# Certificate Course: Computational Chemistry in Separation Science

**Free Certificate course for college students**

**Duration – 30 hrs. (10 weeks)**

**Reserve Your Seat Today.**

# Registration Started

**Start Your Course with Promising Future**

## Course Objectives

- To introduce the fundamental concepts of computational chemistry and its relevance to separation science.
- To provide practical skills in using computational tools and software for chemical analysis and separation processes.
- To enhance problem-solving abilities by applying computational methods to real-world separation science challenges.
- To foster a deeper understanding of the molecular interactions and mechanisms underlying separation techniques

## Course Outcomes

Upon completion of this course, students will be able to:

- Understand and explain the basic principles of computational chemistry and how they apply to separation science.
- Utilize computational chemistry software to model, simulate, and analyze chemical separations.
- Interpret computational results to make informed decisions in the design and optimization of separation processes.
- Apply computational methods to solve complex problems in separation science, including the identification and quantification of compounds

## Contact- Course Convener

**Dr. Priyadarshani. N. Deshmukh**
**Assistant Professor,**
**Department of Chemistry,**
**9881332586.**

# Department of Chemistry

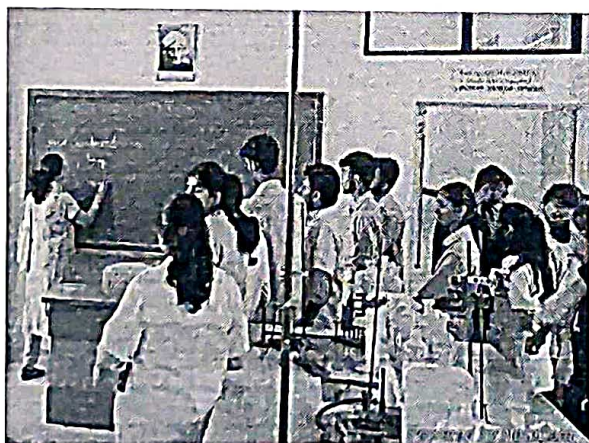## Report on skill-based Course:- Computational Chemistry in Separation Science

**Date:-27/02/2024**

Computational Chemistry in Separation Science, Add-on course run by the Department of Chemistry Shri Shivaji Science College Nagpur, the motto behind this course is to enrich students with knowledge of Computer in the field of Chemistry, especially in the separation of metal ions, organic pigmentations, etc. Students from B.Sc I, II, and III were admitted for this course. It's a 10-week duration course in which theory and practicals are taken. For practical demo was given on Software like Gaussian, AMBER, etc. and an assessment was done with the help of viva voce, the report writing, and case study preparation were very helpful for students. Theory Paper was MCQ-based, 82 students were enrolled but only 79 students appeared for theory as well as for practicals. This Course duration from 15th December 2023 to 23rd February 2024.

Course Name:- Computational Chemistry in Separation Science

Number of Students Appeared:- 82

Number of Passed Students:- 79.



Theory and Practical Class:- Add-on Course- Computational Chemistry in Separation Science

Dr.P.N.Deshmukh

To,
The Principal
SSES Amt's Science College,
Congress Nagar, Nagpur-12

Subject: For permission to conduct the add on courses in the department during the session 2023-2024

Respected Sir,

This is to request you that, the teachers of our Chemistry department have prepared the syllabus and modules of the 30 hours certificate courses for the session 2023-2024.

The details of the course module, syllabus and time table is submitted here with.

Hence please permit to run the add on courses and oblige me.

Thanking you

Yours sincerely

(Prof. R. U. Khope)

Professor & Head
Department of Chemistry,
Shri Shivaji Science College
Congress Nagar, Nagpur.

Dt
24|6|23

Permitted

**S.S.E.S. Amt's Science College, Congress Nagar, Nagpur.**

## Department of Chemistry
### Add-on (2023-2024)
### Certificate Course:- Computational Chemistry in Separation Science.

## Notice

**Date: 1/12/2023**

The Department of Chemistry is conducting an Add-on **Certificate Course on Computational Chemistry in Separation Science** for the session 2023-24. Interesting students of B.Sc. Part I, Part II & Part III should register early and contact the Course Coordinator Dr.P.N.Deshmukh immediately.

Starting date of Course:- 15/12/2023.

Dr.P.N.Deshmukh

Course Coordinator
Assistant Professor
Department of Chemistry
S.S.E.S.A.'s Science College
Nagpur

H.O.D

Department of Chemistry

Professor & Head
Department of Chemistry,
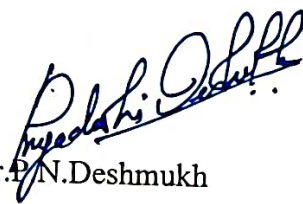Shri Shivaji Science College
Congress Nagar, Nagpur.

**Add-on certificate course (2023-2024)**

## TIME TABLE

## Certificate Course: Computational Chemistry in Separation Science

| Days | Time | |
|------|------|---|
| | Theory Classes | Practical Classes |
| Monday | - | - |
| Tuesday | - | - |
| Wednesday | - | - |
| Thursday | - | · |
| Friday | PND (C8) Theory 3.30 to 4.30 pm | PND Practical 4.35 to 5.35 pm -Chem Lab |
| Saturday | PND (C8) Theory 3.30 to 4.30 pm | - |

Dr.P.N.Deshmukh

Course Coordinator
Assistant Professor
Department of Chemistry
S.S.E.S.A.'s Science College
Nagpur

## Certificate course :-

Computational Chemistry in
Separation Science.

Starting date :- 15/12/23

to.

Closing date :- 23/02/24.

list of students enrolled

# Name of the Students.

1. Dighore Kartik Ganesh.
2. D. W. Gavhade.
3. M. K. Gaidhane
4. D. S. Karande
5. A. M. Katare
6. P. R. Khadse
7. A. P. Khaikar.
8. K. G. Satare
9. P. S. Singh.
10. J. I. Sukhadere.
11. P. D. Tirpude
12. J. V. Wadhive
13. H. D. Mande
14. M. S. Wankhade.
15. R. B. Bahire
16. S. M. Bokade
17. R. B. Ghavhan.
18. G. S. Dale
19. A. M. Dhek.
20. S. B. Faddas.
21. S. S. Gaikwad.
22. M. S. Garjelwar.
23. A. A. Gawande
24. L. B. Ghubade
25. T. S. Gonnade
26. M. V. Raut.
27. R. S. Sharma.
28. S. A. Shaikh.

| No. | Name | Signature |
|---|---|---|
| 29 | V. S. Shukla | Shukla. |
| 30 | A. Y. Sidam | AS |
| 31 | P. C. Titarmore | Sidam |
| 32 | R. V. Pawar | Rashu |
| 33 | A. S. Rathod | Rashu. |
| 34 | A. P. Raut | Pauct |
| 35 | R. V. Singh | |
| 36 | A. G. Somkumar | Somkumar |
| 37 | S. S. Thakre | Thakre |
| 38 | A. S. Tumsare | Tumsare |
| 39 | U. S. Atlaram | Atlaram. |
| 40 | S. R. Borkar | Barkar. |
| 41 | M. S. Chapke | Chapke. |
| 42 | A. S. Choudhary. | AChoudh. |
| 43 | V. R. Chikram. | VChikram |
| 44 | P. P. Dhande | |
| 45 | T. S. Gajbhije | |
| 46 | O. V. Ghaturle | Ghaturle |
| 47 | G. M. Medaoo | Gerpal |
| 48 | A. D. Shinde | Apuu |
| 49 | M. H. Solanki | Solanki -- |
| 50 | T. J. Sorde | Teju. - |
| 51 | S. P. Suthor | Suthor. |
| 52 | E. S. Tambhuskar | Asha |
| 53 | B. O. Vikey | Vikey B. |
| 54 | A. N. Wanjari | Wanjari |
| 55 | S. D. Wankhade | WScejel. |
| 56 | D. G. Yadav. | Yadav. |

| No. | Name | Signature |
|-----|------|-----------|
| 57 | S. Y. Giradkar. | |
| 58 | T. B. Mandale | |
| 59 | M. C. Rajput. | |
| 60 | G. R. Bhise | |
| 61 | M. S. Dhehankar | |
| 62 | P. S. Dubey. | |
| 63 | H. K. Aeviwale | |
| 64 | S. S. Baghel. | |
| 65 | T. H. Baig. | |
| 66 | K. S. Barsagade | |
| 67 | L. D. Bawankule | |
| 68 | A. R. Basmole | |
| 69 | T. P. Channe | |
| 70 | P. A. Datir | |
| 71 | J. V. Deshmukh. | |
| 72 | S. N. Dhok. | |
| 73 | R. S. Ayyagari | |
| 74 | S. G. Bante. | |
| 75 | K. R. Behar | |
| 76 | C. D. Baisare | |
| 77 | S. S. Bhimte | |
| 78 | V. C. Chaudhary. | |
| 79 | I. S. Jogani | |
| 80 | S. S. Junghare | |
| 81 | U. U. Kadu. | |
| 82 | B. N. Kamdar. | |

# Certificate Course: Computational Chemistry In Separation Science

## Introduction

Computational Chemistry In Separation Science Is an Interdisciplinary certificate course designed to bridge the gap between theoretical chemistry and practical applications in separation science. This course will introduce students to the principles and techniques of computational chemistry and how they can be applied to solve problems in separation science. Through a combination of lectures, hands-on practical sessions, and case studies, students will gain a comprehensive understanding of computational methods and their application in the separation and analysis of chemical compounds.

## Course Objectives

1. To introduce the fundamental concepts of computational chemistry and its relevance to separation science.
2. To provide practical skills in using computational tools and software for chemical analysis and separation processes.
3. To enhance problem-solving abilities by applying computational methods to real-world separation science challenges.
4. To foster a deeper understanding of the molecular interactions and mechanisms underlying separation techniques.

## Course Outcomes

Upon completion of this course, students will be able to:

1. Understand and explain the basic principles of computational chemistry and how they apply to separation science.
2. Utilize computational chemistry software to model, simulate, and analyze chemical separations.
3. Interpret computational results to make informed decisions in the design and optimization of separation processes.
4. Apply computational methods to solve complex problems in separation science, including the identification and quantification of compounds

## Course Structure

### Unit 1: Fundamentals of Computational Chemistry*
- Introduction to Computational Chemistry
- Basic Theories and Models
- Quantum Chemistry Fundamentals
- Molecular Mechanics and Dynamics

### Unit 2: Computational Techniques in Separation Science
- Overview of Separation Techniques (Chromatography, Electrophoresis, etc.)
- Computational Tools for Separation Processes
- Modeling of Separation Mechanisms
- Simulation of Separation Processes

## Unit 3: Practical Applications and Case Studies
- Case Studies in Chromatography
- Computational Analysis of Electrophoresis
- Applications in Environmental and Pharmaceutical Separation
- Case Study: Separation of Complex Mixtures

## Unit 4: Advanced Topics and Emerging Trends
- Advanced Computational Methods
- Machine Learning and AI in Separation Science
- Emerging Trends and Technologies
- Future Directions in Computational Chemistry and Separation Science

## Practical Sessions (Demonstration)
- Hands-on Training with Computational Chemistry Software (e.g., Gaussian, AMBER, etc.)
- Simulation and Analysis of Separation Processes
- Data Interpretation and Report Writing
- Project Work: Solving Real-world Separation Problems

**Duration of course: Ten weeks (30 Hours)**
**The Structure of Syllabus and system of evaluation -**

| Course | Theory Papers and Practical | Total Marks | |
|---|---|---|---|
| | | Theory | Practical |
| Certificate Course in Computational Chemistry in Separation Science | Theory paper- Computational Chemistry in Separation Science <br> * Theory examination will be of MCQ pattern having 40 questions each question carries 2 equal marks. | 80 | 20 |
| | * Practical examination will be based on performance evaluation in the laboratory | 100 | |

Internal Quality Assurance Cell
(IQAC)
S. S. E. S. A. Science College
Congress Nagar, Nagpur.

Principal
S. S. E. S. Amravati's
Science College, Nagpur.

# Certificate course in
# Computational Chemistry in Separation Science
## Department of Chemistry
## Teaching Plan 2023-2024

| Week | Hour Wise Teaching Plan | Content |
|---|---|---|
| Week-1 Theory 30 Hrs | Unit I 1 | Introduction to Computational Chemistry |
| | 1 | Comparative Study of Computational Chemistry with Classical Chemistry. |
| | 1 | Basic Theories and Models |
| \Week-2 | Unit II 1 | Quantum Chemistry Fundamentals. |
| | 1 | Molecular Mechanics and Dynamics. |
| | 1 | Overview of Separation Techniques (Chromatography, Electrophoresis, etc.) |
| \Week-3, | Unit III 1 | Computational Tools for Separation Processes Modeling of Separation Mechanisms, Simulation of Separation Processes |
| | 1 | Case Studies in Chromatography. |
| | 1 | Computational Analysis of Electrophoresis. |
| Week-4 | 1 | Applications in Environmental and Pharmaceutical Separation. |
| | 1 | Case Study: Separation of Complex Mixtures |
| | 1 | Case Study: Separation of Complex Mixtures |
| Week-5 | 1 | Computational Analysis of Electrophoresis |
| | 1 | Applications in Environmental and Pharmaceutical Separation |
| | | Applications in Environmental and Pharmaceutical Separation |
| | 1 | Case Study: Separation of Complex Mixtures |
| Week-6 | 1 | Case Study: Separation of Complex Mixtures |
| | Unit III 1 | Advanced Computational Methods |
| Week-7 | 1 | Machine Learning and AI in Separation Science |
| | 1 | Machine Learning and AI in Separation Science |
| | 1 | Emerging Trends and Technologies |
| Week-8 | 1 | Emerging Trends and Technologies |

| | | 1 | Future Directions in Computational Chemistry and Separation Science |
|---|---|---|---|
| Week-9 | | 1 | Future Directions in Computational Chemistry and Separation Science |
| | Unit IV | 1 | Hands-on Training with Computational Chemistry Software (e.g., Gaussian, AMBER, etc.) |
| | | 1 | Simulation and Analysis of Separation Processes |
| Week-10 | | 1 | Data Interpretation and Report Writing |
| | | 1 | Data Interpretation and Report Writing |
| | | 1 | Project Work: Solving Real-world Separation Problems |
| | | 1 | Project Work: Solving Real-world Separation Problems |
| | | 1 | Exam For Certificate Course |

Dr. Priyadarshani N, Deshmukh
Assistant Professor
Course Coordinator
Department of Chemistry
S.S.E.S.A.'s Science College
Nagpur

# RASHTRASANT TUKADOJI MAHARAJ, NAGPUR UNIVERSITY, NAGPUR

Name of the College / Institute - Shri Shivaji Education Society Amravati's Science College, Nagpur

Name of the Course - Computational Chemistry in Separation Science

Year (Duration) - 10 Weeks

| Sr.No | Name Of the Student | 15/12/23 (T) | 15/12/23 (P) | 16/12/23 (T) | 22/12/23 (T) | 22/12/23 (P) | 23/12/23 (T) | 29/12/23 (T) | 29/12/23 (P) | 30/12/23 (T) | 5/1/24 (T) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DIGHORE KARTIK GANESH | P | P | A | P | P | P | P | P | P | P |
| 2 | GAVHADE DRUTI WAMAN | P | P | A | A | P | P | P | P | P | P |
| 3 | GAIDHANE MEGHANA KISHOR | P | P | P | P | P | P | P | P | P | P |
| 4 | KARANDE DHARINI SHYAM | P | P | P | P | P | P | P | P | A | P |
| 5 | KATARE ANJESH MUKESH | P | A | P | A | A | P | A | P | A | A |
| 6 | KHADSE PRANAY RAMESH | P | P | P | P | P | P | P | P | P | P |
| 7 | KHAIRKAR ANIMESH PAWAN | A | A | A | P | A | P | A | A | P | P |
| 8 | SATARE KALYANI GAJANAN | P | P | P | P | P | P | A | P | A | A |
| 9 | SINGH PRIYA KUMARI SANTOSH | A | A | A | P | P | A | P | A | A | P |
| 10 | SUKHADEVE JIYA ISHWAR | P | P | P | A | A | P | P | P | P | A |
| 11 | TIRPUDE PRASHIK DEWANAND | P | P | P | A | A | P | P | P | P | P |
| 12 | WADHIVE JANHAVI VASANTA | P | P | P | A | A | P | A | A | P | A |
| 13 | WANDHE HIMANSHU DINESH | A | A | A | A | A | P | P | P | A | A |
| 14 | WANKHADE MRUNAL SUNIL | P | P | P | P | P | P | P | P | P | P |
| 15 | BAHIRA RANI BASANT | P | P | P | P | P | A | P | P | P | P |
| 16 | BOKADE SANIKA MANOJ | P | P | P | P | P | P | P | P | P | P |
| 17 | CHAVHAN RAKHI BHARAT | P | A | A | P | P | P | P | P | A | A |
| 18 | DATE GAURI SUNIL | P | P | P | P | P | P | P | P | P | P |
| 19 | DHEK AISHWARYA MADAN | A | A | A | A | P | P | P | P | A | A |
| 20 | FADDAS SAJANI BAPURAV | A | A | A | A | A | P | P | P | A | A |
| 21 | GAIKWAD SNEHA SAMBHAJI | P | P | P | P | P | P | P | A | A | A |
| 22 | GARJELWAR MANSI SURENDRA | P | P | P | A | A | P | P | P | A | P |
| 23 | GAWANDE AYUSHRI ANIL | A | A | A | A | A | P | P | P | P | P |
| 24 | GHUBADE LEYNESHA SANJAY | A | A | P | P | P | P | P | P | P | A |
| 25 | GONNADE TILAK SANTOSH | P | P | P | P | P | P | P | P | P | P |

| No | Name | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | RAUT MOHINI VINOD | A | A | A | P | P | P | P | P | P | P |
| 27 | SHARMA RASHI SANDEEP | P | P | P | P | A | P | P | P | P | P |
| 28 | SHEIKH SHAHINA AKIL | P | P | P | P | A | P | P | P | P | A |
| 29 | SHUKLA VAISHNAVI SANJAY | P | P | P | A | P | P | P | P | P | P |
| 30 | SIDAM ASHWINI YUVRAJ | P | P | P | A | A | P | P | P | A | A |
| 31 | TITARMARE PRANAV CHANDRAKANT | P | P | A | P | A | P | P | P | P | P |
| 32 | PAWAR RADHA VINOD | P | P | P | P | P | P | P | P | P | P |
| 33 | RATHOD ADITI SANJAY | A | A | A | P | P | A | A | P | P | P |
| 34 | RAUT ANUSHKA PRAMOD | P | P | P | A | A | P | P | P | A | P |
| 35 | SINGH RIYA VIRENDRA KUMAR | P | P | P | P | P | P | A | P | P | P |
| 36 | SOMKUWAR AVANTIKA GHANSHYAM | P | P | A | P | A | A | A | P | P | A |
| 37 | THAKRE SAKSHI SUDHIR | P | P | P | P | A | P | P | P | P | P |
| 38 | TUMSARE ANKITA SURYABHAN | P | P | A | P | P | P | P | P | P | P |
| 39 | ATRAM UNNATI SHASHIKANT | P | P | P | P | P | P | A | P | P | P |
| 40 | BORKAR SEJAL RAJESH | P | P | P | P | P | P | P | P | P | P |
| 41 | CHAPKE MOHINI SHANKAR | A | A | A | P | P | P | A | P | P | A |
| 42 | CHAUDHARY AYUSH SHRICHAND | P | P | P | P | P | P | P | A | P | P |
| 43 | CHIKRAM VAIDAVI ARVIND | P | P | A | P | P | P | P | P | P | P |
| 44 | DHANDE PRABUDHA PRADIP | P | P | P | P | P | P | P | P | A | P |
| 45 | GAJBHIYE TANISHA VISHWAJIT | P | P | P | A | A | P | P | P | A | A |
| 46 | GHATURLE GRISHMA VINOD | P | A | A | P | P | P | A | P | P | A |
| 47 | HEDAOO GAYATRI MANOJ | P | A | A | P | P | P | P | P | P | P |
| 48 | SHINDE AMIT DEEPAKRAO | P | P | A | A | P | P | A | P | A | P |
| 49 | SOLANKI MOHAK HITESH | P | P | P | P | P | P | A | P | P | P |
| 50 | SORDE TANSHREE JAGDISH | P | P | P | P | P | P | P | P | A | P |
| 51 | SUTHAR SANGITA PUKHRAJ | P | P | P | P | A | P | P | P | P | P |
| 52 | TAMBUSKAR EKTA SANJAY | P | P | A | P | A | A | P | P | P | P |
| 53 | UIKEY BHUVNESHWARI UMESH | A | A | A | P | P | P | P | P | P | A |
| 54 | WANJARI APEKSHA NAGSEN | A | A | A | A | A | P | A | P | A | A |
| 55 | WANKHEDE SHREYA DNYANESHWAR | P | P | P | A | P | P | P | P | A | A |
| 56 | YADAV DIPESH GYANESHWAR | P | P | P | P | P | P | P | P | P | P |
| 57 | GIRADKAR SWASTIK YASHWANT | P | P | P | P | P | P | P | P | P | P |
| 58 | MANDALE TANVI BABAN | P | P | P | P | P | P | P | P | P | P |

| # | Name | | | | | | | | | | |
|---|------|---|---|---|---|---|---|---|---|---|---|
| 59 | RAJPUT MADHURA CHANDRASHEKHAR | A | A | A | P | P | | | | | |
| 60 | BHISE GAYATRI RAVI | P | P | P | P | P | P | P | P | A | P |
| 61 | DEHANKAR MANISHA SHASHIKANT | P | P | P | P | P | P | P | P | P | P |
| 62 | DUBEY POONAM SUSHIL | P | P | A | P | P | P | P | P | A | A |
| 63 | ARVIWALA HUZEFA KHUZEMA | P | P | P | P | P | P | A | A | A | P |
| 64 | BAGHEL SONAM SANTOSHKUMAR | P | P | P | P | A | P | P | P | P | A |
| 65 | BAIG TASMIYA HAMID | P | P | P | P | P | P | P | P | P | P |
| 66 | BARSAGADE KALASH SUDHAKAR | P | P | P | P | P | P | P | P | P | A |
| 67 | BAWANKULE LAXMI DEVIDAS | P | P | P | P | P | A | A | P | A | P |
| 68 | BHASMOTE ARADHANA RAJENDRA | P | P | P | P | P | P | P | P | P | P |
| 69 | CHANNE TANISHKA PRAVEEN | P | A | P | P | P | P | P | P | A | P |
| 70 | DATIR PRANJALI ANKALESH | A | A | A | P | A | P | A | P | P | P |
| 71 | DESHMUKH JANHAVI VIRENDRA | P | P | P | P | P | P | P | P | P | P |
| 72 | DHOK SOKSHAM NISHANT | P | P | P | P | P | P | A | P | P | P |
| 73 | AYYAGARI RENUKA SUDHAKAR | P | P | P | P | P | P | P | P | P | P |
| 74 | BANTE SHRADDHA GUDDU | P | P | P | P | P | P | A | A | P | P |
| 75 | BEHAR KHUSHI RAJU | P | P | P | P | P | A | A | A | P | P |
| 76 | BHAISARE CHETANA DINESH | P | P | P | P | P | P | P | P | A | P |
| 77 | BHIMTE SHRIYA SURENDRAKUMAR | P | P | P | P | P | A | A | A | A | P |
| 78 | CHOUDHARY VAISHNAVI CHANDRAKANT | P | P | A | P | P | P | P | P | P | P |
| 79 | JOGANI ISHA SURAJ | P | P | P | P | P | P | P | P | P | P |
| 80 | JUNGHARE SANCHIT SHESHRAO | P | P | P | P | P | P | P | P | P | P |
| 81 | KADU UNNATI UMESH | P | P | P | A | P | P | P | P | A | P |
| 82 | KAMDAR SURBHI NARESH | P | P | P | A | P | P | P | P | P | P |

# RASHTRASANT TUKADOJI MAHARAJ, NAGPUR UNIVERSITY, NAGPUR

Name of the College / Institute - **Shri Shivaji Education Society Amravati's Science College, Nagpur**

Name of the Course - **Computational Chemistry in Separation Science**

Year (Duration) - **10 Weeks**

| Sr.No | Name Of the Student | 5/11/24 (P) | 6/11/24 (T) | 12/11/24 (T) | 13/11/24 (P) | 13/11/24 (T) | 19/11/24 (P) | 19/11/24 (T) | 20/11/24 (T) | 26/11/24 (T) | 24/2/24 (T) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DIGHORE KARTIK GANESH | P | P | P | P | P | P | P | P | P | P |
| 2 | GAVHADE DRUTI WAMAN | P | P | P | P | P | P | P | P | P | P |
| 3 | GAIDHANE MEGHANA KISHOR | P | P | P | P | P | A | P | A | P | A |
| 4 | KARANDE DHARINI SHYAM | P | P | P | P | P | P | A | P | A | P |
| 5 | KATARE ANJESH MUKESH | P | P | A | A | P | P | A | P | P | P |
| 6 | KHADSE PRANAY RAMESH | P | P | A | P | P | P | P | P | P | A |
| 7 | KHAIRKAR ANIMESH PAWAN | P | P | A | A | P | A | A | A | P | P |
| 8 | SATARE KALYANI GAJANAN | A | A | A | A | P | A | P | A | P | P |
| 9 | SINGH PRIYA KUMARI SANTOSH | A | P | P | P | P | P | P | P | P | P |
| 10 | SUKHADEVE JIYA ISHWAR | A | A | P | P | P | A | A | P | P | A |
| 11 | TIRPUDE PRASHIK DEWANAND | P | P | P | P | P | P | P | P | P | P |
| 12 | WADHIVE JANHAVI VASANTA | A | P | A | A | P | P | A | A | P | A |
| 13 | WANDHE HIMANSHU DINESH | P | P | P | P | P | P | P | P | P | P |
| 14 | WANKHADE MRUNAL SUNIL | P | P | A | P | P | A | A | A | P | P |
| 15 | BAHIRA RANI BASANT | A | P | A | P | P | P | P | A | A | A |
| 16 | BOKADE SANIKA MANOJ | A | P | P | P | P | P | P | P | P | P |
| 17 | CHAVHAN RAKHI BHARAT | A | P | P | P | P | P | P | A | P | A |
| 18 | DATE GAURI SUNIL | P | P | P | P | P | P | P | P | P | P |
| 19 | DHEK AISHWARYA MADAN | P | P | P | P | P | P | P | A | P | A |
| 20 | FADDAS SAJANI BAPURAV | A | P | P | P | P | P | A | A | P | A |
| 21 | GAIKWAD SNEHA SAMBHAJI | A | P | P | P | P | A | A | P | P | A |
| 22 | GARJELWAR MANSI SURENDRA | P | P | P | P | P | A | A | A | P | P |
| 23 | GAWANDE AYUSHRI ANIL | P | P | A | P | A | A | A | A | A | A |
| 24 | GHUBADE LEYNESHA SANJAY | A | P | P | A | P | P | P | P | P | P |
| 25 | GONNADE TILAK SANTOSH | P | P | P | P | P | P | P | P | A | P |

| No. | Name | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | RAUT MOHINI VINOD | P | P | P | P | P | P | P | A | P | P |
| 27 | SHARMA RASHI SANDEEP | P | P | P | P | P | P | P | P | P | P |
| 28 | SHEIKH SHAHINA AKIL | P | P | P | P | P | P | P | A | P | P |
| 29 | SHUKLA VAISHNAVI SANJAY | P | P | P | P | A | P | P | P | A | P |
| 30 | SIDAM ASHWINI YUVRAJ | A | P | P | P | P | P | P | P | P | P |
| 31 | TITARMARE PRANAV CHANDRAKANT | A | A | P | P | P | A | P | A | A | P |
| 32 | PAWAR RADHA VINOD | A | P | P | P | P | P | P | A | P | P |
| 33 | RATHOD ADITI SANJAY | A | P | P | P | P | P | P | P | P | P |
| 34 | RAUT ANUSHKA PRAMOD | P | P | P | P | P | P | P | A | P | P |
| 35 | SINGH RIYA VIRENDRA KUMAR | P | A | P | P | P | A | P | P | P | P |
| 36 | SOMKUWAR AVANTIKA GHANSHYAM | P | P | P | P | P | P | P | P | P | P |
| 37 | THAKRE SAKSHI SUDHIR | P | P | P | P | P | P | P | A | P | P |
| 38 | TUMSARE ANKITA SURYABHAN | P | P | P | P | P | A | A | A | P | P |
| 39 | ATRAM UNNATI SHASHIKANT | P | P | P | P | A | A | P | A | P | P |
| 40 | BORKAR SEJAL RAJESH | P | P | A | P | P | A | P | P | P | P |
| 41 | CHAPKE MOHINI SHANKAR | P | P | P | P | P | P | P | P | A | P |
| 42 | CHAUDHARY AYUSH SHRICHAND | P | P | P | P | P | A | P | A | P | P |
| 43 | CHIKRAM VAIDAVI ARVIND | P | P | A | P | A | A | P | A | P | P |
| 44 | DHANDE PRABUDHA PRADIP | A | P | P | P | A | P | P | P | P | P |
| 45 | GAJBHIYE TANISHA VISHWAJIT | P | P | P | P | P | P | P | A | A | P |
| 46 | GHATURLE GRISHMA VINOD | P | P | P | P | P | P | P | P | P | P |
| 47 | HEDAOO GAYATRI MANOJ | P | P | P | P | P | P | P | P | P | P |
| 48 | SHINDE AMIT DEEPAKRAO | P | P | P | P | P | P | P | A | P | P |
| 49 | SOLANKI MOHAK HITESH | P | P | P | P | P | P | P | P | P | P |
| 50 | SORDE TANSHREE JAGDISH | A | A | P | P | P | P | P | P | P | P |
| 51 | SUTHAR SANGITA PUKHRAJ | P | P | P | P | A | P | P | P | P | P |
| 52 | TAMBUSKAR EKTA SANJAY | P | P | P | P | P | P | P | P | P | P |
| 53 | UIKEY BHUVNESHWARI UMESH | P | P | P | P | A | P | P | P | A | P |
| 54 | WANJARI APEKSHA NAGSEN | A | A | P | P | P | P | P | P | P | P |
| 55 | WANKHEDE SHREYA DNYANESHWAR | P | P | P | P | P | P | P | P | P | P |
| 56 | YADAV DIPESH GYANESHWAR | A | P | P | P | A | P | P | A | A | P |
| 57 | GIRADKAR SWASTIK YASHWANT | P | A | A | P | A | P | P | P | P | P |
| 58 | MANDALE TANVI BABAN | P | P | P | P | P | P | P | P | P | P |

| No. | Name |
|---|---|
| 59 | RAJPUT MADHURA CHANDRASHEKHAR |
| 60 | BHISE GAYATRI RAVI |
| 61 | DEHANKAR MANISHA SHASHIKANT |
| 62 | DUBEY POONAM SUSHIL |
| 63 | ARVIWALA HUZEFA KHUZEMA |
| 64 | BAGHEL SONAM SANTOSHKUMAR |
| 65 | BAIG TASMIYA HAMID |
| 66 | BARSAGADE KALASH SUDHAKAR |
| 67 | BAWANKULE LAXMI DEVIDAS |
| 68 | BHASMOTE ARADHANA RAJENDRA |
| 69 | CHANNE TANISHKA PRAVEEN |
| 70 | DATIR PRANJALI ANKALESH |
| 71 | DESHMUKH JANHAVI VIRENDRA |
| 72 | DHOK SOKSHAM NISHANT |
| 73 | AYYAGARI RENUKA SUDHAKAR |
| 74 | BANTE SHRADDHA GUDDU |
| 75 | BEHAR KHUSHI RAJU |
| 76 | BHAISARE CHETANA DINESH |
| 77 | BHIMTE SHRIYA SURENDRAKUMAR |
| 78 | CHOUDHARY VAISHNAVI CHANDRAKANT |
| 79 | JOGANI ISHA SURAJ |
| 80 | JUNGHARE SANCHIT SHESHRAO |
| 81 | KADU UNNATI UMESH |
| 82 | KAMDAR SURBHI NARESH |

# RASHTRASANT TUKADOJI MAHARAJ, NAGPUR UNIVERSITY, NAGPUR

Name of the College / Institute - Shri Shivaji Education Society Amravati's Science College, Nagpur

Name of the Course - Computational Chemistry in Separation Science

Year ( Duration)- 10 Weeks

| Sr.No | Name Of the Student | 2/2/24 (P) | 3/2/24 (T) | 9/2/24 (T) | 9/2/24 (P) | 10/2/24 (T) | 16/2/24 (T) | 16/2/24 (P) | 17/2/24 (T) | 23/2/24 (T) | 24/2/24 (T) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DIGHORE KARTIK GANESH | P | P | P | P | P | P | P | P | P | P |
| 2 | GAVHADE DRUTI WAMAN | P | A | P | P | P | P | P | A | P | P |
| 3 | GAIDHANE MEGHANA KISHOR | P | A | P | P | P | P | P | P | P | P |
| 4 | KARANDE DHARINI SHYAM | P | P | P | A | A | P | A | P | A | A |
| 5 | KATARE ANJESH MUKESH | A | P | P | P | P | A | A | P | P | P |
| 6 | KHADSE PRANAY RAMESH | A | P | P | P | P | A | A | P | P | P |
| 7 | KHAIRKAR ANIMESH PAWAN | A | P | A | A | A | A | A | P | A | P |
| 8 | SATARE KALYANI GAJANAN | P | P | P | A | P | A | A | P | P | P |
| 9 | SINGH PRIYA KUMARI SANTOSH | A | A | P | P | A | P | P | P | P | P |
| 10 | SUKHADEVE JIYA ISHWAR | A | A | P | A | A | A | P | P | P | A |
| 11 | TIRPUDE PRASHIK DEWANAND | P | P | A | A | A | A | P | P | P | P |
| 12 | WADHIVE JANHAVI VASANTA | P | P | P | P | P | P | P | P | P | P |
| 13 | WANDHE HIMANSHU DINESH | P | P | P | P | P | P | P | P | P | P |
| 14 | WANKHADE MRUNAL SUNIL | P | P | A | A | P | P | P | P | P | P |
| 15 | BAHIRA RANI BASANT | P | P | P | P | A | P | P | P | P | P |
| 16 | BOKADE SANIKA MANOJ | P | P | P | P | P | P | P | P | P | P |
| 17 | CHAVHAN RAKHI BHARAT | P | P | P | P | P | P | P | P | P | P |
| 18 | DATE GAURI SUNIL | P | P | P | A | P | P | P | P | P | P |
| 19 | DHEK AISHWARYA MADAN | P | P | P | P | P | P | P | P | P | P |
| 20 | FADDAS SAJANI BAPURAV | P | P | P | P | P | P | P | P | P | P |
| 21 | GAIKWAD SNEHA SAMBHAJI | P | P | A | A | P | P | P | P | P | P |
| 22 | GARJELWAR MANSI SURENDRA | P | P | P | P | P | P | P | P | P | P |
| 23 | GAWANDE AYUSHRI ANIL | P | P | P | P | P | P | P | P | P | P |
| 24 | GHUBADE LEYNESHA SANJAY | P | P | A | P | P | P | P | P | P | A |
| 25 | GONNADE TILAK SANTOSH | P | P | A | A | P | P | P | P | P | P |

| # | Name | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 26 | RAUT MOHINI VINOD | P | P | P | P | P | P | P | P | P |
| 27 | SHARMA RASHI SANDEEP | P | P | P | P | A | P | P | A | P |
| 28 | SHEIKH SHAHINA AKIL | P | P | P | P | A | P | A | A | P |
| 29 | SHUKLA VAISHNAVI SANJAY | P | P | P | P | P | P | A | A | P |
| 30 | SIDAM ASHWINI YUVRAJ | P | P | A | A | A | P | P | A | P |
| 31 | TITARMARE PRANAV CHANDRAKANT | P | P | P | P | P | P | P | P | P |
| 32 | PAIVAR RADHA VINOD | P | P | P | P | P | P | P | P | P |
| 33 | RATHOD ADITI SANJAY | A | P | A | P | A | P | A | P | A |
| 34 | RAUT ANUSHKA PRAMOD | A | A | P | P | A | P | A | P | A |
| 35 | SINGH RIYA VIRENDRA KUMAR | A | A | A | A | P | P | P | P | P |
| 36 | SOMKUWAR AVANTIKA GHANSHYAM | P | A | A | A | A | A | P | A | A |
| 37 | THAKRE SAKSHI SUDHIR | P | A | P | P | P | P | P | P | P |
| 38 | TUMSARE ANKITA SURYABHAN | P | P | P | P | P | P | P | P | P |
| 39 | ATRAM UNNATI SHASHIKANT | P | P | P | A | A | P | P | P | P |
| 40 | BORKAR SEJAL RAJESH | P | A | A | P | A | P | P | A | A |
| 41 | CHAPKE MOHINI SHANKAR | P | A | A | A | A | P | P | P | P |
| 42 | CHAUDHARY AYUSH SHRICHAND | P | P | P | A | P | P | P | P | P |
| 43 | CHIKRAM VAIDAVI ARVIND | P | P | P | P | P | P | P | P | P |
| 44 | DHANDE PRABUDHA PRADIP | P | P | P | A | P | P | P | P | P |
| 45 | GAJBHIYE TANISHA VISHWAJIT | P | A | A | A | P | P | A | A | P |
| 46 | GHATURLE GRISHMA VINOD | P | P | A | A | P | P | P | P | P |
| 47 | HEDAOO GAYATRI MANOJ | P | A | A | A | P | P | A | P | P |
| 48 | SHINDE AMIT DEEPAKRAO | P | P | P | A | P | P | P | P | P |
| 49 | SOLANKI MOHAK HITESH | A | A | A | P | P | P | P | P | P |
| 50 | SORDE TANSHREE JAGDISH | P | P | P | P | P | P | P | P | P |
| 51 | SUTHAR SANGITA PUKHRAJ | P | P | P | P | P | P | P | P | P |
| 52 | TAMBUSKAR EKTA SANJAY | P | A | P | P | P | P | P | A | P |
| 53 | UIKEY BHUVNESHWARI UMESH | P | P | P | P | P | P | P | P | P |
| 54 | WANJARI APEKSHA NAGSEN | P | P | P | P | P | P | P | P | P |
| 55 | WANKHEDE SHREYA DNYANESHWAR | P | P | P | P | P | P | P | P | P |
| 56 | YADAV DIPESH GYANESHWAR | P | P | P | P | P | P | P | P | P |
| 57 | GIRADKAR SWASTIK YASHWANT | P | P | P | P | P | P | P | P | P |
| 58 | MANDALE TANVI BABAN | A | P | P | P | P | P | P | P | P |

| No | Name | | | | | | | | | |
|----|------|---|---|---|---|---|---|---|---|---|
| 59 | RAJPUT MADHURA CHANDRASHEKHAR | P | P | P | P | P | P | P | A | P |
| 60 | BHISE GAYATRI RAVI | P | P | P | P | P | P | P | A | P |
| 61 | DEHANKAR MANISHA SHASHIKANT | A | A | P | A | A | A | A | A | A |
| 62 | DUBEY POONAM SUSHIL | P | P | P | P | P | P | P | P | P |
| 63 | ARVIWALA HUZEFA KHUZEMA | P | P | A | A | A | A | A | A | P |
| 64 | BAGHEL SONAM SANTOSHKUMAR | A | A | A | A | A | A | A | A | P |
| 65 | BAIG TASMIYA HAMID | A | A | A | A | A | A | P | P | P |
| 66 | BARSAGADE KALASH SUDHAKAR | P | P | P | P | P | P | P | P | P |
| 67 | BAWANKULE LAXMI DEVIDAS | P | P | P | P | P | P | P | P | P |
| 68 | BHASMOTE ARADHANA RAJENDRA | A | A | A | A | A | A | A | A | A |
| 69 | CHANNE TANISHKA PRAVEEN | P | P | P | P | P | A | P | A | A |
| 70 | DATIR PRANJALI ANKALESH | P | P | P | P | P | P | P | P | P |
| 71 | DESHMUKH JANHAVI VIRENDRA | P | P | A | P | A | A | A | A | A |
| 72 | DHOK SOKSHAM NISHANT | P | P | P | P | P | P | P | P | P |
| 73 | AYYAGARI RENUKA SUDHAKAR | P | P | P | P | P | P | P | P | P |
| 74 | BANTE SHRADDHA GUDDU | P | A | P | P | P | P | P | P | P |
| 75 | BEHAR KHUSHI RAJU | P | A | P | P | P | P | P | P | P |
| 76 | BHAISARE CHETANA DINESH | P | P | P | P | P | P | P | P | P |
| 77 | BHIMTE SHRIYA SURENDRAKUMAR | A | P | P | P | P | P | P | P | P |
| 78 | CHOUDHARY VAISHNAVI CHANDRAKANT | A | P | P | P | P | P | P | P | P |
| 79 | JOGANI ISHA SURAJ | P | P | A | P | P | P | P | P | P |
| 80 | JUNGHARE SANCHIT SHESHRAO | P | P | A | A | P | P | P | P | P |
| 81 | KADU UNNATI UMESH | P | P | A | A | A | P | P | P | P |
| 82 | KAMDAR SURBHI NARESH | P | P | A | A | A | P | P | A | A |

Assistant Professor
Department of Chemistry
S.S.E.S.A.'s Science College
Nagpur

Shri Shivaji Education Society Amravati's SCIENCE College, Congress Nagar, Nagpur.

# ADD-ON COURSE EXAMINATION (2023-2024)

## Certificate Course: Computational Chemistry in Separation Science.

### NOTICE

Date: 23/02/2024

All the registered students of the add-on Course on Computational Chemistry in Separation Science under the Department of Chemistry for the session 2023-24 are hereby informed that the **Theory examination** is to be scheduled on 27/02/2024 from 10:30 am to 11:30 am in the Chemistry classroom (C8) at our college center. Also, the Practical examination in Chemistry Lab A and Lab B is followed by the theory Examination All Students should be present in the Classroom and the laboratory before 10 mins of the scheduled time of examination.

Assistant Professor
Dr. P/N.Deshmukh. Department of Chemistry
Course Coordinator S.S.E.S.A.'s Science College
Department of Chemistry. Nagpur

Professor & Head
Department of Chemistry,
Shri Shivaji Science College
Congress Nagar, Nagpur.
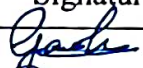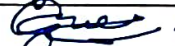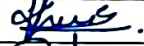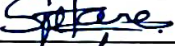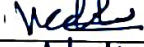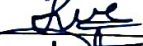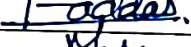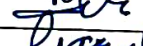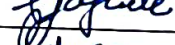
### Skill-Based Certificate course
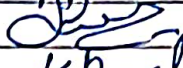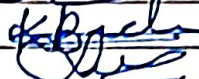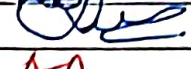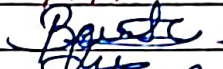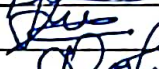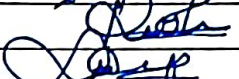
**Title: "Computational Chemistry in Separation Science."**
Attendance Sheet-2023-2024

**Course Coordinator: Dr. Priyadarshani N.Deshmukh.**

Exam date:- 27/02/2024

| Sr.No | Name of the Student | Signature |
|---|---|---|
| 1 | DIGHORE KARTIK GANESH | |
| 2 | GAVHADE DRUTI WAMAN | |
| 3 | GAIDHANE MEGHANA KISHOR | |
| 4 | KARANDE DHARINI SHYAM | |
| 5 | KATARE ANJESH MUKESH | |
| 6 | KHADSE PRANAY RAMESH | |
| 7 | KHAIRKAR ANIMESH PAWAN | |
| 8 | SATARE KALYANI GAJANAN | |
| 9 | SINGH PRIYA KUMARI SANTOSH | |
| 10 | SUKHADEVE JIYA ISHWAR | |
| 11 | TIRPUDE PRASHIK DEWANAND | |
| 12 | WADHIVE JANHAVI VASANTA | |
| 13 | WANDHE HIMANSHU DINESH | |
| 14 | WANKHADE MRUNAL SUNIL | |
| 15 | BAHIRA RANI BASANT | |
| 16 | BOKADE SANIKA MANOJ | |
| 17 | CHAVHAN RAKHI BHARAT | |
| 18 | DATE GAURI SUNIL | |
| 19 | DHEK AISHWARYA MADAN | |
| 20 | FADDAS SAJANI BAPURAV | |
| 21 | GAIKWAD SNEHA SAMBHAJI | |
| 22 | GARJELWAR MANSI SURENDRA | |
| 23 | GAWANDE AYUSHRI ANIL | |
| 24 | GHUBADE LEYNESHA SANJAY | |
| 25 | GONNADE TILAK SANTOSH | |
| 26 | RAUT MOHINI VINOD | |
| 27 | SHARMA RASHI SANDEEP | |
| 28 | SHEIKH SHAHINA AKIL | |

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| 29 | SHUKLA VAISHNAVI SANJAY | |
| 30 | SIDAM ASHWINI YUVRAJ | |
| 31 | TITARMARE PRANAV CHANDRAKANT | |
| 32 | PAWAR RADHA VINOD | |
| 33 | RATHOD ADITI SANJAY | |
| 34 | RAUT ANUSHKA PRAMOD | |
| 35 | SINGH RIYA VIRENDRA KUMAR | |
| 36 | SOMKUWAR AVANTIKA GHANSHYAM | |
| 37 | THAKRE SAKSHI SUDHIR | |
| 38 | TUMSARE ANKITA SURYABHAN | |
| 39 | ATRAM UNNATTI SHASHIKANT | |
| 40 | BORKAR SEJAL RAJESH | |
| 41 | CHAPKE MOHINI SHANKAR | |
| 42 | CHAUDHARY AYUSH SHRICHAND | |
| 43 | CHIKRAM VAIDAVI ARVIND | |
| 44 | DHANDE PRABUDHA PRADIP | |
| 45 | GAJBHIYE TANISHA VISHWAJIT | |
| 46 | GHATURLE GRISHMA VINOD | |
| 47 | HEDAOO GAYATRI MANOJ | |
| 48 | SHINDE AMIT DEEPAKRAO | |
| 49 | SOLANKI MOHAK HITESH | AA |
| 50 | SORDE TANSHREE JAGDISH | |
| 51 | SUTHAR SANGITA PUKHRAJ | |
| 52 | TAMBUSKAR EKTA SANJAY | |
| 53 | UIKEY BHUVNESHWARI UMESH | |
| 54 | WANJARI APEKSHA NAGSEN | |
| 55 | WANKHEDE SHREYA DNYANESHWAR | |
| 56 | YADAV DIPESH GYANESHWAR | |
| 57 | GIRADKAR SWASTIK YASHWANT | |
| 58 | MANDALE TANVI BABAN | |
| 59 | RAJPUT MADHURA CHANDRASHEKHAR | |
| 60 | BHISE GAYATRI RAVI | |
| 61 | DEHANKAR MANISHA SHASHIKANT | |
| 62 | DUBEY POONAM SUSHIL | |
| 63 | ARVIWALA HUZEFA KHUZEMA | AA |
| 64 | BAGHEL SONAM SANTOSHKUMAR | |
| 65 | BAIG TASMIYA HAMID | |
| 66 | BARSAGADE KALASH SUDHAKAR | |
| 67 | BAWANKULE LAXMI DEVIDAS | |
| 68 | BHASMOTE ARADHANA RAJENDRA | |
| 69 | CHANNE TANISHKA PRAVEEN | |
| 70 | DATIR PRANJALI ANKALESH | |

| 71 | DESHMUKH JANHAVI VIRENDRA | |
|----|---------------------------|---|
| 72 | DHOK SOKSHAM NISHANT | |
| 73 | AYYAGARI RENUKA SUDHAKAR | |
| 74 | BANTE SHRADDHA GUDDU | |
| 75 | BEHAR KHUSHI RAJU | |
| 76 | BHAISARE CHETANA DINESH | |
| 77 | BHIMTE SHRIYA SURENDRAKUMAR | |
| 78 | CHOUDHARY VAISHNAVI CHANDRAKANT | |
| 79 | JOGANI ISHA SURAJ | |
| 80 | JUNGHARE SANCHIT SHESHRAO | |
| 81 | KADU UNNATI UMESH | |
| 82 | KAMDAR SURBHI NARESH | |

Assistant Professor
Department of Chemistry
S.S.E.S.A.'s Science College
Nagpur

# RASHTRASANT TUKADOJI MAHARAJ, NAGPUR UNIVERSITY, NAGPUR

Name of the College / Institute - Shri Shivaji Education Society Amravati's Science College, Nagpur

Name of the Course - Computational Chemistry in Separation Science

Year ( Duration)- 10 Weeks

## Result of Skill-Based Course:- Computational Chemistry in Separation Science.

| Sr.No. | Name of the Student | Roll. No | Theory Marks | Practical Marks | Total Marks | Grade |
|--------|---------------------|----------|--------------|-----------------|-------------|-------|
| 1 | DIGHORE KARTIK GANESH | CC-1 | 80 | 19 | 99 | O |
| 2 | GAVHADE DRUTI WAMAN | CC-2 | 76 | 18 | 94 | O |
| 3 | GAIDHANE MEGHANA KISHOR | CC-3 | 76 | 20 | 96 | O |
| 4 | KARANDE DHARINI SHYAM | CC-4 | 24 | 15 | 39 | P |
| 5 | KATARE ANJESH MUKESH | CC-5 | 56 | 18 | 74 | A |
| 6 | KHADSE PRANAY RAMESH | CC-6 | 22 | 8 | 30 | P |
| 7 | KHAIRKAR ANIMESH PAWAN | CC-7 | 64 | 8 | 72 | A |
| 8 | SATARE KALYANI GAJANAN | CC-8 | 72 | 17 | 89 | A+ |
| 9 | SINGH PRIYA KUMARI SANTOSH | CC-9 | 78 | 8 | 86 | A+ |
| 10 | SUKHADEVE JIYA ISHWAR | CC-10 | 78 | 9 | 87 | A+ |
| 11 | TIRPUDE PRASHIK DEWANAND | CC-11 | 34 | 19 | 53 | B |
| 12 | WADHIVE JANHAVI VASANTA | CC-12 | 54 | 18 | 72 | A |
| 13 | WANDHE HIMANSHU DINESH | CC-13 | 62 | 15 | 77 | A |
| 14 | WANKHADE MRUNAL SUNIL | CC-14 | 44 | 12 | 56 | B |
| 15 | BAHIRA RANI BASANT | CC-15 | 52 | 8 | 60 | B |
| 16 | BOKADE SANIKA MANOJ | CC-16 | 32 | 11 | 43 | P |
| 17 | CHAVHAN RAKHI BHARAT | CC-17 | 60 | 10 | 70 | B+ |
| 18 | DATE GAURI SUNIL | CC-18 | 28 | 11 | 39 | P |
| 19 | DHEK AISHWARYA MADAN | CC-19 | 40 | 17 | 57 | B |
| 20 | FADDAS SAJANI BAPURAV | CC-20 | 52 | 19 | 71 | A |
| 21 | GAIKWAD SNEHA SAMBHAJI | CC-21 | 80 | 9 | 89 | A+ |
| 22 | GARJELWAR MANSI SURENDRA | CC-22 | 18 | 15 | 33 | P |
| 23 | GAWANDE AYUSHRI ANIL | CC-23 | 42 | 17 | 59 | B |
| 24 | GHUBADE LEYNESHA SANJAY | CC-24 | 32 | 17 | 49 | C |
| 25 | GONNADE TILAK SANTOSH | CC-25 | 18 | 14 | 32 | P |
| 26 | RAUT MOHINI VINOD | CC-26 | 60 | 20 | 80 | A |
| 27 | SHARMA RASHI SANDEEP | CC-27 | 24 | 15 | 39 | P |
| 28 | SHEIKH SHAHINA AKIL | CC-28 | 46 | 20 | 66 | B+ |
| 29 | SHUKLA VAISHNAVI SANJAY | CC-29 | 48 | 12 | 60 | B+ |
| 30 | SIDAM ASHWINI YUVRAJ | CC-30 | 34 | 17 | 51 | C |
| 31 | TITARMARE PRANAV CHANDRAKANT | CC-31 | 62 | 15 | 77 | A |
| 32 | PAWAR RADHA VINOD | CC-32 | 28 | 17 | 45 | P |
| 33 | RATHOD ADITI SANJAY | CC-33 | 46 | 18 | 64 | B+ |
| 34 | RAUT ANUSHKA PRAMOD | CC-34 | 80 | 11 | 91 | O |
| 35 | SINGH RIYA VIRENDRA KUMAR | CC-35 | 68 | 14 | 82 | A+ |

| | | | | | | |
|---|---|---|---|---|---|---|
| 36 | SOMKUWAR AVANTIKA GHANSHYAM | CC-36 | 20 | 16 | 36 | P |
| 37 | THAKRE SAKSHI SUDHIR | CC-37 | 34 | 16 | 50 | C |
| 38 | TUMSARE ANKITA SURYABHAN | CC-38 | 46 | 9 | 55 | B |
| 39 | ATRAM UNNATTI SHASHIKANT | CC-39 | 54 | 12 | 66 | B+ |
| 40 | BORKAR SEJAL RAJESH | CC-40 | 58 | 15 | 73 | A |
| 41 | CHAPKE MOHINI SHANKAR | CC-41 | 46 | 11 | 57 | B |
| 42 | CHAUDHARY AYUSH SHRICHAND | CC-42 | 46 | 16 | 62 | B+ |
| 43 | CHIKRAM VAIDAVI ARVIND | CC-43 | 74 | 17 | 91 | A+ |
| 44 | DHANDE PRABUDHA PRADIP | CC-44 | 22 | 10 | 32 | P |
| 45 | GAJBHIYE TANISHA VISHWAJIT | CC-45 | 70 | 8 | 78 | A |
| 46 | GHATURLE GRISHMA VINOD | CC-46 | 20 | 19 | 39 | P |
| 47 | HEDAOO GAYATRI MANOJ | CC-47 | 34 | 12 | 46 | C |
| 48 | SHINDE AMIT DEEPAKRAO | CC-48 | 78 | 14 | 92 | O |
| 49 | SOLANKI MOHAK HITESH | CC-49 | AA | AA | AA | AA |
| 50 | SORDE TANSHREE JAGDISH | CC-50 | 42 | 17 | 69 | B |
| 51 | SUTHAR SANGITA PUKHRAJ | CC-51 | 16 | 9 | 25 | P |
| 52 | TAMBUSKAR EKTA SANJAY | CC-52 | 24 | 11 | 36 | P |
| 53 | UIKEY BHUVNESHWARI UMESH | CC-53 | 34 | 13 | 47 | C |
| 54 | WANJARI APEKSHA NAGSEN | CC-54 | 60 | 9 | 69 | B+ |
| 55 | WANKHEDE SHREYA DNYANESHWAR | CC-55 | 46 | 16 | 62 | B+ |
| 56 | YADAV DIPESH GYANESHWAR | CC-56 | 66 | 19 | 85 | A+ |
| 57 | GIRADKAR SWASTIK YASHWANT | CC-57 | 24 | 14 | 38 | P |
| 58 | MANDALE TANVI BABAN | CC-58 | 60 | 12 | 72 | A |
| 59 | RAJPUT MADHURA CHANDRASHEKHAR | CC-59 | 78 | 14 | 92 | O |
| 60 | BHISE GAYATRI RAVI | CC-60 | 68 | 20 | 88 | A+ |
| 61 | DEHANKAR MANISHA SHASHIKANT | CC-61 | 72 | 19 | 91 | O |
| 62 | DUBEY POONAM SUSHIL | CC-62 | 34 | 15 | 49 | C |
| 63 | ARVIWALA HUZEFA KHUZEMA | CC-63 | AA | AA | AA | AA |
| 64 | BAGHEL SONAM SANTOSHKUMAR | CC-64 | 22 | 10 | 32 | P |
| 65 | BAIG TASMIYA HAMID | CC-65 | 40 | 9 | 49 | C |
| 66 | BARSAGADE KALASH SUDHAKAR | CC-66 | 48 | 14 | 62 | B+ |
| 67 | BAWANKULE LAXMI DEVIDAS | CC-67 | 32 | 20 | 52 | B |
| 68 | BHASMOTE ARADHANA RAJENDRA | CC-68 | 58 | 13 | 71 | A |
| 69 | CHANNE TANISHKA PRAVEEN | CC-69 | 48 | 14 | 62 | B+ |
| 70 | DATIR PRANJALI ANKALESH | CC-70 | 40 | 17 | 57 | B |
| 71 | DESHMUKH JANHAVI VIRENDRA | CC-71 | 22 | 17 | 39 | P |
| 72 | DHOK SOKSHAM NISHANT | CC-72 | 56 | 13 | 69 | B+ |
| 73 | AYYAGARI RENUKA SUDHAKAR | CC-73 | 78 | 11 | 89 | A+ |
| 74 | BANTE SHRADDHA GUDDU | CC-74 | 70 | 20 | 90 | O |
| 75 | BEHAR KHUSHI RAJU | CC-75 | 28 | 18 | 46 | C |
| 76 | BHAISARE CHETANA DINESH | CC-76 | 28 | 10 | 38 | P |
| 77 | BHIMTE SHRIYA SURENDRAKUMAR | CC-77 | AA | AA | AA | AA |

| | | | | | | |
|----|-----------------------------------|--------|----|----|----|-----|
| 78 | CHOUDHARY VAISHNAVI CHANDRAKANT | CC-78 | 62 | 19 | 81 | A+ |
| 79 | JOGANI ISHA SURAJ | CC-79 | 34 | 15 | 49 | C |
| 80 | JUNGHARE SANCHIT SHESHRAO | CC-80 | 34 | 19 | 53 | B |
| 81 | KADU UNNATI UMESH | CC-81 | 28 | 9 | 37 | P |
| 82 | KAMDAR SURBHI NARESH | CC-82 | 50 | 13 | 63 | B+ |

Dr.P.N.Deshmukh
**Assistant Professor**
**Department of Chemistry**
**S.S.E.S.A.'s Science College**
**Nagpur**

Answer key.

# Shri Shivaji Education Society, Amravati's
# SCIENCE COLLEGE
### Congress Nagar, Nagpur-12 (M.S.), India

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Institutional Member of APQN
Recognized Centre for Higher Learning and Research
Mentor College under 'PARAMARSH Scheme', UGC, New Delhi

## Add-on Course
**Course Exam Name: Certificate Course on Computational Chemistry in Separation Science**

**Name of Student:**

........................................................................................

**Roll No.:**      **Session: 2023-24**

**Test Date: 27/02/2024**     **Max. Marks: 40**

**Obtained Marks:**

**Invigilator Signature**

| Q | Ans | Q | Ans | Q | Ans | Q | Ans | Q | Ans |
|---|-----|---|-----|---|-----|---|-----|---|-----|
| 1 | B | 11 | B | 21 | D | 31 | A | 41 | — |
| 2 | C | 12 | B | 22 | C | 32 | D | 42 | — |
| 3 | A | 13 | B | 23 | B | 33 | C | 43 | — |
| 4 | A | 14 | B | 24 | A | 34 | C | 44 | — |
| 5 | B | 15 | A | 25 | B | 35 | D | 45 | — |
| 6 | B | 16 | C | 26 | A | 36 | A | 46 | — |
| 7 | B | 17 | C | 27 | B | 37 | A | 47 | — |
| 8 | D | 18 | C | 28 | C | 38 | B | 48 | — |
| 9 | B | 19 | B | 29 | B | 39 | A | 49 | — |
| 10 | C | 20 | B | 30 | A | 40 | D | 50 | — |

## Add-on Course

**Course Exam Name: Certificate Course on Computational Chemistry in Separation Science**

**Name of Student:** Kartik G. Dighore

**Roll No.:** CC-1

**Session:** 2023-24

**Test Date:** 27/02/2024

**Max. Marks:** 40

**Obtained Marks:** 80

**Invigilator Signature**

**INSTRUCTIONS FOR FILLING THE SHEET**
1. This sheet should not be folded or crushed.
2. Use only blue/ black ball point pen to fill the circles.
3. Use of pencil is strictly prohibited.
4. Circles should be darkened completely and properly.
5. Cutting and erasing on this sheet is not allowed.
6. Do not use any stray marks on the sheet.
7. Do not use marker or white fluid to hide the mark.

WRONG METHODS    CORRECT METHOD

| # | A | B | C | D |
|---|---|---|---|---|
| 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 | ● |  |  |  |
| 32 |  |  |  | ● |
| 33 |  | ● | ● |  |
| 34 |  | ● | ● |  |
| 35 |  |  |  | ● |
| 36 | ● |  |  | ● |
| 37 | ● |  |  |  |
| 38 |  | ● |  |  |
| 39 | ● |  |  |  |
| 40 |  |  |  | ● |
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| 50 |  |  |  |  |

**S.S.E.S. Amt's Science College, Congress Nagar, Nagpur.**

# Department of Chemistry
Add-on  (2023-2024)
## Certificate Course:- Computational Chemistry in Separation Science.

Solve all questions. Each question carries 2 marks.      Date:-27/02/2024
Time:- 1 hr.                                                              Marks:-80 M
==================================================================

1. Which of the following is a fundamental concept of quantum chemistry?
A) Newton's Laws
B) Schrödinger Equation
C) Boyle's Law
D) Charles's Law

2. Molecular mechanics primarily uses which type of force field to model molecular interactions?
A) Electromagnetic field
B) Gravitational field
C) Classical force field
D) Quantum force field

3. In computational chemistry, the Born-Oppenheimer approximation separates which two types of motion?
A) Electronic and nuclear
B) Rotational and vibrational
C) Translational and rotational
D) Electronic and vibrational

4. Which method is commonly used to calculate the electronic structure of molecules?
A) Density Functional Theory (DFT)
B) Classical Mechanics
C) Newtonian Dynamics
D) Kinetic Theory

5. The primary purpose of molecular dynamics simulations is to study:
A) Static molecular structures
B) Molecular interactions over time
C) Quantum mechanical wave functions
D) Chemical reaction rates.

6. Which separation technique involves the use of a stationary phase and a mobile phase?
A) Electrophoresis
B) Chromatography
C) Distillation
D) Filtration

7. Computational tools for separation processes primarily aim to:
A) Simplify manual calculations
B) Model and optimize separation mechanisms
C) Replace laboratory experiments
D) Analyze reaction kinetics

8. Retention time in chromatography can be predicted using:
A) Quantum mechanical models
B) Molecular mechanics simulations
C) Empirical correlations and computational models
D) Gravitational equations

9. Electrophoresis is primarily used for the separation of:
A) Gaseous compounds
B) Large biological molecules
C) Metals
D) Crystals

10. Which computational software is widely used for quantum chemical calculations?
A) Microsoft Excel
B) Gaussian
C) MATLAB
D) SPSS

11. In a case study involving chromatography, computational models help to:
A) Design new chromatographic equipment
B) Predict retention times and optimize separation conditions
C) Analyze the legal aspects of chemical separations
D) Improve software coding for simulations

12. The separation of complex mixtures often requires:
A) Single-stage separation techniques
B) Multiple-stage or multidimensional separation techniques
C) Only manual intervention
D) Non-computational approaches

13. Computational analysis of electrophoresis data can provide insights into:
A) Electrical circuit design
B) Molecular size and charge distribution
C) Geological formations
D) Astronomical distances

14. A key application of computational chemistry in pharmaceutical separation is to:
A) Design new drugs
B) Identify and quantify active pharmaceutical ingredients
C) Conduct clinical trials
D) Market pharmaceutical products

15. Which advanced computational method is increasingly used in separation science for pattern recognition and data analysis?
A) Machine Learning
B) Traditional Statistics
C) Manual Data Entry
D) Simple Regression

16. Artificial Intelligence (AI) can enhance separation processes by
A) Performing physical separations
B) Optimizing separation conditions through predictive modeling
C) Replacing all human analysts
D) Reducing the need for quality control

17. An emerging trend in computational chemistry involves the integration of:
A) Traditional paper-based records
B) Quantum computing techniques
C) Manual chromatographic techniques
D) Classical mechanical methods

18 One of the future directions in computational chemistry for separation science is:
A) Reducing computational resources
B) Increasing the complexity of manual calculations
C) Developing more accurate and efficient computational models
D) Decreasing automation in separation processes

19. Machine learning in computational chemistry helps to:
A) Perform laboratory experiments
B) Analyze large datasets and identify patterns
C) Manually calculate molecular structures
D) Replace chemical synthesis processes

20. Hands-on training in computational chemistry software aims to:
A) Increase manual calculation skills
B) Enable students to perform complex simulations and analyses
C) Reduce the need for experimental validation
D) Teach software development

21. The application/applications of Artificial Intelligence is/are

(A)Expert Systems

(B)Gaming

(C)Vision Systems

(D)All of the above

22. Who is known as the -Father of AI"?
(A)Fisher Ada
(B)Alan Turing
( C)John McCarthy
(D)Allen Newell

23. In which chromatography stationary phase is more polar than mobile phase?
(A). Ion exchange chromatography
(B.) Normal phase chromatography
(C.) Reversed chromatography
(D.) Size exclusion chromatography.

24. In which type of chromatography, the stationary phase is held in a narrow tube and the mobile phase is forced through it under pressure?
(A) Column chromatography
(B) Planar chromatography
(C ) Liquid chromatography
(D.) Gas chromatography

25.Which of the following guidelines are applicable to Analytical Method validation
(A) ICH Q1
(B) ICH Q2
(C) ICH Q3
(D) ICH Q4

26. In size exclusion chromatography, solute molecules are separated based on _____
(A)Molecular geometry and size
(B)Molecular composition
(C) Molecular phase
(D) Molecular formula

27. Ion exchange chromatography is based on?
(A)Electrostatic attraction
(B) Electrical mobility of ionic species
(C)Partition chromatography
(D)Adsorption chromatography.

28. **Which method of separation will be used to separate butter from curd?**
(A) Sublimation
(B) Chromatography
(C)Centrifugation
(D)All of the above

29. **The process in which the heavier impurities settle at the bottom is ____.**
(A)Decantation
(B)Sedimentation
(C)Filtration
(D)Evaporation

30.A report or account is an:
(A) Informational work
(B) Technical work
(C) Professional work
(D) None of these

31).The data proceed to support the recommendation should be:
(A) Accurate
(B) Unreliable
(C) Incomplete
(D) All of these

32)Report are often used to display the result of:
(A) Experiment
(B) Investigation
(C) Inquiry
(D) All of these

33.) Common formats for report writing are:
(A) Introduction
(B) Method
(C) Both A and B
(D) Inform

34).Which thing we need to do in writing report:
(A)Record the survey not carry out
(B) Record deleted data
(C) Record the object
(D) None

35). In report writing, the language used to be:
(A) Loudly
(B) Unclear
(C) Whispers
(D) Ambiguous

36). The report is always written in:
(A) Sequential manner
(B) Irregular manner
(C) Horizontal manner
(D) Data biased manner

37). Report writing by the individual should be written in:
(A) First person
(B) Last person
(C) Both A, B
(D) None

38)The length of the informal report should be:
(A) 13 pages
(B) 1-3 pages
(C) 1/5-page
(D) full page

39) Report should preferably write__.
(A) Sequential manner
(B) Regular manner c
(C) Irregular manner
(D) None

40). Formal report can be categorized as___.
(A) Informational
(B) Analytical
(C) Recommendation
(D) All of these

# SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

Accredited with CGPA of 3.51 at 'A+' Grade
A College with Potential for Excellence

## CERTIFICATE

Mr./Ku. **Kartik G. Dighore** is awarded with a certificate on successful completion of the course entitled, Certificate course in "Computational Chemistry in Separation Science".

Session 2023-24 under Add-on course conducted for 30 hours from 15/12/2023 to 24/02/2024 by Department of Chemistry, SSESA's, Science College, congress Nagar, Nagpur 440012.

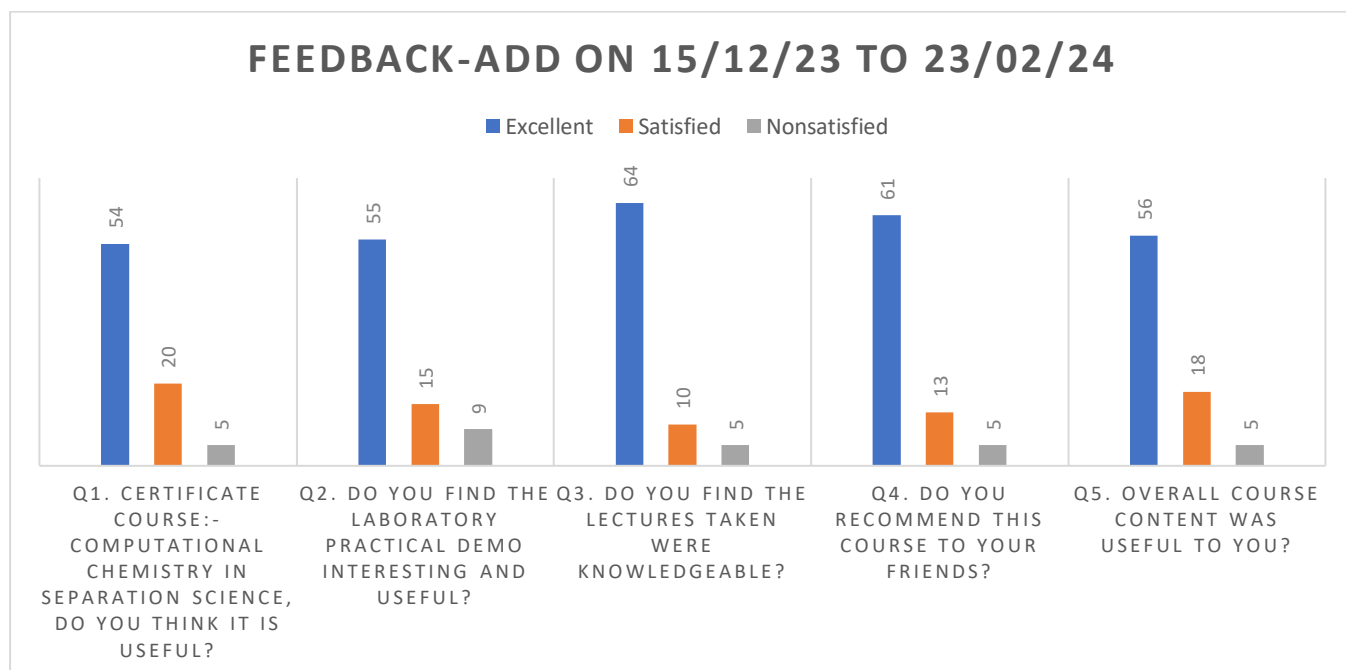He/She has passed the Examination with 'A+' Grade.

**Dr. P. N. Deshmukh**
Coordinator,
Department of Chemistry.

**Prof. M. P. Dhore**
Principal, Science College,
Nagpur.

# Action Taken and Feedback: -

Computational Chemistry in Separation Science, An Add-on course run by the Department of Chemistry Shri Shivaji Science College Nagpur, the motto behind this course is to enrich students with knowledge of Computer in the field of Chemistry, especially in the separation of metal ions, organic pigmentations, etc. It's a 10-week duration course in which theory and practicals are taken. 82 students were enrolled and appeared for theory as well as for practicals. This Course duration was from 15th December 2023 to 23rd February 2024.

No. of benefited Students = 79

## FEEDBACK-ADD ON 15/12/23 TO 23/02/24

■ Excellent  ■ Satisfied  ■ Nonsatisfied

| Question | Excellent | Satisfied | Nonsatisfied |
|---|---|---|---|
| Q1. CERTIFICATE COURSE:- COMPUTATIONAL CHEMISTRY IN SEPARATION SCIENCE, DO YOU THINK IT IS USEFUL? | 54 | 20 | 5 |
| Q2. DO YOU FIND THE LABORATORY PRACTICAL DEMO INTERESTING AND USEFUL? | 55 | 15 | 9 |
| Q3. DO YOU FIND THE LECTURES TAKEN WERE KNOWLEDGEABLE? | 64 | 10 | 5 |
| Q4. DO YOU RECOMMEND THIS COURSE TO YOUR FRIENDS? | 61 | 13 | 5 |
| Q5. OVERALL COURSE CONTENT WAS USEFUL TO YOU? | 56 | 18 | 5 |

Course Coordinator