

SIR C R REDDY COLLEGE

Affiliated to Adikavi Nannaya University, Rajamahendravaram



**2019-20 (EVEN)
16-11-2019**

MINUTES OF BOARD OF STUDIES MEETING

**DEPARTMENT OF CHEMISTRY
SIR C R REDDY COLLEGE ELURU -AP- 534007**



SIR C R REDDY COLLEGE ELURU, W.G.DT

Affiliated to AdikaviNannaya University, Rajamahendravaram

DEPARTMENT OF CHEMISTRY BOARD OF STUDIES MEETING 2019-2020

Meeting of **Board of Studies in Chemistry** was held on 16-11-2019 at 10AM in the Department of Chemistry.

Members present

1	Dr K A Emmanuel, HOD, Chemistry	Chairman
2	DrK Deepthi, Dept. OfChemistry, AdikaviNannayya University, Rajamahendravaram.	University Nominee
3	Dr Y HanumanthaRao, SG Lecturer in Chemistry, Andhra LAYOLA College, Vijayawada.	Subject Expert
4	Dr Rahul, SG Lecturer in Chemistry, JKC College, Guntur.	Subject Expert
5	Sri S V Nagaraju. KusumaHaranatha Agro Chemicals, Vijayarai	Industrialist
6	Dr B Satyanarayana, Murthy Dept of Chemistry, Sir C R R college for PG courses, Eluru	Aluminee
7	Dr K A Ramaraju, Principal	Member
8	Sri D K R S PrakasaRao, Lecturer in Chemistry	Member
9	Sri V A N Satish, Lecturer in Chemistry	Member
10	Sri K Johar, Lecturer in Chemistry	Member
11	Sri D S Pavan Kumar, Lecturer in Chemistry	Member
12	Sri B V Manoj Kumar, Lecturer in Chemistry	Member
13	Sri K Satyanarayana, Lecturer in Chemistry	Member
14	Smt S Krishna Kumari, Lecturer in Chemistry	Member
15	Smt G Sarada, Lecturer in Chemistry	Member
16	Sri P Esubha, Lecturer in Chemistry	Member
17	Sri P Raviteja, Lecturer in Chemistry	Member

Agenda :

1. To prepare syllabus and model question papers for II, IV, VI semester if required.
2. To have additional curriculum for the all the papers for II, IV, VI semesters of any.
3. To suggest methodologies for innovative methods of teaching.
4. To discuss about coordinating research, teaching, extension and other academic activities in the department.
5. To prepare syllabi for value added certificate course II, IV, VI semesters.
6. To discuss the topics for the students study projects and introduce the study projects for final year advanced learners in VI semester.
7. To discuss about the introduction of new courses/ Restructured courses from the Academic year 2020-21.
8. Any other with the permission of the chair.

Purpose of Revision :

1. The courses were updated to focus more on developing the employability skills of the students by keeping them begin preparations for competitive exams especially.
2. To help students obtain a basic understanding the Applications of Chemistry

Discussions:

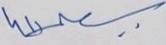
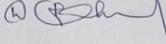
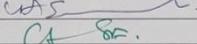
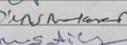
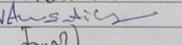
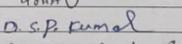
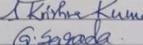
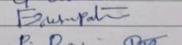
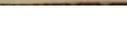
1. Dr. Y. Hanumatharao subject expert suggested that every faculty should attend at least one FDP in one semester such that the faculty will acquaint with new topics
2. University subject expert Dr. K. Deepthi suggested to create a 'chemistry club'. From which all the activities will conduct and keep it in blogs
3. Dr. Rahul subject expert suggested that the department members to approach the old students who are well settled in various fields should start a medal or cash award to those student who excelled in the chemistry subject
4. University subject expert Dr.K. Deepthi suggested to the department prepare budget proposal to organize various programmes including field trips for the students
5. Dr. Rahul subject expert suggested that each faculty should apply one research project per academic year to different funding agency like DST, UGC etc
6. University subject expert Dr.K. Deepthi suggested to every faculty should involve in the research activity

The newly designed B.Sc Syllabus with complete textual revisions were presented in the Board for review and suggestions.

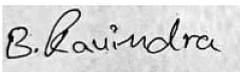
Signature of the experts and members:

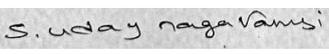
77

DEPARTMENT OF CHEMISTRY – BOARD OF STUDIES MEETING ON : 16-11-2019

MEMBERS PRESENT	SIGNATURE
Dr. K. Deepthi, University Subject expert Assistant Professor, Department of Chemistry, UCST, Adikavi Nannaya University, Rajamahendravaram, Mobile : 9985469607	
Dr. Y. Hanumantha Rao, Subject expert-I SG Lecturer in Chemistry, Andhra Loyola College, Vijayawada, Mobile : 9440672006	
Dr. Rahul, Subject expert-II SG lecturer in Chemistry, JKC College, Guntur, Mobile : 9849925599	
Sri S.V.Naga Raju, Industrialist Kusuma Harinadha Agro Chemicals, Vijarai, Pedavegi mandal, West Godavari district	
Dr. B. Satyanarayana Murthy, Alumni Lecturer in Chemistry, Sir C.R.R College of PG Courses, Mobile : 8309802457	
Dr. K.A.Emmanuel, HOD, Dept of Chemistry	
Dr. K.A. Rama Raju, Principal	
Sri DKRS Prakasarao	
Sri VAN Satish	
Sri K. Johar	
Sri D.Seshu Pavan Kumar	
Sri B.V Manoj Kumar	
Sri K. Satyanarayana	
Smt S. Krishna Kumari	
Smt G. Sarada	
Sri P. Esubha	
Sri P. Ravi Teja	

Meritorious students:

B. Ravindra 

S. Uday Naga Vamsi 

Syllabus Deviation		Employability	
Entrepreneurship		Skill Development	

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

I B.Sc - CHMISTRY - SEMESTER-II

PAPER - II : ORGANIC AND GENERAL CHEMISTRY

60hrs (4 h/w)

COURSE TITLE	MAJOR CORE 1-ORGANIC & GENERAL CHEMISTRY -1
TOTAL HOURS	60 Hrs
HOURS/WEEK	4 T+2P
COURSE CODE	CHE-1B
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	60
Programme code	5101UMPCS 5503UBZC 1830UFZC 1728UMCCS

Objectives:

To understand about Alkanes and Cycloalkanes, Alkenes & Alkynes, Benzene and its reactivity, Surface chemistry and chemical bonding, HSAB , Stereochemistry of carbon compounds .



SIRC.R.REDDY COLLEGE,ELURU
(Affiliated to Adikavi Nannaya University)

I Year B.Sc. - II Semester *Syllabus*

Subject: CHEMISTRY

Paper II : Physical & General chemistry

UNIT-I

Solid-state

10h

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. **Definition** of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. **Defects in crystals**. Stoichiometric and non-stoichiometric defects.

UNIT-II

1. Gaseous state

6 h

Compression factors, deviation of real gases from ideal behavior. **Vander Waal's** equation of state. P-V Isotherms of real gases, **Andrew's isotherms** of carbon dioxide, continuity of state. Critical phenomena. The Vander Waal's equation and the critical state. **Law of corresponding states**. Relationship between critical constants and Vander Waal's constants. Joule Thomson effect.

2. Liquid state

4 h

Structural **differences** between solids, liquids and gases. Liquid crystals, the mesomorphic state. Classification of liquid crystals into Smectic and Nematic. Differences between liquid crystal and solid/liquid. **Application of liquid crystals as LCD devices.**

UNIT-III

Solutions

10h

Liquid-liquid - ideal solutions, **Raoult's law**. Ideally dilute solutions, Henry's law. Non-ideal solutions. Vapour pressure - composition and vapour pressure- temperature curves. Azeotropes-HCl-H₂O, ethanol-water systems and fractional distillation. Partially miscible liquids **-phenol-water**, trimethylamine-water, nicotine-water systems. Effect of impurity on consolute temperature. Immiscible liquids and steam distillation. **Nernst distribution law**. Calculation of the partition coefficient. Applications of distribution law.

UNIT-IV

1. Surface chemistry**8 h**

Definition of **colloids**. Solids in liquids (sols), preparation, purification, properties - kinetic, optical, electrical. Stability of colloids, Hardy-Schulze law, protective colloid. Liquids in liquids (emulsions) preparation, properties, uses. Liquids in solids (gels) preparation, uses.

Adsorption: Physical **adsorption**, chemisorption. Freundlich, Langmuir adsorption isotherms. Applications of adsorption

2. Chemical Bonding**7h**

Valence bond theory, hybridization, **VB theory** as applied to ClF_3 , $\text{Ni}(\text{CO})_4$, Molecular orbital theory - LCAO method, construction of **M.O. diagrams** for homo- nuclear and hetero-nuclear diatomic molecules (N_2 , O_2 , CO and NO).

UNIT-V

Stereochemistry of carbon compounds**15 h**

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae.

Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation.

Chiral molecules- definition and criteria (Symmetry elements)- Definition of enantiomers and diastereomers – **Explanation of optical isomerism** with examples Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane.

D,L and R,S configuration methods and E,Z- configuration with examples.

List of Reference Books

1. Principles of physical chemistry by Prutton and Marron
2. Solid State Chemistry and its applications by Anthony R. West
3. Text book of physical chemistry by K L Kapoor
4. Text book of physical chemistry by S Glasstone
5. Stereochemistry of Organic compounds by E L Eliel
6. Advanced Organic Chemistry by F A Carey and R J Sundberg
7. Stereochemistry by P.S. Kalsi
8. Stereochemistry of Organic compounds by D. Nasipuri
9. Advanced physical chemistry by Bahl and Tuli
10. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwS0wsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepOEC&printsec=copyright#v=onepage&q&f=false>

REFERENCE BOOKS:

1. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
4. Eliel, E. L. & Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994. Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.

Practical:

1. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press(2000).
2. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press(2000).
3. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson(2012)

Web links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepOEC&printsec=copyright#v=onepage&q&f=false>

CO1: To understand about properties of solids and characters of solids

CO2: To understand about the properties of liquids and gases

CO3: To gain knowledge about Basic definitions and azeotropic mixtures, CST systems

CO4: To gain knowledge about Colloidal solutions, Emulsions and Adsorptions.

CO5: To gain knowledge about formation of bonds and Bonding theories. To gain knowledge about Isomerism of Carbon compounds and stereo Chemistry of carbon compounds.

Programme specific outcomes :

Recapitulation of Basics of Organic chemistry:

PSO-1 :solid state

To understand about properties of solids and characters of solids

PSO-2 :gaseous state & liquid state

To understand about the properties of liquids and gases

PSO-3 :solution

To gain knowledge about Basic definitions and azeotropic mixtures, CST

systems **PSO-4 :surface chemistry:**

To gain knowledge about Colloidal solutions, Emulsions and Adsorptions.

PSO-5 :Stereochemistry of carbon compounds:

To gain knowledge about formation of bonds and Bonding theories. To gain knowledge about Isomerism of Carbon compounds and stereo Chemistry of carbon compounds

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions	No. of Very Short Answer Questions
01	I	1+1	1+1	1+1
02	II	1+1	1+1	1+1
03	III	1+1	1	1
04	IV	1	1+1	1
05	V	1	1	1+1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
I Year B.Sc. (II Semester) Model Paper
Subject: **CHEMISTRY**
PAPER – II PHYSICAL & GENERAL CHEMISTRY

Time: 3Hrs

Maximum

Marks: 75

Pass Minimum: 26

----- **PART – I**

Answer any FOUR questions choosing atleast one from each section. 4 x 10 =

40M SECTION -A

1.

2.

3.

4.

SECTION – B

5.

6.

7.

8.

PART – II

Answer any FIVE of the following:

9.

5 x 5 = 25M

10.

11.

12.

13.

14.

15.

16

PART – III

Answer any FIVE of the following:

5 x 2 =10M

17.

18.

19.

20.

21.

22.

23.

24.

LABORATORY COURSE –II

30 hrs (2h/ w)

Practical-II Mixture Analysis

(At the end of semester-II)

Qualitative inorganic analysis

Analysis of Mixture salt containing two anions and cations from the following

Anions:

carbonate, Sulphate, Chloride, Bromide, Iodide, Acetate, Borate, Nitrate, Phosphate

Cations:

Lead, Copper, Iron, Aluminium, Zinc, Manganese, Nickel, Calcium, Strontium, barium, potassium and ammonium.

SIR C R REDDY COLLEGE, ELURU

II Year B.Sc. (IV Semester) Syllabus

Subject: CHEMISTRY

Paper-IV:SPECTROSCOPY AND PHYSICAL CHEMISTRY

60 hrs (4 h / w)

COURSE TITLE	MAJOR CORE 1-SPECTROSCOPY&PHYSICAL CHEMISTRY
TOTAL HOURS	60 Hrs
HOURS/WEEK	4 T+2P
COURSE CODE	CHE-2B
COURSE TYPE	THEORY
CREDITS	3+2
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

Objectives:

To understand about UV, IR, NMR- Spectroscopy and phase rule, dilute solutions, electrochemistry

SPECTROSCOPY – 30 hrs (2h/w)

UNIT-I

6 h

General features of absorption spectroscopy - Beer-Lambert's law and its limitations, transmittance, Absorbance and molar absorptivity. Single and double beam spectrophotometers. Application of Beer-Lambert law for quantitative analysis of

1. Chromium in $K_2Cr_2O_7$
2. Manganese in Manganous sulphate

Electronic spectroscopy:

8h

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 molecule 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.

Proton magnetic resonance spectroscopy (1H-NMR)

8h

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of

signals. Chemical shift – factors affecting chemical shift - NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde and acetophenone.

PHYSICAL CHEMISTRY 30 hrs (2h / w)

UNIT-III

Dilute solutions

10h

Colligative properties. Raoult's law, relative lowering of vapour pressure, its relation to molecular weight of non-volatile solute. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods of determination – (a) Lowering of vapour pressure by Ostwald and Walker's method (b) Elevation of boiling method by Landsberg's method (c) Depression in freezing point by Beckmann's method. Osmosis, osmotic pressure, experimental determination by Berkeley and Hartley's method. Theory of dilute solutions. Determination of molecular weight of non-volatile solute from osmotic pressure. Abnormal Colligative properties- Van't Hoff factor

UNIT-IV

1. Electrochemistry-I

10h

Specific conductance, equivalent conductance. Variation of equivalent conductance with dilution. Migration of ions, Kohlrausch's law. Arrhenius theory of electrolyte dissociation and its limitations. Ostwald's dilution law. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Definition of transport number, determination by Hittorf's method. Application of conductivity measurements- conductometric titrations.

2. Electrochemistry-II

4h

Single electrode potential, sign convention, Reversible and irreversible cells, Nernst Equation- Reference electrode, Standard Hydrogen electrode, calomel electrode. Calculation of EMF of cell from SRP values.

UNIT-V

Phase rule

6h

Concept of phase, components, degrees of freedom. Phase equilibrium of one component - water system. Phase equilibrium of two- component system, solid-liquid equilibrium. Simple eutectic diagram simple eutectic diagram of NaCl-Water system of Pb-Ag system, Freezing mixtures.

Additional Syllabus:

Electrochemistry: Potentiometric Titrations.

Phase rule : Desilverisation of Lead, Mg-Zn System.

List of Reference Books

1. Spectroscopy by William Kemp
2. Spectroscopy by Pavia
3. Organic Spectroscopy by J. R. Dyer
4. Modern Electrochemistry by J.O. M. Bockris and A.K.N. Reddy
5. Advanced Physical Chemistry by Atkins
6. Introduction to Electrochemistry by S. Glasstone
7. Elementary organic spectroscopy by Y.R. Sharma
8. Spectroscopy by P.S. Kalsi

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepQEC&printsec=copyright#v=onepage&q&f=false>

Course outcomes :

At the end of the Course, the student will be able to ;

CO-1 : Understand the basic concepts of Absorption spectroscopy, electronic spectroscopy, IR Spectroscopy, H-NMR spectroscopy.

CO-2 : Understand the basic concepts of Dilute solutions and Electro chemistry

Programme specific outcomes :

PSO-1 :General features of absorption spectroscopy:

To gain knowledge about Beers Lamberts Law ,Transmittance, Absorbance, single and Double Beam spectrophotometer and applications of beers lamberts law

PSO-2 :Electronic Spectroscopy:

To gain knowledge about energy levels of molecular orbitals and types of electronic transitions and concepts of chromophores and auxochromes

PSO-3 : IR Spectroscopy

To gain knowledge about Modes of vibrations in di atomic and poly atomic molecules and characteristics of absorption bands of different functional groups.

PSO-4 : Proton Magnetic resonance spectroscopy:

To gain knowledge about Principles of NMR, chemical shift, Spin-spin coupling and Applications of NMR.

PSO-5 : Dilute solutions :

Colligative Properties, Roults Law, Experimental determination methods of RLVP, elevation of boiling point ,depression in freezing point. Osmotic pressure

PSO-6 : Electrochemistry-I

To gain knowledge about Kohlrausch Law, Arrhenius theory, Ostwalds dilution law,

Debye-Huckel-on sagars equation, Definition of Transport number and Determination of Hittorfs method.

PSO-7 : Electrochemistry-II

To gain knowledge about , Nernst equation, SHE, Calomel electrode, Applications of EMF Measurements

PSO-8 : Phase rule:

To gain knowledge about one component system, two component system, freezing mixtures

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

II B.Sc – CHMISTRY – SEMESTER-IV

PAPER – IV : SPECTROSCOPY & PHYSICAL CHEMISTRY

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNI T	No. of Essay Questions	No. of Short Answer Questions	No. of Very Short Answer Questions
01	I	1+ 1	1+ 1	1+ 1
02	II	1+ 1	1+ 1	1+ 1
03	III	1+ 1	1	1
04	IV	1	1+1	1
05	V	1	1	1+1

SIR C R REDDY COLLEGE ,ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
II Year B.Sc. (IV Semester) Model Paper
Subject: **CHEMISTRY**
PAPER – IV : SPECTROSCOPY & PHYSICAL CHEMISTRY

Time:3Hrs

Maximum

Marks:75

Pass Minimum: 26

----- **PART – I**

Answer any FOUR questions choosing atleast one from each section. 4 x 10 =

40M SECTION -A

1.

2.

3.

4.

SECTION – B

5.

6.

7.

8.

PART – II

Answer any FIVE of the following:

9.

5 x 5 =25M

10.

11.

12.

13.

14.

15.

16

PART – III

Answer any FIVE of the following:

5 x 2 =10M

17.

18.

19.

20.

21.

22.

23.

24.

LABORATORY COURSE –IV
30 hrs (2h/ w)
Practical-IV Titrimetric Analysis
(At the end of semester-IV)

Titrimetric Analysis:

1. Determination of MgSO_4 by using EDTA as a primary standard
2. Determination of ZnSO_4 by using EDTA as a primary standard
3. Determination of Hardness of Water by using EDTA

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

IIIB.Sc – CHMISTRY –SEMESTER-VI

PAPER – VII-A : ANALYTICAL METHODS IN CHEMISTRY

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1 ANALYTICAL METHODS IN CHEMISTRY
TOTAL HOURS	45 Hrs
HOURS/WEEK	3 T+2P
COURSE CODE	CHE-1A
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

UNIT-I

10 h

Quantitative analysis:

- a) Importance in various fields of science, steps involved in chemical analysis. Principles of volumetric analysis :. Theories of acid-base, redox, complexometric, iodometric and precipitation titrations - choice of indicators for these titrations.
- b) Principles of gravimetric analysis: precipitation, coagulation, peptization, co-precipitation, post precipitation, digestion, filtration and washing of precipitate, drying and ignition.

UNIT-II

7h

Treatment of analytical data:

Types of errors, significant figures and its importance, accuracy - methods of expressing accuracy, error analysis and minimization of errors, precision - methods of expressing precision, standard deviation and confidence limit.

UNIT-III

Separation

techniques

in chemical analysis:

8 h

Introduction, principle, techniques, factors affecting solvent extraction, Batch extraction, continuous extraction and counter current extraction. Synergism., Application - Determination of Iron (III)

Ion exchange : Introduction, action of ion exchange resins, separation of inorganic mixtuers, applications, Solvent extraction: Principle and process.

Chromatography: Classification of chromatography methods, principles of differential migration and adsorption phenomenon, Nature of adsorbents, solvent systems, Rf values, factors effecting Rf values.

Paper Chromatography: Principles, Rf values, experimental procedures, choice of paper and solvent systems, developments of chromatogram - ascending, descending and radial. Two dimensional chromatography - applications.

UNIT-V

10 h

Thin layer Chromatography (TLC): Advantages - Principles, factors effecting Rf values - Experimental procedures - Adsorbents and solvents - Preparation of plates - Development of the chromatogram - Detection of the spots - Applications - Column Chromatography: Principles - experimental procedures - Stationary and mobile Phases - Separation technique - Applications. HPLC : Basic principles and applications.

REFERENCE BOOKS

1. Analytical Chemistry by Skoog and Miller
2. A textbook of qualitative inorganic analysis by A.I. Vogel
3. Nanochemistry by Geoffrey Ozin and Andre Arsenault
4. Stereochemistry by D. Nasipuri
5. Organic Chemistry by Clayden

Web Links

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechan.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepQEC&printsec=copyright#v=onepage&q&f=false>

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VII-A : ANALYTICAL METHODS IN CHEMISTRY

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1	1
03	III	1	1+1
04	IV	1+1	1+1
05	V	1+1	1

SIR C R REDDY COLLEG, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
III Year B.Sc. (VI Semester) Model Paper
Subject: **CHEMISTRY**

PAPER – VII-A : ANALYTICAL METHODS IN CHEMISTRY

Time:3Hrs

Maximum Marks:75
Pass Minimum: 26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

CHEMISTRY LABORATORY COURSE – VII-A
(at the end of semester VI)

30 hrs (2 h / w)

50 Marks

1. Identification of amino acids by paperchromatography.
2. Determination of Zn usingEDTA
3. Determination of Mg usingEDTA

w.e.f. 2015-16 Admitted batch(CBCS)Pattern
SIR C R REDDY COLLEGE, ELURU
 (Affiliated to Adikavi Nannaya University, Rajamahendravaram)
III Year B.Sc. (VI Semester) Syllabus
 Subject: **CHEMISTRY**

PAPER-VII-B : ENVIRONMENTAL CHEMISTRY

COURSE TITLE	MAJOR CORE 1- ENVIRONMENTAL CHEMISTRY
TOTAL HOURS	45 Hrs
HOURS/WEEK	3 T+2P
COURSE CODE	CHE7-3B
COURSE TYPE	THEORY
CREDITS	3+2
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

Objectives

To understand about Air Pollution , Water pollution, Chemical Toxicology, Ecosystem, Solid Waste management, Disaster management.

UNIT-I

9

h

Introduction

Concept of Environmental chemistry - Scope and importance of environment in now a days – Nomenclature of environmental chemistry – Segments of environment - Natural resources – Renewable Resources – Solar and biomass energy, Hydro power and Non-renewable resources – Thermal power and atomic energy, natural gas – Oxygen cycle and Hydological cycle.

UNIT-II

Air Pollution

9

h

Definition – Sources of air pollution – Classification of air pollution – Acid rain – Photochemical smog – Green house effect – Formation and depletion of ozone – Bhopal gas disaster – Controlling methods of air pollution.

UNIT-III

Water pollution

9

h

Unique physical and chemical properties of water – water quality and criteria for finding of water quality – Dissolved oxygen – BOD, COD, Suspended solids, total dissolved solids, alkalinity – Hardness of water – Methods to convert temporary hard water into

soft water – Methods to convert permanent hard water into soft water – eutrophication and its effects – principal wastage treatment – Industrial waste water treatment.

UNIT-IV

Chemical Toxicology

9

h

Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effects – toxicity of lead, mercury, arsenic and cadmium.

UNIT-V

9h

- (a) **Ecosystem** : Concepts – structure – Functions and types of ecosystem – Abiotic and biotic components – Energy flow and Energy dynamics of ecosystem – Food chains – Food web – Tropic levels.
- (b) **Solid Waste management**: Biodegradable– Non biodegradable waste – Types of solid waste disposable – Landfill – Composition – Incineration – Recycling – Pyrolysis – Reduction in use.
- (c) **Disaster management** : Floods – Drought – Earthquakes – Cyclones

Additional Syllabus:

Biodiversity: Definition – level and types of biodiversity – concept - significance – magnitude and distribution of biodiversity – trends – bio geographical classification of India – biodiversity at national, global and regional level.

List of Reference Books

1. Fundamental of ecology by M.C.Dash
2. A text book of environmental chemistry by W.Moore and F.A.Moore
3. Environmental chemistry by samir K.Banerj

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechanism.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepQEC&printsec=copyright#v=onepage&q&f=false>

Course Outcomes:

At the end of the course, the students will be able to;

CO-1 : Understand the basic concepts of environmental chemistry, scope and importance of environment in now a days .

CO-2 : Understand the basic concepts of air pollution-sources of air pollution -controlling methods of air pollution.

CO-3 : Understand the basic concepts of water quality and criteria for finding of water quality-methods to convert temporary hard water into soft water, methods to convert permanent hard water into soft water.

CO-4 : Understand the basic concepts of toxic chemicals in the environment

–effects of toxic chemicals.

CO-5 : Understand the basic concepts of Eco system functions and types of Eco system.

Programme specific Outcomes:

PSO-1 : INTRODUCTION-CONCEPT OF ENVIRONMENT CHEMISTRY:

To gain knowledge about scope and importance of environment in now a days

PSO-2 : AIR POLLUTION:

To gain knowledge about air pollution-sources of air pollution –controlling methods of air pollution.

PSO-3 : WATER POLLUTION:

To gain knowledge about water quality and criteria for finding of water quality-methods to convert temporary hard water into soft water, methods to convert permanent hard water into soft water.

PSO-4 : CHEMICAL TOXICOLOGY:

To gain knowledge about toxic chemicals in the environment –effects of toxic chemicals.

PSO-5 : ECO SYSTEM,SOLID WASTE MANAGEMENT& DISASTER MANAGEMENT:

To gain knowledge about functions and types of Eco system, solid waste management, Disaster management.

SIR C R REDDY COLLEGE , ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VII-B : ENVIRONMENTAL CHEMISTRY

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1	1
03	III	1+1	1+1
04	IV	1	1
05	V	(a)-1 (b)-1 (c)--	- 1 1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
III Year B.Sc. (VI Semester) Model Paper
Subject: **CHEMISTRY**

PAPER – VII-B : ENVIRONMENTAL CHEMISTRY

Time:3Hrs

Maximum

Marks:75

Pass

Minimum: 26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

CHEMISTRY LABORATORY COURSE – VII-B

(at the end of semester VI)

30 hrs (2 h /w)

50Marks

1. Determination of carbonate and bicarbonate in water samples (acidity and alkalinity)
2. Determination of hardness of water using EDTA
 - a) Permanent hardness
 - b) Temporary hardness
3. Determination of Acidity
4. Determination of Alkalinity
5. Determination of chlorides in water samples

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University,
Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VII-C : GREEN CHEMISTRY

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1 GREEN CHEMISTRY
TOTAL HOURS	45Hrs
HOURS/WEEK	3T+2P
COURSE CODE	CHE-1A
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

UNIT-I

10 h

Green Chemistry: Introduction - Definition of green chemistry, need of green chemistry, basic principles of green chemistry. Green synthesis - Evaluation of the type of the reaction i) Rearrangements (100% atom economic), ii) Addition reactions (100% atom economic). Organic reactions by Sonication method: apparatus required examples of sonochemical reactions (Heck, Hunsdiecker and Wittig reactions).

UNIT-II

10 h

Selection of solvent: i) Aqueous phase reactions ii) Reactions in ionic liquids, Heck reaction, Suzuki reactions, epoxidation. iii) Solid supported synthesis Super critical CO₂: Preparation, properties and applications, (decaffeination, dry cleaning)

UNIT-III

10 h

Microwave and Ultrasound assisted green synthesis: Apparatus required, examples of MAOS (synthesis of fused anthro quinones, Leuckart reductive amination of ketones) - Advantages and disadvantages of MAOS Aldol condensation-Cannizzaro reaction-Diels-Alder reactions-Strecker's synthesis.

UNIT-IV

5 h

Green catalysis: Heterogeneous catalysis, use of zeolites, silica, alumina, supported catalysis- biocatalysis: Enzymes, microbes Phase transfer catalysis (micellar/surfactant)

UNITV

10 h

Examples of green synthesis / reactions and some real world cases: 1. Green synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative Strecker's synthesis) 2. Microwave assisted reaction in water – Hoffmann elimination – methyl benzoate to benzoic acid – oxidation of toluene and alcohols – microwave assisted reactions in organic solvents. Diels-Alder reactions and decarboxylation reaction. 3. Ultrasound assisted reactions – sonochemical Simmons –Smith reaction (ultrasonic alternative to iodine).

REFERENCE BOOKS

1. Green Chemistry Theory and Practice. P.T. Anatas and J.C. Warner
2. Green Chemistry V.K. Ahluwalia Narosa, New Delhi.
3. Real world cases in Green Chemistry M.C. Cann and M.E. Connelly
4. Green Chemistry: Introductory Text M. Lancaster: Royal Society of Chemistry (London)
5. Green Chemistry: Introductory Text, M. Lancaster
6. Principles and practice of heterogeneous catalysis, Thomas J.M., Thomas M.J., John Wiley
7. Green Chemistry: Environmental friendly alternatives R S Sanghli and M.M. Srivastava, Narosa Publications

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechanism.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepOEC&printsec=copyright#v=onepage&q&f=false>

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VII-C : GREEN CHEMISTRY

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1	1+1
03	III	1+1	1
04	IV	1	1
05	V	1+1	1+1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
III Year B.Sc. (VI Semester) Model Paper
Subject: **CHEMISTRY**

PAPER – VII-C : GREEN CHEMISTRY

Time:3Hrs

Maximum Marks:75

Pass Minimum: 26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

CHEMISTRY LABORATORY COURSE – VII-C

(at the end of semester VI)

30 hrs (2 h /w)

50Marks

1. Green procedure for organic qualitative analysis: Detection of N, S and halogens
2. Acetylation of 1^o amine by green method: Preparation of acetanilide
3. Rearrangement reaction in green conditions: Benzil-Benzilic acid rearrangement
4. Electrophilic aromatic substitution reaction: Nitration of phenol
5. Radical coupling reaction: Preparation of 1,1-bis-2-naphthol
6. Green oxidation reaction: Synthesis of adipic acid
7. Green procedure for Diels Alder reaction between furan and maleic anhydride

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHEMISTRY – SEMESTER-VI

PAPER – VIII-A-1 : POLYMER CHEMISTRY

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1 POLYMER CHEMISTRY
TOTAL HOURS	45 Hrs
HOURS/WEEK	3 T+2P
COURSE CODE	CHE-1A
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

UNIT-I

12 h

Introduction of polymers:

Basic definitions, degree of polymerization ,classification of polymers - Natural and Synthetic polymers, Organic and Inorganic polymers, Thermoplastic and Thermosetting polymers, Plastics, Elastomers, Fibres and Resins, Linear, Branched and Cross Linked polymers, Addition polymers and Condensation Polymers, mechanism of polymerization. Free radical, ionic and Zeigler – Natta polymerization.

UNIT-II

10 h

Techniques of Polymerization: Bulk polymerization , solution polymerization, suspension and emulsion polymerization. Molecular weights of polymers: Number average and weight average molecular weights Determination of molecular weight of polymers by Viscometry and Osmometry methods.

UNIT-III

6 h

Kinetics of Free radical polymerization, Glass Transition temperature (T_g) and Determination of T_g: Free volume theory, WLF equation, factors affecting glass transition temperature (T_g).

UNIT-IV

9 h

Polymeradditives:

Introduction to plastic additives – fillers, Plasticizers and Softeners, Lubricants and Flow Promoters, Anti aging additives, Flame Retardants, Colourants , Blowing agents, Cross linking agents, Photo stabilizers, Nucleatingagents.

UNIT-V

8 h

Polymers and their applications:

Preparation and industrial applications of Polyethylene, Polyvinyl chloride, Teflon, Terelene, Polyacrylonitrile, Nylon6,6 and silicones.

REFERENCE BOOKS

1. Seymour, R.B. & Carraher, C.E. Polymer Chemistry: An Introduction, Marcel Dekker, Inc. New York,1981.
2. Odian, G. Principles of Polymerization, 4th Ed. Wiley,2004.
3. Billmeyer, F.W. Textbook of Polymer Science, 2nd Ed. Wiley Interscience,1971.
4. Ghosh, P. Polymer Science & Technology, Tata McGraw-Hill Education,1991.34
5. Lenz, R.W. Organic Chemistry of Synthetic High Polymers. Interscience Publishers, NewYork,1967.

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepOEC&printsec=copyright#v=onepage&q&f=false>

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-A-1 : POLYMER CHEMISTRY

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1+1	1
03	III	1	1
04	IV	1+1	1+1
05	V	1	1+1

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III Year B.Sc. (VI Semester) Model Paper

Subject: **CHEMISTRY**

PAPER – VIII-A-1 : POLYMER CHEMISTRY

Time:3Hrs

Marks:75

Maximum

Pass

Minimum:

26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

2016-2017

LABORATORY COURSE

–VIII

30 hrs (2h/ w)

Practical paper-VIII-A1

(At the end of semester-VI)

- 1.Preparation of Aspirin
- 2.Preparation of Paracetamol
- 3.Preparation of acetanilide
- 4.Preparation of barbituric acid
- 5.Preparation of phenyl azo
 β -Naphthol

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-A-2 : INSTRUMENTAL METHODS OF ANALYSIS

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1 INSTRUMENTAL METHODS OF ANALYSIS
TOTAL HOURS	45 Hrs
HOURS/WEEK	3T+2P
COURSE CODE	CHE-1A
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

UNIT – I

Introduction to spectroscopic methods of analysis:

4 h

Recap of the spectroscopic methods covered in detail in the core chemistry syllabus: Treatment of analytical data, including error analysis. Classification of analytical methods and the types of instrumental methods. Consideration of electromagnetic radiation.

UNIT – II

Molecular spectroscopy:

8 h

Infrared spectroscopy:

Interactions with molecules: absorption and scattering, Means of excitation (light sources), separation of spectrum (wavelength dispersion, time resolution), detection of the signal (heat, differential detection), interpretation of spectrum (qualitative, mixtures, resolution), advantages of Fourier Transform (FTIR), Samples and results expected, Applications: Issues of quality assurance and quality control.

UNIT-III

10 h

UV-Visible/ Near IR – emission, absorption, fluorescence and photoacoustic, Excitation sources (lasers, time resolution), wavelength dispersion (gratings, prisms, interference filters, laser, placement of sample relative to dispersion, resolution), Detection of signal (photocells, photomultipliers, diode arrays, sensitivity and S/N), Single and Double Beam instruments, Interpretation (quantification, mixtures, absorption vs. fluorescence and the use of time, photoacoustic, fluorescent tags).

UNIT - IV

Separation

techniques

15 h

Chromatography: Gas chromatography, liquid chromatography, supercritical fluids, Importance of column technology (packing, capillaries), Separation based on increasing number of factors (volatility, solubility, interactions with stationary phase, size, electrical field), Detection: simple vs. specific (gas and liquid), Detection as a means of further analysis (use of tags and coupling to IR and MS). Mass spectrometry: Making the gaseous molecule into an ion (electron impact, chemical ionization), Making liquids and solids into ions (electrospray, electrical discharge, laser desorption, fast atom bombardment), Separation of ions on basis of mass to charge ratio, Magnetic, Time of flight, Electric quadrupole. Resolution, time and multiple separations, Detection and interpretation (how this is linked to excitation).

UNIT - V

Elemental analysis:

8 h

Mass spectrometry (electrical discharges).

Atomic spectroscopy: Atomic absorption, Atomic emission, and Atomic fluorescence. Excitation and getting sample into gas phase (flames, electrical discharges, plasmas), Wavelength separation and resolution (dependence on technique), Detection of radiation (simultaneous/scanning, signal noise), Interpretation (errors due to molecular and ionic species, matrix effects, other interferences). NMR spectroscopy: Principle, Instrumentation, Factors affecting chemical shift, Spin coupling, Applications.

REFERENCE BOOKS

1. Skoog, D.A., Holler F.J. & Nieman, T.A. Principles of Instrumental Analysis, Cengage Learning India Ed.
2. Willard, H.H., Merritt, L.L., Dean, J. & Settle, F.A. Instrumental Methods of Analysis, 7th Ed. Wadsworth Publishing Company Ltd., Belmont, California, USA, 1988.
3. P.W. Atkins: Physical Chemistry.
4. G.W. Castellan: Physical Chemistry.
5. C.N. Banwell: Fundamentals of Molecular Spectroscopy.
6. Brian Smith: Infrared Spectral Interpretations: A Systematic Approach.
7. W.J. Moore: Physical Chemistry

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.h

- [tml?id=h3SwSQwsHsYC&redir_esc=y](#)
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
 3. <https://books.google.co.in/books?id=mnsKyupepOEC&printsec=copyright#v=onepage&q&f=false>

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-A-2 : INSTRUMENTAL METHODS OF ANALYSIS

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1	1
02	II	1	1
03	III	1+1	1+1
04	IV	1+1	1+1
05	V	1+1	1+1

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III Year B.Sc. (VI Semester) Model Paper

Subject: CHEMISTRY

PAPER - VIII-A-2 : INSTRUMENTAL METHODS OF ANALYSIS

Time:3Hrs

Marks:75

Maximum

Pass

Minimum:

26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

LABORATORY COURSE –VIII

30 hrs (2h/ w)

Practical paper-VIII-A2

(At the end of semester-VI)

- 1.Green procedure for Organic qualitative analysis detection of nitrogen , sulphur and halogens.
- 2.Acetylation of primary amine by green method: Preparation of acetanilide
- 3.Rearrangement reactions in green condition: Benzil-Benzilic acid rearrangement.
- 4.Electrophilic aromatic substitution reaction: Nitration of phenol
- 5.Radical coupling reaction : Preparation of 1,1-bis-2-naphthol
- 6.Green oxidation reaction : synthesis of adipic acid
- 7.Green procedure for Diels Alder reaction between furan and maleic anhydride

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

**PAPER – VIII-A-3 : ANALYSIS OF DRUGS, FOODS, DAIRY
PRODUCTS & BIO-CHEMICAL ANALYSIS**

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1 ANALYSIS OF DRUGS, FOODS, DAIRY PRODUCTS & BIO-CHEMICAL ANALYSIS
TOTAL HOURS	45 Hrs
HOURS/WEEK	3 T+2P
COURSE CODE	CHE-1A
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

UNIT- I

10 h

Analysis of the following drugs and pharmaceuticals preparations: (Knowledge of molecular formula, structure and analysis) Analysis of analgesics and antipyretics like aspirin and paracetamol.

Analysis of antimicrobials like chloroquine. Analysis of drugs in the treatment of infections and infestations: Amoxicillin, chloramphenicol, penicillin, tetracycline. Anti tuberculous drug-isoniazid.

UNIT-II

6 h

Analysis of the following drugs and pharmaceuticals preparations: (Knowledge of molecular formula, structure and analysis) Analysis of antihistamine drugs and sedatives like allegra, zyrtec (cetirizine), alprazolam, trazodone, lorazepam, ambien (zolpidem), diazepam.

UNIT-III

10 h

Analysis of anti epileptic and anti convulsant drugs like phenobarbital and phenacetamide. Analysis of cardiovascular drugs like atenolol, norvasc (amlodipine). Analysis of lipitor (atorvastatin) - a drug for the prevention of production of cholesterol. Analysis of diuretics like furosemide (Lasix). Analysis of prevacid (lansoprazole) - a drug used for the prevention of production of acids in stomach.

UNIT-IV

10 h

Analysis of Milk and milk products: Acidity, total solids, fat, total nitrogen, proteins, lactose, phosphate activity, casein, choride. Analysis of food materials - Preservatives: Sodium carbonate, sodium benzoate, sorbic acid. Coloring matters - Brilliant blue FCF, fast green FCF, sunset yellow FCF. Flavoring agents - Vanilla, diacetyl, isoamyl acetate, limonene. Adulterants in rice and wheat, wheat floor, coconut oil, coffee powder, tea powder, **milk**.

UNIT-V

9 h

Clinical analysis of blood: Composition of blood, clinical analysis, trace elements in the body. Estimation of blood chlolesterol, glucose, enzymes, RBC & WBC, Blood gas analyser.

REFERENCE BOOKS

1. F.J. Welcher - Standard methods of analysis.
2. A.I.Vogel - A text book of quantitative Inorganicanalysis-ELBS.
3. F.D. Snell & F.M. Biffen - Commercial methods of analysis-D.B.Taraporavala &sons.
4. J.J.Elving and I.M.Kolthoff - Chemical analysis - A series of monographs on analytical chemistry and its applications -- Inter Science- Vol I toVII.
5. Aanalytical Agricultrual Chemistry by S.L.Chopra & J.S.Kanwar -- KalyaniPublishers
6. Quantitative analysis of drugs in pharmaceutical formulations by P.D.Sethi, CBS Publishers and Distributors, NewDelhi.
7. G.Ingram- Methods of organic elemental micro analysis- Chapman andHall.
8. H.Wincciam and Bobbles (Henry J)- Instrumental methods of analysis of foodadditives.
9. H.Edward-The Chemical analysis of foods; practical treatise on the examination of food stuffs and the detection ofadulterants.
10. The quantitative analysis of drugs- D.C.Garratt-Chapman &Hall.
11. A text book of pharmaceutical analysis byK.A.Connors-Wiley-International.

12. Comprehensive medicinal chemistry-Ed Corwin Hansch Vol
5,PergamonPress.

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepOEC&printsec=copyright#v=onepage&q&f=false>

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

***PAPER – VIII-A-3 : ANALYSIS OF DRUGS, FOODS, DAIRY
PRODUCTS & BIO-CHEMICAL ANALYSIS***

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1	1
03	III	1+1	1+1
04	IV	1+1	1+1
05	V	1	1

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III Year B.Sc. (VI Semester) Model Paper

Subject: CHEMISTRY

**PAPER – VIII-A-3 : ANALYSIS OF DRUGS, FOODS, DAIRY
PRODUCTS & BIO-CHEMICAL ANALYSIS**

Time:3Hrs

Marks:75

Maximum

Pass Minimum:

26

SECTION - A

Answer any **FIVE** of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any **FIVE** of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

w.e.f. 2015-16 Admitted batch(CBCS)Pattern

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
III B.Sc – CHMISTRY – SEMESTER-VI
Paper-VIII-B-1: Fuel Chemistry and Batteries

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1- PAPER-VII-B-1: FUEL CHEMISTRY AND BATTERIES
TOTAL HOURS	45 Hrs
HOURS/WEEK	3T+2P
COURSE CODE	CHE8-1-3B
COURSE TYPE	THEORY
CREDITS	3+2
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

Objectives

To understand about Review of energy sources(renewable and non-renewable), Petroleum and petrol chemical industry Fractional distillation, Petroleum and Non-Petroleum Fuels, Lubricants, Batteries

UNIT-I

12h

Review of energy sources (renewable and non-renewable) – classification of fuels and their calorific value. Coal: Uses of Coal (fuel and non-fuel) in various industries, its composition, carbonization of coal – coal gas, producer gas and water gas – composition and uses – fractionation of coal tar – uses of coal tar based chemicals, requisites of a good metallurgical coke, coal gasification (Hydro gasification and catalytic gasification) coal liquefaction .

UNIT-II

6h

Petroleum and petrol chemical industry:

Composition of crude petroleum, refining and different types of petroleum products and

their applications

UNIT-III

10h

Fractional distillation (principal and process), cracking (Thermal and catalytic cracking), Reforming petroleum and non-petroleum fuels (LPG, CNG, LNG, Biogas), fuels derived from biomass, synthetic fuels (gaseous and liquids), petro chemicals, vinyl acetate, propylene oxide.

UNIT-IV

10h

Lubricants:

Classification of lubricants, lubricating oils (conducting and non-conducting), solid and semi solid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.

UNIT-V

7h

Batteries:

Primary and secondary batteries, battery components and their role, characteristics of Battery. Working of following batteries: Pb acid, Fuel cells, Solar cell and polymer cell.

Additional Syllabus:

Coal tar distillation with excess matter, solvent refining.

Petrochemicals : Isoprene, butadiene and toluene

REFERENCE BOOKS

1. E.Stocchi : Industrial chemistry , Vol-1, Ellis Horwood Ltd.UK.
2. P.C.Jain, M.Jain: Engineering chemistry, Dhanpat Rai & sons,Delhi.
3. B.K.Sharma: Industrial Chemistry, Goel Publishing house,Meerut.

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepQEC&printsec=copyright#v=onepage&q&f=false>

Course Outcomes:

At the end of the course, the students will be able to;

CO-1 : Understand the basic concepts of various industrial applications, compositions and uses of coal tar in metallurgy.

CO-2 : Understand the basic concepts of types of petroleum products and refining techniques.

CO-3 : Understand the basic concepts of LPC, CNG, LNG biogas fuels derived from biomass

CO-4 :Understand the basic concepts of solid and semi solid lubricants, viscosity index ,cloud point, pour point and their determinations.

CO-5 : Understand the basic concepts of battery components and their rolls, characteristics of batteries.

Programme specific Outcomes:

PSO -1 :Review of energy sources(renewable and non-renewable):

To gain knowledge about the basic concepts of various industrial applications, composition sand uses of coal tar in metallurgy.

PSO -2 :Petroleum and petro chemical industry:

To gain knowledge about Understand the basic concepts of types of petroleum products and refining techniques

PSO -3 :Fractional distillation, Petroleum and Non-Petroleum Fuels:

To gain knowledge about the LPC,CNG, LNG biogas fuels derived from biomass

PSO -4 :Lubricants:

To gain knowledge about the solid and semi solid lubricants, viscosity index ,cloud point, pour point and their determinations.

PSO -5 :Batteries:

To gain knowledge about the battery components and their rolls, characteristics of batteries

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

Paper-VIII-B-1: Fuel Chemistry and Batteries

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1	1
03	III	1+1	1+1
04	IV	1+1	1+1
05	V	1	1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
III Year B.Sc. (VI Semester) Model Paper
Subject: **CHEMISTRY**
Paper-VIII-B-1: Fuel Chemistry and Batteries

Time:3Hrs
Marks:75

Maximum

Pass Minimum:

26

SECTION - A

Answer any **FIVE** of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any **FIVE** of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-B-2 : INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

45hrs (3 h/w)

COURSE TITLE	AJOR CORE 1-PAPER – VIII-B-2 : INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE
TOTAL HOURS	45 Hrs
HOURS/WEEK	3 T+2P
COURSE CODE	CHE8-2-3B
COURSE TYPE	THEORY
CREDITS	3+2
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

Objectives

To understand about Recapitulation of s- and p-Block Elements, Silicate Industries, Fertilizers, Polymers, Alloys, Chemical explosives

UNIT-I

9 h

Recapitulation of s- and p-Block Elements.

Periodicity of s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy – factors effecting ionization enthalpy, electronegativity – estimation of electronegativity by Pauling, Mulliken and Alfred – Rochow scales. Allotropy, allotropes of C, S, and P. Oxidation states, inert pair effect, diagonal relationship and anomalous behaviour of first member of each group.

UNIT- II

8 h

Silicate Industries

Glass: Glassy state and its properties, classification. Manufacturing and processing of glass. Composition and properties of the following types of glasses - Soda lime glass, lead glass, safety glass, Boro silicate glass, coloured glass and Photo sensitive glass

Cement : Classification of cement, ingredients and their role, Manufacture of cement and the setting process.

UNIT -III

9 h

Fertilizers: Definition, classification of fertilizers. Manufacture of the following fertilizers Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphate, polyphosphate and superphosphate of lime. Compound and mixed fertilizers, potassium chloride, potassium sulphate.

UNIT-IV

10h

Polymers : Definition, classification of polymers. Molecular weight of polymers – number average

and weight average molecular weights. Determination of molecular weight of polymers by Osmometry.

Polymers and their applications – Preparation and industrial applications of polyethylene, poly vinyl chloride, Teflon, poly acrylo nitrile, Terelene and Nylon-6,6.

UNIT -V

9 h

Alloys: Definition Classification of alloys, ferrous and non-ferrous alloys – Examples. Manufacture of Steel. Composition and significance of different types of Steels – Heat resisting steel, stainless steel, spring steel and tool steel.

Chemical explosives: Definition and characteristics of explosives. Preparation and significance of lead azide, PETN, Cyclonite (RDX). Introduction to Rocket propellents.

Additional Syllabus: Ceramics: Important clays and feldspar, ceramics, their types and manufacture. High technology ceramics and their applications.

REFERENCE BOOKS

1. E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd.UK.
2. R. M. Felder, R. W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
3. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: Introduction to Ceramics, Wiley Publishers, New Delhi.
4. J. A. Kent: Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
5. P. C. Jain & M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
6. R. Gopalan, D. Venkappayya, S. Nagarajan: Engineering Chemistry, Vikas Publications, New Delhi.
B. K. Sharma: Engineering Chemistry, Goel Publishing House, Meerut.

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepQEC&printsec=copyright#v=onepage&q&f=false>

Course Outcomes:

At the end of the course, the students will be able to;

CO-1 : Understand the basic concepts of Electronic configuration, atomic size, ionisation enthalpy, diagonal relationship

CO-2 : Understand the basic concepts of composition and properties of glasses and

manufacture of cement.

CO-3 : Understand the basic concepts of super phosphate of lime, compound and mixed fertilizers

CO-4 : Understand the basic concepts of polymer application, industrial applications and preparation, uses of PVC, nylon

CO-5 : Understand the basic concepts of composition of different types of alloys ,stainless steels, tool steel uses. Rocket

Programme specific Outcomes:

PSO-1 : Recapitulation of s- and p-Block Elements:

To gain knowledge on Electronic configuration, atomic size, ionisation enthalpy ,diagonal relationship

PSO-2 : Silicate industries:

To gain knowledge about the composition and properties of glasses and manufacture of cement.

PSO-3 :Fertilizers:

To gain knowledge on of composition of different types of alloys ,stainless steels, tool steel uses. rocket

PSO-4 :Surface Coatings:

To gain knowledge on of polymer application, industrial applications and preparation, uses of PVC, nylon

PSO-5 : Alloys:

To gain knowledge on composition and properties of glasses and manufacture of copellents.

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-B-2 : INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1
02	II	1	1+1
03	III	1+1	1
04	IV	1+1	1+1
05	V	1	1+1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III Year B.Sc. (VI Semester) Model Paper
Subject: **CHEMISTRY**

PAPER – VIII-B-2 : INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

Time:3Hrs

Marks:75

Maximum

Pass Minimum:

26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-B-3 : ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1-PAPER – VIII-B-3 : : I ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS
TOTAL HOURS	45 Hrs
HOURS/WEEK	3T+2P
COURSE CODE	CHE8-3-3B
COURSE TYPE	THEORY
CREDITS	3+2
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

Objectives:

To understand about Analysis of soaps, Analysis of oils, Analysis of Fertilizers, Gas analysis, Separation techniques.

UNIT-I

9 h

Analysis of **soaps** :moisture and volatile matter, combined alkali, total fatty matter, free alkali and total fatty acid.
Analysis of **paints** : Vehicle and pigments, Barium Sulphate, total lead and lead chromate.

UNIT- II

8 h

Analysis of oils : saponification value, iodine value and acid value.
Analysis of fertilizers : Determination of ammonia in ammonical fertilizers, determination of nitrogen in **nitrate fertilizers** and determination of phosphorous in phosphate fertilizers.

UNIT -III

9 h

Gas analysis: carbon dioxide, carbon monoxide, oxygen, hydrogen, and nitrogen.
Analysis of Fuel gases like: water gas and producer gas.
Ultimate analysis : carbon, hydrogen, nitrogen, oxygen, phosphorus and sulphur.

UNIT-IV

9 h

SOLVENT EXTRACTION :Introduction, principle, distribution law, factors affecting solvent extraction, types of solvent extraction techniques - Batch extraction, continuous extraction and counter current extraction. Application - Determination of Iron (III)

CHROMATOGRAPHY :Classification of **chromatographic methods**, principles of differential migration

adsorption phenomenon, R_f values, factors effecting R_f values

PAPER CHROMATOGRAPHY :Principles, R_f values, experimental procedures, choice of paper and solvent systems, development of chromatogram - ascending, descending and radial. Two dimensional chromatography, applications.

UNIT -V

10h

THIN LAYER CHROMATOGRAPHY Advantages, Principles, factors effecting R_f values. Experimental procedure, Adsorbents and solvents. Preparation of plates, development of chromatogram, detection of the spots. Applications.

COLUMN CHROMATOGRAPHY Principles, experimental procedures, Stationary and mobile Phases, Separation technique. Applications.

HPLC :Basic principles and applications.

Additional Syllabus: Analysis of cement- loss on ignition, insoluble residue, total silica, sesqui oxides, lime, magnesia, ferric oxide.

REFERENCE BOOKS

1. F.J.Welcher - Standard methods of analysis.
2. A.I.Vogel - A text book of quantitative Inorganic analysis - ELBS.
3. H.H.Willard and H.Deal - Advanced quantitative analysis - Van NostrandCo.
4. F.D.Snell & F.M.Biffen - Commercial methods of analysis - D.B.Taraporavala &sons.
5. J.J.Elving and I.M.Kolthoff - Chemical analysis - A series of monographs on analytical chemistry and its applications - Inter Science Vol I toVII.
6. G.Z.Weig - Analytical methods for pesticides, plant growth regulators and food additives - Vols I toVII.
7. S.L.Chopra & J.S.Kanwar - Aanalytical Agricultrual Chemistry - KalyaniPublishers.
8. R.M.Upadhyay and N.L. Sharma - Manual of soil, plant, water and fertilizer analysis - KalyaniPublishers.

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepQEC&printsec=copyright#v=onepage&q&f=false>

Course Outcomes:

At the end of the course, the students will be able to;

CO-1 :Understand the basic concepts of constituents of soaps and paints and analysis of soaps and paints

CO-2 :Understand the basic concepts of constituents oils and fertilizers and analysis of oils and fertilizers.

CO-3 :Understand the basic concepts of mixture of gases present in fuel gases and coal gas and their analysis

CO-4 :Understand the basic concepts of different separation techniques of solvent extraction

CO-5 :Understand the basic concepts of separation techniques of column and chromatography ,Thin layer chromatography, And HPLC ,Applications of these techniques in different industries.

Programme specific Outcomes:

PSO-1 :Analysis of soaps :

To gain knowledge about the constituents of soaps and paints and analysis of soaps and paints

PSO- 2 :Analysis of oils :

To gain knowledge about the constituents oils and fertilizers and analysis of oils and fertilizers.

PSO- 3 :Analysis of Fertilizers:

To gain knowledge about the mixture of gases present in fuel gases and coal gas and their analysis

PSO-4 :Gas analysis :

To gain knowledge about the different separation techniques of solvent extraction

PSO-5 :Separation techniques:

To gain knowledge about separation techniques of column and chromatography, Thin layer chromatography, And HPLC. Applications of these techniques in different industries

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-B-3 : ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1	1
03	III	1+1	1
04	IV	1+1	1+1
05	V	1	1+1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-B-3 : ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS

Time:3Hrs

Maximum Marks:75

Pass Minimum: 26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-C-1 : ORGANIC SPECTROSCOPIC TECHNIQUES

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1 ORGANIC SPECTROSCOPIC TECHNIQUES
TOTAL HOURS	45 Hrs
HOURS/WEEK	3T+2P
COURSE CODE	CHE-1A
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

UNIT-I

10 h

Nuclear Magnetic Resonance Spectroscopy

Nuclear spin, Principles of NMR - Classical and Quantum Mechanical methods, Magnetic moment and Spin angular momentum. Larmor Frequency. Instrumentation. Relaxation - spin-spin & spin lattice relaxation.

Shielding constants, Chemical shifts, Shielding and Deshielding mechanism - Factors influencing Chemical shift. Spin-Spin interactions - AX, AX₂ and AB types, factors influencing coupling constant.

UNIT- II

5 h

Spin decoupling, Spin tickling, Deuterium exchange, Chemical shift reagents and Nuclear Overhauser effect. Applications in Medical diagnostics, FT NMR and its advantages.

UNIT-III

10h

UV & Visible Spectroscopy

Electronic spectra of diatomic molecules. The Born-Oppenheimer approximation. Vibrational coarse structure: Bond association and Bond sequence. Intensity of Vibrational - electronic spectra: The Franck-Condon principle. Rotational fine structure of electronic vibration transitions. Electronic structure of diatomic molecules. Types of transitions, Chromophores, Conjugated dienes, trienes and polyenes, unsaturated carbonyl compounds - Woodward-Fieser rules.

UNIT-IV

5 h

Electronic spectra of polyatomic molecules. Chemical analysis by Electronic Spectroscopy – Beer-Lambert's Law. Deviation from Beer's law. Quantitative determination of metal ions (Mn²⁺, Fe²⁺, NO⁻, Pb²⁺). Simultaneous determination of Chromium and Manganese in a mixture.

Electron Spin Resonance Spectroscopy

Basic Principles, Theory of ESR, Comparison of NMR & ESR. Instrumentation, Factors affecting the 'g' value, determination of 'g' value. Isotropic and Anisotropic constants. Splitting hyperfine splitting coupling constants. Linewidth, Zero field splitting and Kramer degeneracy. Crystal field splitting, Crystal field effects. Applications:- Detection of free radicals - ESR spectra of Methyl radical ($\text{CH}_3\cdot$), Benzene anion (C_6H_6^-).

REFERENCE BOOKS

1. Electron Spin Resonance Elementary Theory and Practical Applications - John E. Wertz and James R. Bolton, Chapman and Hall, 1986.
2. Spectroscopic Identification of organic compounds – Silverstein, Basseler and Morrill.
3. Organic Spectroscopy - William Kemp.
4. Fundamentals of Molecular Spectroscopy - C.N. Banwell and E.A. Mc cash 4th Edition, Tata Mc Graw Hill Publishing Co., Ltd. 1994.
5. Physical Methods in Inorganic Chemistry – R.S. Drago, Saunders Publications.
6. Application of Mössbauer Spectroscopy – Green Mood.
7. NMR, NQR, EPR and Mössbauer Spectroscopy in inorganic chemistry – R.V. Parish, Ellis, Harwood.
8. Instrumental Methods of Chemical Analysis - H. Kaur, Pragathi Prakashan, 2003.
9. Instrumental Methods of Analysis, 7th Edition – Willard, Merrit, Dean, Settle, CBS Publications, 1986.
10. Molecular Structure and Spectroscopy – G. Aruldas, Prentice Hall of India Pvt. Ltd, New Delhi, 2001.
11. Mössbauer Spectroscopy – N.N. Green Wood and T.C. Gibb, Chapman and Hall, Landon 1971.
12. Coordination Chemistry: Experimental Methods - K. Burger, London Butter Worths, 1973.
13. Analytical spectroscopy – Kamlesh Bansal, Campus books, 2008.
14. Structural Inorganic Chemistry Mössbauer Spectroscopy – Bhide.
15. Principle of Mössbauer Spectroscopy – T.C. Gibb, Chapman and Hall, Landon 1976.

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y

2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepQEC&printsec=copyright#v=onepage&q&f=false>

SIR C R REDDY COLLEGE, ELURU

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-C-1 : ORGANIC SPECTROSCOPIC TECHNIQUES

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1	1
03	III	1+1	1
04	IV	1	1+1
05	V	1+1	1+1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)
III Year B.Sc. (VI Semester) Model Paper
Subject: **CHEMISTRY**
PAPER – VIII-C-1 : ORGANIC SPECTROSCOPIC TECHNIQUES

Time:3Hrs

Maximum Marks:75
Pass Minimum: 26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-C-2 : ADVANCED ORGANIC REACTIONS

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1 ADVANCED ORGANIC REACTIONS
TOTAL HOURS	45 Hrs
HOURS/WEEK	3T+2P
COURSE CODE	CHE-1A
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

UNIT – I

Organic Photochemistry

8 h

Organic photochemistry: Molecular orbitals, carbonyl chromophore–triplet states, Jablonski diagram, inter-system crossing. Energy transfer. Energies properties and reaction of singlet and triplet states of and transitions. Photochemical reactions : (a) Photoreduction, mechanism, influence of temperature, solvent, nature of hydrogen donors, structure of substrates on the course of photoreduction.

UNIT – II

Organic Photochemistry

8 h

Norrish cleavages, type I: Mechanism, acyclic cyclic diones, influence of sensitizer, photo Fries rearrangement. Norrish type II cleavage: Mechanism and stereochemistry, type II reactions of esters: 1: 2 diketones, photo decarboxylation, Di - π methane rearrangement.

UNIT – III

Protecting Groups and Organic Reactions

9 h

Principles of (1) Protection of alcohols – ether formation including silyl ethers – ester formation, (2) Protection of diols – acetal, ketal and carbonate formation, (3) Protection of carboxylic acids – ester formation, benzyl and t-butyl esters, (4) Protection of amines – acetylation, benzoylation (5) protection of carbonyl groups – acetal and ketal formation.

UNIT- IV

8 h

Synthetic reactions: Mannich reaction – Mannich bases – Robinson annulations. The Shapiro reaction, Stork–enamine reaction. Use of dithioacetals – Umpolung, Phase transfer catalysis - Wittig reaction.

UNIT -V :

New Synthetic Reactions

12 h

Baylis–Hillman reaction, Mukayama aldol reaction, Heck reaction, Suzuki coupling, Stille coupling, Sonogashira coupling, Buchwald–Hartwig coupling, Ugi reaction, Click reaction.

REFERENCE BOOKS

1. Molecular reactions and Photochemistry by Charles Dupey and O.L.Chapman.
2. Molecular Photochemistry by Turru.
3. Importance of antibonding orbitals by Jaffe and Orchin.
4. Text Book of Organic Chemistry by Cram, Hammand and Henrickson.
5. Some modern methods of organic synthesis by W.Carruthers.
6. Guide Book to Organic Synthesis by R.K. Meckie, D.M. Smith and R.A. Atken.
7. Organic Synthesis by O.House.
8. Organic synthesis by Michael B.Smith.
9. Organic Chemistry Claydon and others 2005.
10. Name Reactions by Jie Jack Li
11. Reagents in Organic synthesis by B.P. Mundy and others.
12. Tandem Organic Reactions by Tse–Lok Ho.

Web Links:

1. https://books.google.co.in/books/about/Stereochemistry_Conformation_and_Mechani.html?id=h3SwSQwsHsYC&redir_esc=y
2. <https://www.crackchemistry.in/morrison-and-boyd-organic-chemistry-7th-edition-pdf/>
3. <https://books.google.co.in/books?id=mnsKyupepQEC&printsec=copyright#v=onepage&q&f=false>

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-C-2 : ADVANCED ORGANIC REACTION

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1+1	1
03	III	1+1	1
04	IV	1	1+1
05	V	1	1+1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-C-2 : ADVANCED ORGANIC REACTION

Time:3Hrs

Maximum Marks:75

Pass Minimum: 26

SECTION - A

Answer any FIVE of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any FIVE of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-C-3 : PHARMACEUTICAL AND MEDICINAL CHEMISTRY

45hrs (3 h/w)

COURSE TITLE	MAJOR CORE 1 PHARMACEUTICAL AND MEDICINAL CHEMISTRY
TOTAL HOURS	45 Hrs
HOURS/WEEK	3T+2P
COURSE CODE	CHE-1A
COURSE TYPE	THEORY
CREDITS	3T+2P
MARKS	75
PROGRAM CODE	5101UMPC 5503UBZC 1830UFZC 1728UMCCS

UNIT-I

8 h

Pharmaceutical chemistry Terminology: Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics (ADME, Receptors - brief treatment) Metabolites and Antimetabolites.

UNIT-II

Drugs:

8 h

Nomenclature: Chemical name, Generic name and trade names with examples, Classification: Classification based on structures and therapeutic activity with one example each, Administration of drugs.

UNIT-III

Synthesis and therapeutic activity of the compounds:

12 h

a. Chemotherapeutic Drugs

1. Sulpha drugs (Sulphamethoxazole)
2. Antibiotics - β -Lactam Antibiotics
3. Anti malarial Drugs (chloroquine)

b. Psycho therapeutic Drugs:

1. Anti pyretics (Paracetamol) 2. Hypnotics 3. Levodopa

UNIT-IV

Pharmacodynamic Drugs:

8 h

1. Antiasthma Drugs(Solbutamol)
2. Antianginals (GlycerolTrinitrate)
3. Diuretics(Frusemide)

UNIT-V

HIV-AIDS:

9 h

Immunity - CD-4cells, CD-8cells, Retro virus, Replication in human body, Investigation available, prevention of AIDS, Drugs available - examples with structures: PIS: Indinavir (crivivan), Nelfinavir(Viracept).

REFERENCE BOOKS

1. Medicinal Chemistry by Dr.B.V.Ramana
2. Synthetic Drugs by O.D.Tyagi &M.Yadav
3. Medicinal Chemistry byAshutoshkar
4. Medicinal Chemistry byP.Parimoo
5. Pharmacology & Pharmacotherapeutics R.S Satoshkar &S.D.Bhandenkar
6. Medicinal Chemistry by Kadamental P-I &P-II
EuropeanPharmacopoeia

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-C-3 : PHARMACEUTICAL AND MEDICINAL CHEMISTRY

BLUE PRINT

Kindly follow the Blue print of the syllabus strictly, while preparing the Question paper

S. No	UNIT	No. of Essay Questions	No. of Short Answer Questions
01	I	1+1	1+1
02	II	1	1+1
03	III	1+1	1
04	IV	1	1+1
05	V	1+1	1

SIR C R REDDY COLLEGE, ELURU
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

III B.Sc – CHMISTRY – SEMESTER-VI

PAPER – VIII-C-3 : PHARMACEUTICAL AND MEDICINAL CHEMISTRY

Time:3Hrs

Maximum Marks:75

Pass Minimum: 26

SECTION - A

Answer any **FIVE** of the following.

5 x 10 = 50M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer any **FIVE** of the following:

5 x 5 = 25M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

SIR C R REDDY COLLEGE

Affiliated to Adikavi Nannaya University, Rajamahendravaram

DEPARTMENT OF CHEMISTRY DEPARTMENT

MENTAL ACTION PLAN 2019-2020

S.No	Month	Week	Name of the Activity	Title of the Activity	Resource Person
1	August & September	1st Week Aug to 1st Week Sep	Value Added Course	Preparation of Surf	Department of Chemistry
2	September to February	2nd Week Sep, 2019 to 3rd Week February 2020	Certificate Course	Water Analysis (Identified Hardness, P ^H , TDS etc)	Department of Chemistry
3	September	3rd Week	Guest Lecture	Ozone layer Protection- Need of the Hour	Dr K A Emmanuel, Prof of Chemistry, Sir C R Reddy (A) College, Eluru.
4	October	1st Week	Swatcha Bharath	Arally conducted on prohibition of Plastics	Department of Chemistry
5	October	1st Week	Guest Lecture	Hetero Cyclic Compounds	Dr B JMohan Reddy, Associate Professor, AKNU, Rajamahendravaram
6	October	2nd Week	Guest Lecture	International e-waste day	Dr K Sankara Rao, District Co-ordinator, Health & Service, Eluru
7	November	3rd Week	Board of Studies	-	-
8	December	1st Week	State Level programme (World Environment day)	Environmental Protection	Dr P Srinivasa Rao, Asst Environment Engineer, AP Pollution Board, Eluru, Sri A Srinivas Rao, Inspector of Factories, Eluru
9	December to February	1st Week Dec to 1st Week Feb	Value Added Course	Preparation of Cleansing powder	Department of Chemistry
10	December	2nd Week	Field Trip to NEXGEN PV T Ltd, Bommulru	Study on Quantitative tests	Sri P Raviteja
11	January	1st Week	Carrier Orientation	What next?? After Graduation	V Nanda Kishore, Software

					Engineer, California, US A
--	--	--	--	--	-------------------------------

S.No	Month	Week	Name of the Activity	Title of the Activity	Resource Person
12	January	1st Week	Field Trip	Industrial tour to Andhra Sugars, Bhimadole	Sri KV Satyanarayana & Sri P Raviteja
13	January	3rd Week	Coaching for PG Cet	AU, AKNU and other Universities Entrance examination coaching	Department of Chemistry
14	January	4th Week	Campus Drive	Divis Laboratories	G. Sarath babu, and P. Akash, members in HR team, Divis Labs limited, Visakhapatnam.
15	February	3rd Week	Campus Drive	Smilax Laboratories	P Sunil Kumar, HRD Manager
16	February	3rd Week	Campus Drive	MSN laboratories	V Simhachalam, HRD Manager
17	February	4th Week	International Conference	Advances in Physics, Electronics and Chemical Sciences-2020	
18	July	3rd Week	VI Semester Project Work	Water Quality Parameters and HPLC Analysis	Department of Chemistry
19	December	1st Week	Invited talk	National pollution control day	R. yesodabai, IFS district forest officer
20	December	4th Week	Invited talk	Endocrine disrupting chemicals	Dr. U.V.R. vijayaradhi, principal scientist, department of analytical and structure chemistry CSIR -IICT

SIR C R REDDY COLLEGE, ELURU
VALUE ADDED COURSE OFFERED BY THE DEPARTMENT OF CHEMISTRY
EVEN (2019 – 2020)

Value added course on preparation of cleansing powder
SYLLUBUS

Credits: 2

3 hrs per a week (not included in time table)

UNIT-I

Preparation of cleansing powder

Introduction, raw materials, preparation methods, uses and applications

UNIT-II

Preparation of surf

Introduction, detergent powder manufacturing, market opportunity, raw materials uses in the preparation of surf, uses and applications

SUGGESTED LIST OF EXAMINERS / PAPER SETTERS IN CHEMISTRY

Guntur

- | | |
|------------------------|--------------------------|
| 1. Dr. P. Sridhar Babu | JKC College (Autonomous) |
| 2. Dr. M. Gowrisankar | JKC College (Autonomous) |
| 3. D. Rahul | JKC College (Autonomous) |
| 4. K. Anitha | JKC College (Autonomous) |

Bhimavaram

- | | |
|---------------------------|---------------------------|
| 1. Dr. K. Bhaskara Rao | D N R College(Autonomous) |
| 2. Dr. N. Vijaya kumar | D N R College(Autonomous) |
| 3. A.V. R. Gajapathi Raju | D N R College(Autonomous) |
| 4. V.V. Satyanarayana | D N R College(Autonomous) |

Vijayawada

- | | |
|--------------------------|------------------------------------|
| 1. Dr. K. Rayapa Reddy | ANDHRA LOYALA COLLEGE (Autonomous) |
| 2. Dr. Bala Karuna Kumar | ANDHRA LOYALA COLLEGE (Autonomous) |
| 3.Mr. K. T. S. S. Raju | ANDHRA LOYALA COLLEGE (Autonomous) |
| 4.Mrs. P. Anila | ANDHRA LOYALA COLLEGE (Autonomous) |

Narasapuram

- | | |
|-------------------|-------------------------|
| 1. Dr.S.B. Ronald | Y N College(Autonomous) |
|-------------------|-------------------------|

2. Dr.B. Anand Kumar Y N College(Autonomous)
3. Ch.Uday kumar Y N College(Autonomous)
4. Ch.R.V.R.Prasad Y N College(Autonomous)