



বিদ্যাসাগর বিশ্ববিদ্যালয়  
**VIDYASAGAR UNIVERSITY**

**Question Paper**

**B.Sc. Honours Examinations 2021**

(Under CBCS Pattern)

**Semester - VI**

**Subject: CHEMISTRY**

**Paper: C 13-T & P**

**(Inorganic Chemistry)**

**Full Marks : 60**

**Time : 3 Hours**

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

**THEORY (Marks : 40)**

**Part A**

1. Answer any **one** question : (1×10=10)
- (a) (i) What is meant by active transport in Na/k pump ? Give a diagrammatic presentation of the process and explain the mechanism involved in it. (2+3)
- (ii) Write a name of O<sub>2</sub> transport 'HEME' protein and discuss its function. (1+2)
- (iii) Write the role of Ca<sup>+2</sup> ion in biological system. 2

(b) (i) What is Wilkinson catalyst ? Write the mechanism for hydroformylation reaction using  $\text{RhH}(\text{Co})(\text{PPh}_3)_2$  as the catalyst. (1+3)

(ii) Write short note on 'wacker process'. 2

(iii) What is Ziegler-Natta Catalyst ? Draw the catalytic cycle for the Ziegler-Natta polymerization of propene. (2+2)

2. Answer any two questions : (2×15=30)

(a) (i) What is proximal and Distal histidin ? What are their role in Hb and Mb ? (2+2)

(ii) What happens when carbon mono-oxide (CO) comes in contact in hemoglobin (Hb) ? 2

(iii) What do you mean by Bohr effect ? 2

(iv) Discuss the toxic effect of Cadmium. 2

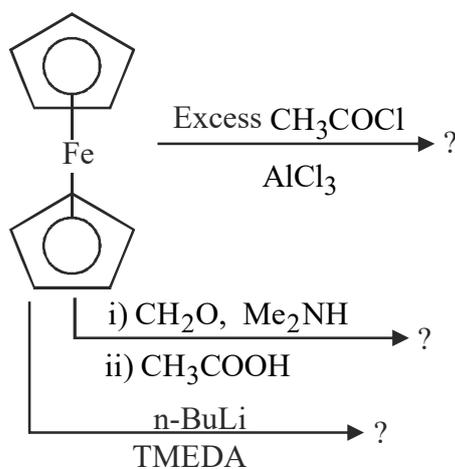
(v) Explain the colour and magnetic property of oxy-hemocyanin. 3

(vi) How many five and six membered rings present in the Heme protein of hemoglobin (Hb) ? 2

(b) (i) What do you mean by "Hapticity"? Explain with suitable example. 3

(ii) Discuss the migratory insertion reaction with an example. 2

(iii) Give two reactions of ferrocene which show it is more reactive than benzene. Write the product of the following reactions. (2+3)



- (iv) Using the molecular orbital diagram of carbon monoxide. Explain why it acts as an electron donor and acceptor through carbon and not through oxygen. 3
- (v) Manganese does not form a mononuclear carbonyl. Why? 2
- (c) (i) What is trans effect? Discuss the formation of trans -  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$  from  $[\text{Pt}(\text{NH}_3)_4]^{+2}$  by using trans effect probability. (2+2)
- (ii) Write the name of platinum complex use as a drug. 1
- (iii) What do you mean by kinetic and thermodynamic stability of a complex? 3
- (iv) Draw the structure of the following compounds. 3
- (a)  $\text{Ni}(\text{CO})_4$  (b)  $\text{Fe}_2(\text{CO})_9$  (c)  $\text{OS}_2(\text{CO})_9$
- (v) Write the name of electron carriers respectively present in photosystem - II. What is the role of  $\text{Mg}^{+2}$  in photosynthesis? (2+2)
- (d) (i) Write the active site structure of carbonic anhydrase and discuss its biological function. (1+2)
- (ii) What is 'Rieske protein'? 2
- (iii) The V - C bond lengths in  $[\text{V}(\text{CO})_6]$  and  $[\text{V}(\text{CO})_6]^-$  are 200 pm and 193 pm respectively— Explain. 3
- (iv) What do you mean by uniporter, symporter and antiporter? Give an example of antiporter type enzyme. (3+1)
- (v) What is synergistic effect? 3

**PRACTICAL**

**(Marks : 20)**

**Paper : C 13P**

Answer any *one* question :

1 × 20 = 20

1. Write the procedure of group IV PPT analysis to detect  $\text{Ca}^{+2}$  ion in a sample.
  2. Write down the procedure for separation of the precipitation of Group IIA and Group IIB metal sulphides.
  3. Write down the procedure of preparation of solution for wet test of acid radicals.
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