

MAY 2012

P/ID 40122/PCHB

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Time : Three hours

Maximum : 100 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

All questions carry equal marks.

Each answer should not exceed 50 words.

1. What are closoboranes?
2. Mention two uses of polymeric phosphazenes.
3. How can the structure of organometallic clusters be predicted?
4. Trans  $[m(L)_2(L')_2]$  complex is optically inactive. Explain.
5. What type of isomerism is exhibited by  $[\text{Co}(\text{NH}_3)_5\text{SO}_4]^{\oplus} \text{Br}^{\ominus}$  and  $[\text{Co}(\text{NH}_3)_5\text{Br}]^{+2} \text{SO}_4^{-2}$ ?
6. Give two examples of output units in a computer.
7. What is kinetic current?
8. Explain the terms standard deviation and correlation coefficient.

9. Write down the Henderson equation for the calculation of pH of an acidic buffer.
10. What are search engines? Give two examples.

PART B — (4 × 20 = 80 marks)

Answer ALL questions.

All questions carry equal marks.

11. (a) (i) Discuss the preparation and structure of carboranes. Explain the isomerism exhibited by them. (8)
- (ii) Describe the preparation of borazine. Compare and contrast the properties of borazine with benzene. (7)
- (iii) What are metal clusters? Explain the basis for their classification. (5)

Or

- (b) (i) Explain the preparation of phosphonitrilic compounds. Discuss the structure and bonding in phosphazenes. (6)
- (ii) Discuss the structure of sulphur nitrides. Explain the free radical mechanism leading to the formation of linear chains. (6)
- (iii) Explain the preparation, properties, bonding and structure of diborane. (8)

12. (a) (i) Describe the structure and functions of cyanocobalamin. (7)
- (ii) Explain the factors that affect the stability of complexes. (8)
- (iii) Write notes on crown ethers with two examples. (5)

Or

- (b) (i) Explain the biological importance of hemoglobin and myoglobin. (7)
- (ii) Describe the determination of stability constant of a complex using polarographic method. (7)
- (iii) Explain how ORD is useful in assigning the absolute configuration of a complex. (6)
13. (a) (i) What are the different types of currents contributing to the total current in polarographic technique? (8)
- (ii) Write the current voltage relationship in cyclic voltammetry and give the meaning of the parameters. (6)
- (iii) What are direct and back titrations in complexometry? (6)

Or

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- (b) (i) Explain the current voltage curve in polarographic technique. (8)
- (ii) Discuss the different types of EDTA titrations. Explain their uses. (6)
- (iii) How is the convection current eliminated in polarographic analysis? (6)
14. (a) (i) What is bond energy? Write a program for the determination of bond energy. (10)
- (ii) Discuss the concept of LAN and WAN. Explain how Internet has succeeded in connecting people across the globe. (10)

Or

- (b) (i) Outline algorithm for the determination of standard deviation of data. (10)
- (ii) Write notes on Chem web. Co, TCP/IP, Bandwidth and ISDN. (10)