M.Sc. (Analytical/Organic/Inorganic Chemistry - Sem II (CBCS)
SUMMER - 2019

SUBJECT : INORGANIC CHEMISTRY – II

Day : Saturday
Date : 20-04-2019

Time : 03:00 P.M. TO 6:00 P.M.
Max. Marks : 60

S.2019-1173

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of logarithmic tables/calculator is **ALLOWED**.
4) Draw neat and labeled diagrams **WHEREVER** necessary.
5) Answers to both the sections should be written in **SEPARATE** answer books.

SECTION – I

Q.1 Attempt **ANY THREE** of the following: **[15]**

a) What is VB Theory? Write the assumptions of VBT.
b) Define ore. Write the ores of Nickel metal and discuss the Mond's method for extraction of Nickel metal.
c) Explain the V.B. representation of the following complex ions:
i) $[Cr(NH_3)_6]^{+3}$ **ii)** $[MnCl_4]^{-2}$
d) Define and explain the terms:
i) Inert complexes **ii)** Labile complexes
e) Draw and explain the M.O. energy level diagram for $[CoF_6]^{-3}$ complex ion and explain its magnetic properties.

Q.2 A) Attempt **ANY TWO** of the following: **[10]**

i) Draw and explain in brief the crystal field diagram for:
a) Tetrahedral ligand field **b)** Octahedral ligand field.
ii) Write the merits and demerits of CFT.
iii) Write a note on : "Van Arkel's Method."

B) Solve **ANY ONE** of the following: **[05]**

i) Calculate the CFSE for Ni^{+2} ion in a weak tetrahedral ligand field.
ii) Calculate the number of unpaired electrons and magnetic moment in B.M. in **a)** $[Fe(CN)_6]^{-3}$ **b)** $[NiCl_4]^{-2}$ complex ions.

SECTION – II

Q.3 Attempt **ANY THREE** of the following: **[15]**

a) Explain the ion exchange method for separation of lanthanides.
b) Write a note on photosynthesis.
c) Define organometallic compound. Explain how sigma and Pi bonds are formed in metal carbonyl compounds.
d) Write a note on 'Polynuclear Iron Containing Proteins'.
e) What is lanthanide contraction? Discuss causes and consequences of lanthanide contraction.

Q.4 Attempt **ANY THREE** of the following: **[15]**

a) Write a note on 'Feed Stocks'.
b) Discuss the Wacker process to convert alkenes to aldehyde.
c) How copper is biologically important? Explain the role of 'Super oxide dismutage'.
d) What are transuranic elements? How are they prepared?
e) Write a note on oxidation states of Lanthanides.

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