GOVERNMENT COLLEGE (A), RAJAHMUNDRY
I B.Sc. CHEMISTRY Hons. (SEMESTER-II)
MODEL PAPER
Course - 3: INORGANIC 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

1. Explain the preparation and structure of Diborane. [BT2,CO1]

(OR)

2. What are Silicones? Explain the classification, preparation and applications of Silicones. [BT3,CO1]

3. What are Oxides? Explain the classification of Oxides based on Oxygen content. [BT2,CO2]

(OR)

4. Explain the preparation and structures of AX_3 and AX_5 type Inter halogen compounds. [BT2,CO2]

5. Why d- block elements exhibit variable oxidation states? Explain the variable oxidation states exhibited by d- block elements. [BT4,CO3]

(OR)

6. Explain the following characteristic properties of d-block elements. [BT2,CO3]

   (a) Complex forming ability (b) Magnetic properties.

7. What is Lanthanide contraction ? Explain the consequences of Lanthanide contraction. [BT2,CO3]

(OR)

8. How can you separate the Lanthanides by ion exchange method? [BT4,CO3]

9. What are Grignard reagents? Write the preparation and synthetic applications of Grignard reagents. [BT3,CO4]

(OR)

10. What are Organometallic compounds? Explain the classification of Organometallic compounds based on Carbon-Metal (C-M) bond. [BT3,CO4]

PART- B

Answer any FIVE of the following questions. Each question carries THREE marks

5 x 3M = 15M

11. Why Borazole is called as Inorganic Benzene? Explain in detail. [BT4,CO1]
12. Illustrate the structure of $P_3N_3Cl_6$. [BT2,CO1]
13 **.**Write a short note on pseudo halogens. [BT1,CO2]
14. Describe the classification of oxides based on chemical behavior. [BT2,CO2]
15. Why Cr and Cu exhibit abnormal electronic configurations? [BT4,CO3]
16. Why particularly d- block elements act as catalysts? Explain with suitable examples. [BT4,CO3]
17. Write the differences between Lanthanides and Actinides. [BT1,CO3]
18. Describe the classification of organometallic compounds. [BT2,CO4]

GOVERNMENT COLLEGE (A), RAJAHMUNDRY I B.Sc. CHEMISTRY (H)

SEMESTER-II

MODEL PAPER (From 2023-234)

Course - 4: GENERAL AND INORGANIC 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
7	2	2	4	
7	2	3	5	
7	3	2	4	
7	2	2	3	
7	3	3	4	

1. Explain in detail about Bohr's atomic model

(OR)

Describe the trends in atomic and ionic radii across periods and groups.

How do ionization potential and electron affinity change as you move across and down the periodic table?

2. Discuss the factors that favor the formation of ionic compounds. How do ionization potential, electron affinity, and electronegativity play a role in driving the creation ofthese compounds?

(OR)

What is the Born-Haber cycle, and how does it help us calculate the enthalpy offormation of an ionic compound?

3. Explain the geometries of $BeCl_2$, CH_4 and PCl_5 based on Valence bond theory (OR)

Construct Molecular Orbital diagrams for N_2 and NO NO molecules

7	**2**	**2**	**3**	
7	**3**	**3**	**6**	
7	**2**	**3**	**5**	
7	**3**	**2**	**2**	
7	**3**	**2**	**4**	

4. Explain in detail about the Band theory of metals

(OR)

Write about Vander Waals forces, ion dipole-dipole interactions and hydrogenbonding

5. Discuss Lewis acid – base theory with examples

(OR)

Explain HSAB principle with examples

PART- B

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

	Marks	BL	CLO	PLO
6. What is the inert-pair effect, and how does it manifest in heavier elements?	3	2	1	3
7. Discuss different scales of electronegativity briefly	3	2	2	4
8. Name two properties that are influenced by the polarization of ionic compounds.	3	2	3	5
9. Illustrate molecular structures of NH_3 and SF_4 by using the VSEPR model	3	2	2	6
10. Explain isoelectronic principle	3	1	2	7
11. Explain free electron theory of metals	3	2	3	6
12. Explain BRONSTED-LOWRY theory of acids and bases	3	1	2	5
11. Define pH, pKa & pKb	3	2	3	4