) hydrogen d
8. Which hydrogen of 1-chloropent-2-ene shows the largest chemical (downfield) shift in its NMR spectrum?
- a) the H on C1
 b) the H on either C2 or C3
 c) the H on C4
 d) the H on C5
9. Which carbon of (a)-(d) of hex-3-en-2-one shows the largest (most downfield) chemical shift in the NMR spectrum?
- a) C1
 b) C2
 c) C4
 d) C6
10. Which of the following statements regarding IR spectroscopy is wrong?
- a) Infrared radiation is higher in energy than UV radiation.
 b) Infrared spectra record the transmission of IR radiation.
 c) Molecular vibrations are due to periodic motions of atoms in molecules, and include bond stretching, torsional changes, and bond angle changes.

d) Infrared spectra give information about bonding features and functional groups in molecules.



Dr. A. S. S. S. S.
H.O. Dept. of Chemistry & Research Centre
Manalva Gandhi College
Chiruvannanapuram

2019 - 2020 Batch-I

	Name		Marks
1	Adarsh Ashok	235118638198	10
2	Ahalya Vijayan	235118688566	8
3	Akshay V.R.	235118682113	7
4	Alisha B. Anil	235118671897	8
5	Amaljith J.S.	235118671768	9
6	Anjana S.	235118681490	9
7	Avanthika A.S.	235118681490	10
8	Govtham T.S.	235118693503	10
9	Nandana S.S.	235118601449	8
10	Nikhil Raju S.	235118669949	9
11	Rahul J	235118672477	7
12	Rugma S.R.	235118676579	8
13	Saranya S.	235118615934	8
14	Shahana S.	235118616631	9
15	Sivadaash J.S.	235118631275	10
16	Sooraj S.R.	235118644530	10
17	Soorya S.	235118697331	10
18	Varshnavi Suresh	235118615298	9
19	Vinay Adun	235118626350	9
20	Abijith V.	235118602232	9
21	Abijith A. Naid	235118659208	8
22	Arsukhya S. Nair	235118615403	7
23	Ajina M.S.	235118661002	10
24	Akhil K.S.	235118661002	10
25	Akshay P.S.	235118668942	9
26	Akshaya S. Gopan	235118633376	9
27	Arya Krishna S.S.	235118663466	9
28	Aswathy J	235118669188	8
29	Athira B	235118624828	7
30	Athira C.S.	235118647524	8
31	Avani M.S.	235118611487	9
32	Deethu T.D.	235118626051	8
33	Devika J.S.	235118618584	8

34	Gokul Rev S	235118670019	7
35	Gokul G.M	23511864345	8
36	Maya Murali M	235118678835	8
37	Medha Lal R	235118619113	9
38	Meenu Mohan	23511861099	9
39	Meenu V	235118650692	8
40	Nandana A	23518668413	10
41	Praseetha R	235118621594	10
42	Rahul Ray R	235118668983	9
43	Sarath S.B	235118687548	9
44	Sarath C	235118675483	7
45	Sarath S.	235118609515	9
46	Sreelekshmi A.R	235118608536	10
47	Vaishnav S.S	235118650248	10
48	Aparna S.R	235118618579	8
49	Athira S.	235118670821	8
50	Azizul Bevi R	235118670821 9	8
51	Revathy Ray R.	235118644579	9
52	Sandra S.B	235118610199	10
53	Simi S.S	235118649280	10
54	Aparna J.S.	235118680162	10




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Batch - II

1.	Abhirami J.S	235118313559	10
2.	Aiswarya R Sarma.	235118314948	9
3.	Anagha M.G.	235118355525	7
4.	Anagha B	235118364830	8
5.	Aparna S.	235118337940	9
6.	Anya B.L	235118329459	10
7.	Akhira K.	23511834363	7
8.	Bharath B.S	235118323962	6
9.	Bijusha B.K.	235118329803	10
10.	Deepika Dnait	235118363199	8
11.	Deepika J	235118324472	7
12.	Fauziya Begum	235118318356	9
13.	Gokul J.M	235118366830	7
14.	Harisankar S.S	235118350766	6
15.	Jyothish C.S	235118316929	6
16.	Jyothish R.R	235118327236	6
17.	Kiran Krishna C	235118327284	7
18.	Malavika B.	235118313457	10
19.	Meenalakshis.	235118330813	10
20.	Pooja Lakshmi G.S	235118347742	10
21.	Prasanna Suresh.	235118342297	10
22.	Preethy Prasad.S	235118376816	10
23.	Rushma R.S	235118366620	9
24.	Rupa Suresh	235118325614	10
25.	Sangeeth Sivan	235118367210	10
26.	Soorya Sambu	235118302657	9
27.	Sarath T.S	235118315804	8
28.	Savya M.S	235118388901	8
29.	Sivan M.S	235118360443	6
30.	Soya Vinod	235118376971	10
31.	Streehy B.nait	235118304784	9

32.	Sujith S.	235118360574	7
33.	Vineetha B.S	235118379203	7
34.	Vishnu A.P.	235118312054	7
35.	Vishnu priya S.S	235118214512	8
36.	Akhil.S	23511835194	8
37.	Akshana S.S	235118358093	8
38.	Amsitha V.S	235118347458	10
39.	Anagha P.S	235118359088	10
40.	Anjitha L.	235118354295	9
41.	Aparna P.S	235118348092	9
42.	Anathy H.L	235118344187	9
43.	Arya B.S	235118306450	9
44.	Bhadra V.S	235118336619	10
45.	Farsana Mohammed	235118311288	10
46.	Gangadevi	235118318230	10
47.	Gayathri E	235118344400	10
48.	Manu M.L	235118374166	7
49.	Preshma Vijaya	235118353516	10
50.	Sanjay S.S	235118375754	7
51.	Sarath vijay.S	235118364250	7
52.	Sabeer Khan.	235118316590	6
53.	Gayathri B	235118374541	8
54.	Rushma B.	235118352732	9
55.	Abhilash A.S	235118340752	7


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 P.G. Dept. of Chemistry & Research Centre
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 Philuvanthanilam

ATTENDANCE REGISTER FOR THE MONTH OF 20

Sl. No.	Name	25/11	26/11	27/11	28/11	29/11	30/11	01/12	02/12	03/12	04/12	05/12	06/12	07/12	08/12	09/12	10/12	11/12	12/12	13/12	14/12	15/12	16/12	17/12	18/12	19/12	20/12	21/12	22/12	23/12	24/12	25/12	26/12	27/12	28/12	29/12	30/12	31/12	Working Days	Days present	Days absent	Leave taken	Remarks			
35	Grobel GM	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	97.1	97.1	0	0	0		
36	Maya Kusati M	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	99.1	99.1	0	0	0	
31	Mehalal E	25/11/2024	X	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.1	98.1	1	1	Med	
38	Meenu Nohon	25/11/2024	X	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	96.5	96.5	2	2	Med	
39	Meenu V	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.5	98.5	0	0	0	
40	Nandana A	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.5	98.5	0	0	0	
41	Praseetha E	25/11/2024	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.5	98.5	1	1	Med	
42	Rahul Raj E	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.5	98.5	0	0	0	
43	Santhuana SB	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.5	98.5	0	0	0	
44	Sarath C	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	96.1	96.1	3	3	Med	
45	Sarath S	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.5	98.5	0	0	0	
46	Sae Lakshmi AE	25/11/2024	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	99	99	0	0	0	
47	Varshana S.S	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	97.1	97.1	1	1	Med	
48	Aparna SE	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.1	98.1	0	0	0	
49	Athira S	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.1	98.1	0	0	0		
50	Nazila Bevi R	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.1	98.1	0	0	0	
51	Revathy Raj PS	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.1	98.1	0	0	0	
52	Sandya SE	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.1	98.1	0	0	0	
53	Simi SS	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.1	98.1	0	0	0	
54	Aparna J.S	25/11/2024	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.1	98.1	0	0	0

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ATTENDANCE REGISTER FOR THE MONTH OF 20

Sl. No.	Name	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Working Days present	Days absent	Leave taken	Remarks	
37	Vishnu praja SS	23711831512	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98.5:1	Nil			
36	Aehl S	23711831194	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	100:1	Nil			
35	Akshat SS	23711831504	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	99:1	Nil			
34	Anantha VS	23711831755	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	99:1	Nil			
33	Aranya PS	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
32	Aranya L	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
31	Aparna PS	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
30	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
29	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
28	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
27	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
26	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
25	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
24	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
23	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
22	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
21	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
20	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
19	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
18	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
17	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
16	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
15	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
14	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
13	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
12	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
11	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
10	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
9	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
8	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
7	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
6	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			
5	Aparna ML	23711831600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	98:1	Nil			

HEAD
 Dept. of Chemistry & Research Centre
 Mahatma Gandhi College
 Tiruvananthapuram



MAHATMA GANDHI COLLEGE
DEPARTMENT OF CHEMISTRY
CERTIFICATE OF COMPLETION

This is to certify that Medha Lal R has successfully completed the Add On course entitled

“ Molecular spectroscopy”



Dr. Sikha T.S
Course coordinator



Dr. Sikha T.S
Head of the Department



31/03/2020

HEAD OF DEPARTMENT
MAHATMA GANDHI COLLEGE
TRIVANIPURAM
P.S. Mahatma Gandhi College
Trivandrum



MAHATMA GANDHI COLLEGE
DEPARTMENT OF CHEMISTRY
CERTIFICATE OF COMPLETION

This is to certify that Adarsh Asok has successfully completed the Add On course entitled

“ Molecular spectroscopy ”

Dr. Sikha T.S
Course coordinator

Dr. Sikha T.S
Head of the Department

P.G. Dept. of Chemistry & Research Centre
Mahatma Gandhi College
Mambathuram
31/03/2020

SUMMARY REPORT OF ADD-ON COURSE – MOLECULAR SPECTROSCOPY (2019-2020)

Add on course on Molecular spectroscopy was successfully completed. In the academic year 2019-2020, hundred and nine students were enrolled for the course. Classes conducted from 05/08/19 to 28/02/2020, for 30 hours. Theory and practical sessions were included in this course. as per the suggestions of the students, we concentrated in practical sessions more. A hand on training was given to the students.

After the completion of the course, students were assessed by written examination. Those who secured 60% marks and above in written examinations were honoured by certificates.



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Thiruvananthapuram