MODEL PAPER
SECOND YEAR B.Sc., DEGREE EXAMINATION
SEMESTER-III
CHEMISTRY COURSE-III: ORGANIC CHEMISTRY & SPECTROSCOPY

Time: 3 hours Maximum Marks: 75

PART - A

Answer any FIVE of the following questions. Each carries FIVE marks 5 X 5 = 25 Marks

1. Discuss any two methods for the preparation of aryI halides.
   అర్యి హాలైడ్స్ తయారీకు రెండు విధానాలు తెలియండి.

2. Explain the mechanism for Pinacol-Pinacolone rearrangement.
   పినాకొల్-పినాకొలోన్ రెంటరైంగ్ మైదానం సాధనం సాగించండి.

3. Discuss the mechanism for Baeyer-villiger oxidation reaction.
   బాయేర్-విలీగర్ రోగ్నేషన్ రచనా సాధనం సాగించండి.

4. Explain the effect of substituents on acidic strength of mono-carboxylic acids.
   విభిన్న సహాయాలు ఒక్కొక కార్బోసైడ్కు రక్షణను ప్రదాయిస్తాయి?

5. Explain the mechanism for Claisen Condensation reaction.
   క్లైసన్ కండెన్సేషన్ రచనా రాణ సాగించండి.

6. Write the selection rules in rotational spectroscopy.
   నిర్ధారణ నాటికి నుండి నిర్ధారణ నాటికి సిద్ధాంతం పండించండి.

7. Explain Spin – Spin coupling and Coupling Constant.
   స్పిన్ – స్పిన్ కుప్పింగ్ మరియు కూపింగ్ కంసటెంట్.

8. Explain the types of electronic transitions in UV spectroscopy.
   UV ఎన్నికల్ జట్టులు నడపడే విధానాలు సాగించండి.

PART - B

Answer ALL the questions. Each carries TEN marks 5 X 10 = 50 Marks

9(a) Explain the mechanism & stereochemistry of SN1 & SN2 reactions of alkyl halides with suitable examples.
   అక్యుల హాలైడ్స్ తయారీలో SN1 & SN2 రాకు ప్రదానం సాధనం సాగించండి సాధనం సాగించండి.

   (or)

(b) Explain the following reactions with mechanisms.
   (i) Reimer-Tiemann reaction (ii) Fries rearrangement
   రెంమర్-తియమ్నం రాకు (ii) ఫ్రెస్ రెంటరైంగ్

9(b) Explain the following reactions with mechanisms.
   (i) Perkin reaction (ii) Cannizaro reaction
   (i) పెర్కన్ రాకు (ii) కాన్నిసారో రాకు
11(a). Explain acid and base hydrolysis reactions of esters with mechanisms.

(b). Explain the mechanisms of Curtius rearrangement & Arndt–Eistert reaction.


(b). Discuss the principle of NMR spectroscopy.

13(a). Write Woodward-Fieser rules for calculating \( \lambda_{\text{max}} \) value for conjugated dienes and \( \alpha,\beta \)-unsaturated carbonyl compounds by taking one example for each.

(b). (i) What is the Fingerprint region? Explain its significance with an example.

(ii) Write IR spectral data for any one aldehyde and ketone

(i) 4-Phenyl 3-Pentanone

(ii) Benzaldehyde 3-Phenyl 3-Pentanone
MODEL PAPER
SECOND YEAR B.Sc., DEGREE EXAMINATION
SEMESTER-IV
CHEMISTRY COURSE -IV: INORGANIC, ORGANIC & PHYSICAL CHEMISTRY

Time: 3 hours
Maximum Marks: 75

PART- A

Answer any FIVE of the following questions. Each carries FIVE marks
5 X 5 = 25 Marks

1. Describe the 18 electron rule for mononuclear and polynuclear metal carbonyls with suitable examples.

2. What are epimers and anomers? Give examples.

3. Discuss isoelectric point and zwitterion.

4. Discuss the Paul-Knorr synthesis of heterocyclic compounds.

5. Explain Tautomerism shown by nitro alkanes.

6. Discuss the basic nature of amines.

7. Write the differences between thermal and photochemical reactions.

8. Define heat capacities and derive \( C_p - C_v = R \).

PART- B

Answer ALL the questions. Each carries TEN marks
5 X 10 = 50 Marks

9 (a). What are organometallic compounds? Write their classification on the basis of type of bonds with examples.

(b). Discuss the general methods of preparations of mono & bi-nuclear carbonyls of 3d-series.

10 (a). Discuss the ring structure and ring size of glucose. Draw the Haworth structure of glucose.
(b). (i) Explain Ruff's degradation.
(ii) Explain Kiliain- Fischer synthesis.


Discuss the aromatic character of Furan, Thiophene and Pyrrole.

12(a). Write the mechanism for the following:
   (i) Nef reaction  (ii) Mannich reaction
   (i)  (ii)  

(b) (i) Explain Hinsberg separation of amines.
(ii) Discuss any three synthetic applications of diazonium salts.

13(a). What is quantum yield? Explain the photochemical combinations of Hydrogen- Chlorine and Hydrogen - Bromine.

(b). Define entropy. Describe entropy changes in the reversible and irreversible processes.

*** (All the Best) ***

Smt. D. Prasanna
(Member)

(Dr. A. Ram Gopal)
BoS Chairman
UG_Cheistry
Andhra University
MODEL PAPER
SECOND YEAR B.Sc., DEREEXAMINATION
SEMESTER-IV
CHEMISTRY COURSE V: INORGANIC & PHYSICAL CHEMISTRY

Time: 3 hours
Maximum Marks: 75

PART-A

Answer any FIVE of the following questions. Each carries FIVE marks 5 X 5 = 25 Marks

1. Write a short note on Jahn-Teller theorem.
2. Explain Labile and inert complexes.
3. Explain Job's method for the determination of composition of complexes.
4. Explain Gibb's phase rule.
5. Explain any two conductometric titrations.
6. Write a short note on Fuel Cells with examples and applications.
7. What is enzyme catalysis? Specify any three factors affecting enzyme catalysis.

PART-B

Answer ALL the questions. Each carries TEN marks 5 X 10 = 50 Marks

8. (a). Explain Valence Bond Theory (VBT) in terms of Inner and Outer orbital complexes. Write the limitations of VBT.
     (b). Define CFSE. Explain the factors affecting the magnitude of crystal field splitting energy.

9. (a). Explain Trans effect. Explain the theories of trans effect. Write any two applications of trans effect.
(b. (i) Write the biological functions of Haemoglobin and Myoglobin.
(ii) Write a note on the use of chelating agents in medicines.
(iii) Write a note on the use of complex formation in analytical chemistry.
(iv) Explain the process of sedimentation in analytical chemistry.

10. (a) Explain phase diagram of Pb–Ag system.
(b) Explain phase diagram for NaCl-water system.

11. (a) Define Transport number. Explain the experimental method for the determination of transport number by Hittorf method.
(b) State and explain Kohlrausch's law. Write about its applications.

12. (a) Explain any two methods for the determination of order of a reaction.
(b) Derive Michaelis-Menten equation.

*** (All the Best) ***

(Dr. A. Ram Gopal)
BoS Chairman
UG Chemistry
Andhra University