Exam Code: 0431
Sub. Code: 3442

2031

M.Sc. (Applied Chemistry/Pharmaceutical)

First Semester

Paper – 102: Inorganic Chemistry

Time allowed: 3 Hours | Max. Marks: 60

***NOTE**: Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I -IV.*

x-x-x

UNIT – I

I. a) Draw molecular orbital energy level diagram of O_2 molecule. Also write about its magnetic behaviour and calculate bond order.

b) Tell about stability of coordination complexes and explain various factors affecting stability. (6,6)

II. a) Discuss in detail about Wade's rules. Discuss and classify different types of carboranes on the basis of these rules.

b) Write a note on heteropolyanions. (7,5)

UNIT – II

III. a) Discuss in detail about Alkene Hydrogenation with help of catalytic cycle and mechanism.

b) Write synthesis of any two organometallic compounds. (8,4)

IV. a) Explain Hydroformylation reaction with help of catalytic cycle using suitable catalyst.

b) Write a note on spin cross over. (8,4)

UNIT – III

V. a) Discuss and differentiate Crown Ethers and Cryptands with help of examples.

b) Write a note on natural ionphores. (6,6)

VI. a) Discuss in detail nuclear fission reaction with suitable examples.

b) Explain any radio analytical technique. (7,5)

P.T.O.

UNIT – IV

VII. a) Discuss completely preparation, bonding structure and reactivity of transition metal nitrosyl compounds.

b) Write a brief note on dioxygen complexes. (8x4)

VIII. a) Discuss hybridization geometry and shapes of the following:-

i) $(SO_4)^{2-}$ ii) $XeOF_2$ iii) PCl_5 iv) IF_7

b) Write a note on sulphur nitrogen compounds. (8x4)

UNIT – V

IX. Attempt the following:-

a) Brief note on carbides

b) Nephelauxetic effect

c) Analylitical applications of Inner transition elements

d) Carboxylic ionophores (4x3)

x-x-x