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Exam Code: 107402
Subject Code : 7033

B.Sc.(Bio Technology) - 2nd Semester (Old sylb. 2019-20)
(2721)
Paper : BT-3 Inorganic Chemistry-B

Time allowed: 2 hrs. **Max. Marks: 40**

Note: There are EIGHT questions of equal marks. Candidates are required to attempt any FOUR questions.

Section - A

1. (a) N_2 and CO are isoelectronic but M-N_2 complexes are much weaker than M-CO complexes. Offer a reasonable explanation. (3)

   (b) Give two methods for the preparation of metal carbonyls. Also discuss the nature of bonding involved in linear M-CO group in metal carbonyls. (7)

2. (a) Draw the structures of following metal carbonyls: (5)

   (i) $Fe_2(CO)_9$ (ii) $Ir_4(CO)_{12}$ (iii) $Fe_3(CO)_{12}$ (iv) $Rh_4(CO)_{12}$

   (b) Write a short note on metal carbonyl hydrides. (5)

Section - B

3. (a) Define podands. Give two examples. (3)

   (b) Discuss two methods to prepare crown ethers. Also discuss the factors affecting the selectivity of crown ethers. (7)

4. (a) Define cryptands. Give two examples. Also give two methods to prepare cryptands. (5)

   (b) Briefly discuss mechanism of phase transfer catalysis. Also give its advantages. (5)

Contd....P/2

Section - C

5. (a) Derive relationship between stepwise and commulative stability constants. (5)

   (b) The complexes containing chelate rings are more stable than those containing similar but unidentate ligands. Why is it so? Explain with the help of suitable example. (5)

6. (a) What do you understand by stability of complex ion? On what factors does the stability of a complex ion depend? Explain giving suitable examples. (7)

   (b) What are porphyrins? Also draw the structure of porphyrin. (3)

Section - D

7. (a) Briefly describe the role of sodium and potassium ions in the biological systems (5)

   (b) Draw the structure of chlorophyll. Also discuss its important role in photosynthesis. (5)

8. (a) Illustrate the structure of myoglobin and hemoglobin. Discuss in detail the roles played by these bioinorganic compounds in biological systems. (7)

   (b) Briefly describe the role of carbonic anhydrase in the biological systems. (3)

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