

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name: Inorganic Chemistry-II

Subject Code: 5SC02ICH1

Branch: M.Sc. (Chemistry)

Semester : 2

Date : 20/10/2018

Time : 02:30 To 05:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator and any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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SECTION – I

- Q-1 Attempt the following questions (07)**
- a. Which type of compounds can be studied by ESR? (1)
 - b. Give the structure of Heme-b.? (1)
 - c. What are organometallic compounds? (1)
 - d. Define metallobiomolecules. (1)
 - e. What is coenzyme? (1)
 - f. What is an electron spin resonance phenomenon? (2)
- Q-2 Attempt all questions (14)**
- a. What are the differences between σ - and π -bonded complexes? Explain. (7)
 - b. Discuss instrumentation of ESR spectrophotometer. (7)
- OR**
- Q-2 Attempt all questions (14)**
- a. Write a note on hyperfine splitting in ESR. (7)
 - b. Discuss the toxicity of Lead and Cyanide. (7)
- Q-3 Attempt all questions (14)**
- a. Discuss the toxic effect of Arsenic and Mercury. (5)
 - b. Write a note on metalloporphyrins. (5)
 - c. Explain any four chemical reactions of σ -bonded organometallic compounds. (4)
- OR**
- Q-3**
- a. Write a note on iodine and thyroid hormone. (5)
 - b. Discuss the role of Haemoglobin and Myoglobin in human body. (5)
 - c. Give the differences between σ -bonded and π -bonded organometallic compounds. (4)



SECTION – II

- Q-4 Attempt the Following questions (07)**
- a. What is ion exchange? (2)
 - b. Define photosynthesis. (1)
 - c. Give the principle of ESR spectroscopy. (1)
 - d. Define oxyanions. (1)
 - e. Give example of Zeise salt? (1)
 - f. Why zinc is called as super biocatalyst? (1)
- Q-5 Attempt all questions (14)**
- a. Explain the separation of zinc and magnesium on anion exchanger. (7)
 - b. Explain theory and principle of ion exchange chromatography. (7)
- OR**
- Q-5**
- a. What are the advantages and disadvantages of ion exchange chromatography? (7)
 - b. Write a note on ion-exchange cellulose. (7)
- Q-6 Attempt all questions (14)**
- a. Explain classification of σ -bonded organometallic compounds. Write any four methods for preparation of σ -bonded organometallic compound. (10)
 - b. Discuss NMR studies of metal alkene complexes. (4)
- OR**
- Q-6 Attempt all Questions**
- a. Discuss factor affecting g value. Calculate the g value if the methyl radical shows ESR at 3290 G (0.3290 T) in a spectrometer operating at 9230 MHz. [where $h = 6.627 \times 10^{-34}$ Js, $\beta = 9.274 \times 10^{-24}$ JT⁻¹]. (7)
 - b. Explain hyperfine splitting formed by the interaction of an unpaired electron with two equivalent hydrogen atoms in ESR spectroscopy. (7)

