GOVERNMENT COLLEGE (A), RAJAMAHENDRAVARAM

II B.Sc. CHEMISTRY (Hons.) SEMESTER–III 2024-25

CHEMISTRY COURSE-5: ORGANIC CHEMISTRY-I

MODEL QUESTION PAPER

TIME: $2^1/_2$ hrs. **MAX. MARKS: 50**

PART – A

Answer **ALL** the following questions. **5x7 = 35 M**

		Marks	BL	CLO	PLO	PI
1a)	What is inductive effect? Explain its aplications *OR*	*7*	*2*	*1*	*1*	
1b)	Explain types of organic reactions with examples	*7*	*2*	*2*	*2*	
2a)	Explain the preparation methods and chemical properties of alkenes *OR*	*7*	*2*	*1*	*2*	
2b)	Explain 1,2 – and 1,4 – addition reactions in conjugated dienes	*7*	*2*	*3*	*2*	
3a)	Write the preparations and chemical properties of alkynes *OR*	*7*	*5*	*1*	*9*	
3b)	Explain the chemical properties of higher alkynes	*7*	*2*	*2*	*5*	
4a)	Explain the preparation and chemical properties of cycloalkanes *OR*	*7*	*4*	*1*	*3*	
4b)	How Baeyer strain theory is used for explaining the stability of cycloalkanes.	*7*	*3*	*4*	*2*	
5a)	Explain the concept of aromaticity based on Huckels rule *OR*	*7*	*6*	*5*	*5*	
5b)	Explain aromatic substitution reactions of Benzene.	*7*	*3*	*4*	*4*	

PART – B

Answer any **FIVE** of the following questions. **5x3 = 15 M**

		Marks	BL	CLO	PLO	PI
6)	Write briefly about organic reagents	*3*	*1*	*1*	*1*	
7)	Explain the acidity of phenols by using mesomeric effect	*3*	*2*	*2*	*2*	
8)	Discuss Markonikov's rule	*3*	*2*	*1*	*3*	
9)	What is Diels - Alder reaction? Give example	*3*	*6*	*3*	*5*	
10)	Write briefly about the acidity of alkynes.	*3*	*5*	*3*	*9*	
11)	What are cyclo alkanes? Give example	*3*	*2*	*5*	*2*	
12)	What are ring activation groups? give example	*3*	*4*	*4*	*3*	
13)	Differentiate between benzenoid and non – benzenoid aromatic compounds.	*3*	*5*	*5*	*4*	

GOVERNMENT COLLEGE (A), RAJAHMUNDRY II B.Sc.

CHEMISTRY(H)

SEMESTER-III MODEL PAPER

Course - 6: ORGANIC CHEMISTRY (Halogen and Oxygen containing organic compounds)

Time: $2^1/_2$ hrs. **Maximum Marks: 50**

PART-

PART -A

Answer ALL the questions. Each carries SEVEN marks **5 x 7 = 35 M**

1. Discuss the mechanism and stereochemistry of SN^1 and SN^2 reactions taking suitable examples. BT2 CO1

(OR)

2. Write a short note on the following BT1 CO3
   i)Sandmeyer reaction b) Benzyne mechanism
3. a) Write the preparation of alcohols using Grignard reagent and Bouveault - Blanc reduction BT1 CO4

b) Explain Lucas method for identification of 1^0,2^0,3^0alcohols. BT3 CO2

(OR)

4. Explain the mechanism of Reimer-Tiemann and Kolbe- Schmidt reaction. BT1 CO3

5. How does Acetone react with the following reagents BT3 CO3
   i)HCN ii)$NaSHO_3$ iii) NH_2OH iv) NH_2NH_2

(OR)

6. Discuss the mechanism of Aldol condensation and Cannizaro reaction BT1 CO2

7. Explain the acidic and alkaline hydrolysis of esters with mechanism. BT2 CO2

(OR)

8. Write the preparation and any two synthetic applications of Aceto Acetic Ester.BT2 CO1

9. Discuss the constitution and configuration of glucose with experimental evidence and Write objections for open chain structure of glucose. BT3 CO3

(OR)

10. How do you convert i) Glucose to Fructose ii) Aldopentose to Aldohexose BT2 CO4

PART- B

Answer any FIVE of the following questions. Each carries THREE marks 5 x 3 = 15 M

11. Compare the reactivity of alkyl halides and vinyl halides BT4 CO2
12. Write the mechanism for Pinacol-Pinacolone rearrangement. BT2 CO1
13. Write a short note on Fries rearrangement.BT1 CO3
14. Give any two reduction reactions of carbonyl compounds. BT1 CO4
15. Explain the mechanism of Perkin reaction BT2 CO1
16. Write any two preparation methods for carboxylic acids. BT1 CO4
17. Write the mechanism of Huns-Diecker's reaction BT2 CO3
18. What is mutarotation? Why glucose shows mutarotation? BT2 CO2

GOVERNMENT COLLEGE (A), RAJAHMUNDRY II B.Sc.

CHEMISTRY (H)

SEMESTER-III

MODEL PAPER (From 2024-25)

Course – 7 Physical chemistry

Time: 2$^{1}/_{2}$ hrs. ***Maximum Marks: 50***

PART-A

Answer ALL the questions. Each carries SEVEN marks **5 x 7 = 35** M

	Marks	BL	CLO	PLO	PI
1) Explain Crystal deffects (or)	7	2	1	1	
2) What is Bragg's Law. Derive braggs equation	7	2	2	2	
3) Derive the relationship between Critical&Vanderwaal constants	7	2	1	2	
(or)					
4) Derive the Vander Waal's equation of state	7	2	3	2	
5) Differenciate between liquid crystals& liquids	7	5	1	9	
(or)					
6) Discuss any three applications ofLiquid crystals.	7	2	2	5	
7) Explain Nernst distribution Law. Explain its applications	7	4	1	3	
(or)	7	3	4	2	
8) Explain what azeotropes are ,Discussthe behavior of HCl-H2O and ethanol-water systems as azeotropes	7	6	5	5	
9) Explain the Hard and Soft Acids andBases (HSAB) principle	7	3	4	4	
(or)					
10) Using the Henderson-Hasselbalch Eq describe how the pH of a buffer solution can be calculated					

PART-B

Answer any FIVE Questions **5 × 3 = 15 M**

	Marks	BL	CLO	PLO	PI
11) write number of atoms in fcc and bcc unit cells	3	1	1	1	
12) Discuss the Law of Constancy of Interfacial Angles	3	2	2	2	
13) Explain the Joule-Thomson effect and its importance inthermodynamics.	3	2	1	3	
14) using Andrew's isotherms how do you explain behavior of carbon dioxide near its critical point?	3	6	3	5	
15) What are Smectic & Nematic liquid Crystals? Explain	3	5	3	9	
16) Describe the principle of steam distillation. Why is itparticularly useful for immiscible liquids?	3	2	5	2	
17) A solid X is added to a mixture of benzene and water.After shaking well and allowing to stand, 10 ml of the benzene layer was found to contain 0.13 g of X and 100 ml of water layer contained 0.22g of X. Calculate thevalue of distribution coefficient.	3	5	5	4	
18) , Explain common ion effect					

GOVERNMENT COLLEGE (A), RAJAHMUNDRY
II B.Sc. CHEMISTRY Hons. (SEMESTER-III)
MODEL PAPER

MODEL PAPER (From 2024-25)

Course -8: INORGANIC AND PHYSICAL CHEMISTRY

Time: $2^1/_2$ Hrs. **Maximum Marks: 50**

PART- A

Answer ALL the questions. Each question carries SEVEN marks. **5 x 7M = 35 M**

		Marks	BL	CLO	PLO	PI
1a	Discuss the stereo chemistry of compounds involving coordination number six.	7	2	1	1	
	OR					
1b	Describe the splitting of d- orbitals in octahedral complexes	7	2	2	2	
2a	Describe JOB's Method for the determination of composition of a complex.	7	2	1	2	
	OR					
2b	Write briefly about SN2reactions of square planar complexes?	7	2	3	2	
3a	Explain the ggeneral methods of preparation ofmono and binuclear carbonyls with examples	7	5	1	9	
	OR	7	2	2	5	
3b	Define 18electron rule? Give one example for each mononuclear, poly nuclear and substitutedmetal carbonyls?	7	4	1	3	
4a	State and explain first law of thermodynamics? Give it's limitations.	7	3	5	2	
	OR					
4b	Derive Kirchoff 's equation and indicate some of its applications					

5a Describe Carnot cycle and show that the work efficiency of a heat engine in a cyclic processis maximum.

7	6	4	5	
7	3	5	4	

OR

5b Write about the entropy changes in reversible processes.

PART – B

Answer any **FIVE** of the following questions. **5x3 = 15 M**

Marks	BL	CLO	PLO	PI
3	1	1	1	
3	2	2	2	
3	2	1	3	
3	6	3	5	
3	5	3	9	
3	2	4	2	

6 Write a short note on spectrochemical series.

7 Discuss about back bonding.

8 Explain the Trans effect.

9 Write the classification of organo metallic compounds on the basis of metal carbon bond?

10 Explain about Chelate effect.

11 Brief discuss about Joule-Thomson effect.

12 Write a short note on second law of thermodynamics

13 What is Carnot theorem.