




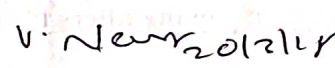

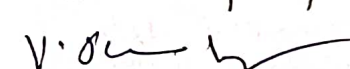




SRR & CVR GOVT DEGREE COLLEGE (A), VIJAYAWADA
DEPARTEMENT OF CHEMISTRY

Minutes of the meeting of the Board of studies in the subject of Chemistry for III & IV semester

The meeting of the Board of studies in the subject of Chemistry for III(& IV semesters was held of 16th March 2018 in the Department o Chemistry , SRR & CVR Govt. Degree College (A), Vijayawada.

The following members attended the meeting :

- | | | |
|----------------------------|---------------------------------------|--|
| 1. K.Srinivas | Incharge of the Dept & Chairman , BOS |  20/3/18 |
| 2. Dr.D.Rama Sekhar Reddy | University Nominee |  20-3-18 |
| 3. Dr.Md. Pacha | Subject expert |  |
| 4.Dr.V.Sambasiva Rao | Subject expert |  |
| 5. B.V.Ramesh | Subject expert |  |
| 6. Dr.G.Venkatarao | Faculty Member | |
| 7 .Dr.V.Neeraja | Faculty Member |  V. Neeraja 20/3/18 |
| 8 .Dr.G.Nagarjuna | Faculty Member |  |
| 9. Dr.V.Phani Kumar | Faculty Member |  V. Phani Kumar |
| 10. K.V.S Prasad | Faculty Member |  20-3-18 |
| 11. G.V.Swaroop Singh | Faculty Member |  20/3/18 |

AGENDA:

Item. 1 :Approval of syllabus for Semester III & IV for the academic year 2018-2019

Item 2 :Approval of Question Paper , blue print and model paper

Item 3 :Approval of list of paper setters and examiners

Item 4 : Any other item with the approval of the chair

The Chairperson , Board of Studies welcomed the members and initiated discussion on the syllabus for III & IV semesters. He apprised the members of the guidelines of the UGC and the CCE regarding the framing of syllabus and the recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following :

Resolutions :

1. Resolved to adopt the present University CBCS syllabus for semester II and IV with the suggested modifications
2. Resolved to approve the division of marks for internal and external examinations along with the suggested blue print and model paper
3. Resolved to approve the list of paper setters and examiners submitted by the department

Syllabus for CBCS semester III

Question paper blue print for CBCS semester III

Model question paper for CBCS semester III


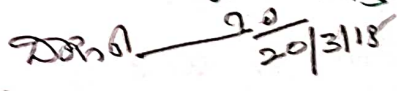







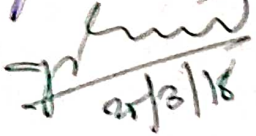
Syllabus for CBCS semester IV

Question paper blue print for CBCS semester IV

Model question paper for CBCS semester IV

List of paper setters and examiners

Signatures of the members of the BOS :

- | | | |
|----------------------------|---------------------------------------|---|
| 1. K.Srinivas | Incharge of the Dept & Chairman , BOS |  |
| 2. Dr.D.Rama Sekhar Reddy | University Nominee |  |
| 3. Dr.Md. Pacha | Subject expert |  |
| 4.Dr.V.Sambasiva Rao | Subject expert |  |
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| 6. Dr.G.Venkatarao | Faculty Member | |
| 7 .Dr.V.Neeraja | Faculty Member |  |
| 8 .Dr.G.Nagarjuna | Faculty Member |  |
| 9. Dr.V.Phani Kumar | Faculty Member |  |
| 10. K.V.S Prasad | Faculty Member |  |
| 11. G.V.Swaroop Singh | Faculty Member |  |

SRR & CVR GOVT.DEGREE COLLEGE
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VIJAYAWADA

Chemistry Syllabus (From 2018-2019)

SEMESTER - III

Paper III (INORGANIC & ORGANIC CHEMISTRY)

60 hrs (4 h / w)

INORGANIC CHEMISTRY

30 hrs (2h / w)

UNIT -I

1. Chemistry of d-block elements:

9h

Characteristics of d-block elements with special reference to electronic configuration, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states

2. Theories of bonding in metals:

6h

Metallic properties, Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors and insulators.

UNIT - II

3. Metal carbonyls :

7h

EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni.

4. Chemistry of f-block elements:

8h

Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.

ORGANIC CHEMISTRY

30 h (2h/w)

UNIT - III

1. Halogen compounds

5 h

Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, aryl alkyl, allyl, vinyl, benzyl halides.

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UNIT-IV

10 h

Oxidation of aldehydes-Baeyer-Villiger oxidation of ketones.Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with LiAlH_4 and NaBH_4 . Analysis of aldehydes and ketones with a) 2,4-DNPH test, b) Tollen's test, c) Fehling test d) Schiff's test e) Haloform test (with equation)

UNIT-V

6 h

Chemical properties: Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schimdt reaction, Arndt-Eistert synthesis, halogenation by Hell-Volhard- Zelinsky reaction.

4 h

d) Reaction with urea.

d) Reaction with urea.

List of Reference Books

1. Selected topics in Inorganic Chemistry by W.D.Malik, G.D.Tuli, R.D.Madan
2. Inorganic Chemistry J E Huheey, E A Keiter and R L Keiter
3. A Text Book of Organic Chemistry by Bahl and Arun bahl
4. A Text Book of Organic chemistry by I L Finar Vol I
5. Organic chemistry by Bruice
6. Organic chemistry by Clayden
7. Advanced Inorganic Chemistry by Gurudeep Raj
8. Basic Inorganic Chemistry by Cotton and Wilkinson
9. Concise Inorganic Chemistry by J.D.Lee

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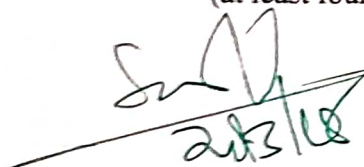
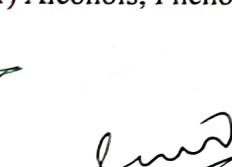
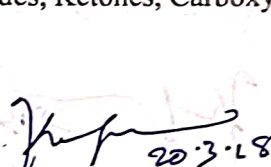
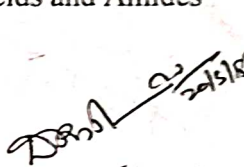
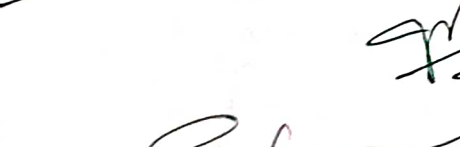
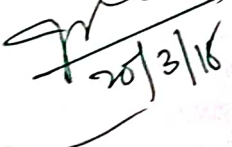
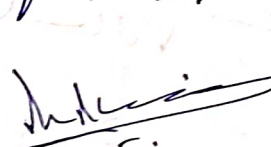
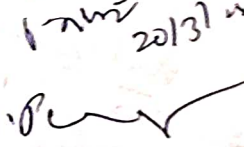
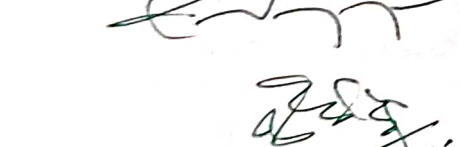



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(At the end of Semester-III)

25M

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VIJAYAWADA

SEMESTER - III

Paper III (INORGANIC & ORGANIC CHEMISTRY)

Weightage to Content

| UNIT NUMBER | NAME OF THE CHAPTER | Essay (10M) | Short (5M) |
|-------------|---------------------------------|-------------|------------|
| UNIT-I | Chemistry of d - block elements | 1 | 1 |
| | Theories of bonding in metals | 1 | 1 |
| UNIT-II | Metal Carbonyls | 1 | 1 |
| | Chemistry of f-block elements | 1 | 1 |
| UNIT-III | Halogen Compounds | 2 | 2 |
| UNIT-IV | Carbonyl Compounds | 2 | 2 |
| UNIT- V | Carboxylic acid & derivatives | 1 | 1 |
| | Active methylene compounds | 1 | 1 |

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12. A) What is meant by lanthanide contraction? Explain the cause and the consequences of lanthanide contraction?

OR

B) What are metal carbonyls? Explain the classification of metal carbonyls with examples.

13. A) Discuss the mechanism and stereochemistry of SN^1 and SN^2 reactions with suitable examples

OR

B) Write the differences between SN^1 and SN^2 reactions and explain the the energy profile diagrams of SN^1 and SN^2 reactions

14. A) Explain the following mechanisms. i) Cannizzaro's reaction ii) Perkin's reaction

OR

B) Write the mechanism of i) Haloform reaction ii) Benzoin condensation

15. A) i) Explain the mechanism of hydrolysis of esters in acid medium with suitable example.
ii) Hunsdiecker reaction.

OR

B) Write the mechanism of Claisen Condensation.

How the following compounds are prepared from Aceto acitic ester

i) Methyl isopropyl ketone ii)) propanoic acid

i) Methyl isopropyl ketone ii) propanoic acid

Paper IV (SPECTROSCOPY & PHYSICAL CHEMISTRY)

60 hr/w (4 h / w)

SPECTROSCOPY

30 hrs (2h / w)

UNIT-I

6h

General features of absorption - 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 molecules effect of conjugation. Concept of chromophore and auxochrome.

UNIT-II

Infra red spectroscopy

8h

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, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

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. Osmosis, osmotic pressure, experimental determination. Determination of molecular weight of non-volatile solute from osmotic pressure. Abnormal Colligative properties- Van't Hoff factor.

Abnormal Colligative properties- Van't Hoff factor.

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Electrochemistry-I

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 Hittorff's method. Application of conductivity measurements- conductometric titrations.

1. Electrochemistry-II

Single electrode potential, sign convention, Reversible and irreversible cells
Nernst Equation- Reference electrode, Standard Hydrogen electrode, calomel electrode, metal – metal ion electrode, Inert electrode, Determination of EMF of cell, Applications of EMF measurements - Potentiometric titrations.

6h

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

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

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LABORATORY COURSE – IV

Practical Paper – IV

Physical Chemistry and IR Spectral Analysis

(at the end of semester IV)

30 hrs (2 h / W)

Physical Chemistry

25M

- ### 1.Critical Solution Temperature- Phenol-Water system

2. Determination of concentration of HCl conductometrically using standard NaOH solution.

3. Determination of concentration of acetic acid conductometrically using standard NaOH Solution.

4. Determination of concentration of acetic acid conductometrically using standard NaOH Solution.

IR Spectral Analysis

25

- #### 4. IR Spectral Analysis of the following functional groups with examples

- a) Hydroxyl groups

b) Carbonyl groups

c) Amino groups

d) Aromatic groups

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(Spectroscopy and Physical Chemistry)

II Year – IV Semester

| UNIT NUMBER | NAME OF THE CHAPTER | Essay (10M) | Short (5M) |
|-------------|--|-------------|------------|
| UNIT-I | Spectroscopy General features | 1 | 1 |
| | Electronic Spectroscopy | 1 | 1 |
| UNIT- II | Infrared Spectroscopy | 1 | 1 |
| | Proton Magnetic Resonance Spectroscopy | 1 | 1 |
| UNIT- III | Dilute solutions | 2 | 2 |
| UNIT- IV | Electrochemistry -I | 2 | 2 |
| UNIT -V | Electrochemistry - II | 1 | 1 |
| | Phase rule | 1 | 1 |

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S.R.R. & C.V.R. GOVT. DEGREE COLLEGE (A), VIJAYAWADA

II B. Sc CHEMISTRY

SEMESTER - IV

SEM END EXAMINATIONS

Spectroscopy and Physical Chemistry

MODEL PAPER

Time : 3 hrs

Max. Marks : 60

SECTION - A

Answer any FIVE of the following Short Answer Questions.

5 x 4 = 20 Marks

1. Explain Absorbance and Molar Absorptivity.
2. Write briefly about Chromophore and Auxochrome with examples.
3. Write about Finger Print Region in IR Spectroscopy.
4. What is shielding and de-shielding in NMR Spectroscopy.
5. Write about Abnormal Colligative properties.
6. What are Colligative properties and Define Roul't's Law.
7. Write Kohlarusch law and give any one of its application.
8. Explain Ostwald Dilution Law.
9. Write about Hydrogen Electrode.
10. Explain about freezing mixtures.

SECTION - B

Answer all FIVE Questions.

5 x 8 = 40 Marks

11. A) Explain Beer-Lambert Law. How do you estimate the amount of Chromium in Potassium Dichromate Spectrophotometrically.

OR

- B) Explain different types of Electronic Transitions in U.V. Spectroscopy.

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12. A) Write the Principle of IR Spectroscopy and explain different types modes of Vibrations in a molecule.

OR

B) Discuss the Principle involved in the NM Spectroscopy and explain the NMR Spectrums of Ethyl alcohol and Acetophenone.

13. A) What is meant by Elevation in Boiling Point? Derive the relationship between Elevation in Boiling Point and the Molecular Weight of the Solute.

OR

B) What is Osmotic Pressure? Describe one method of determination of Osmotic Pressure of a dilute solution.

14. A) Discuss the theory of Strong Electrolytes. And explain the Debye-Huckel and onsagar's equation

OR

B) Explain different types of Conductometric titrations.

15. A) Explain different types of Potentiometric Titrations

OR

B) What is Phase Rule. Explain Phase equilibrium of Water system.

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