14CHU16

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2019
(Fifth Semester)

Branch-**CHEMISTRY**

INORGANIC CHEMISTRY - 1

Time : Three Hours Maximum : 75 Marks

SECTION-A (20 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (-10x2 = 20)

1 Explain why Cu^{2+} is more stable than Cu^{+}.
2 Give the IUPAC names of the following:
(i) $K_4[Fe(CN)_6]$. (ii) $[Co(en)_3)_2(S0_4)3$
3 Calculate the EAN of the cental medal ion in the following complexes:
(i) $[Pt(NH_3)_4Cl_2]Cl_2$ and (ii) $[Co(en)_2Cl_2]Cl$
4 Compute CFSE (in A units) for d^7 (octahedral) and d^3 (tetrahedral) in a strong ligand field.
5 Define trans effect.
6 Illustrate the type of reactions in square planar complexes.
7 Draw the structure if vitamin B_{i2}.
8 Mention any two roles of copper and zinc in biological system.
9 How is sodium nitroprusside prepared?
10 Draw the structure of $Fe_3(CO)1_2$.

SECTION - B (25 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 5 = 25)

11 a Why do transition elements:
(i) Show variable oxidation states [2V2+2V2]
(ii) Give coloured and paramagnetic ions.
OR
b What are chelates? Describe some applications of chelate compounds. [2+3]

12 a Discuss the formation of the following complex ions on the basis of VBT:
(i) $[Cr(NH_3)_6]^{3+}$ and (ii) $[Ni(CN)_4$f.
OR
b Enumerate the factors that affect the crystal field splitting energy.

13 a Give an explanatory note on Tetragonal distortion in octahedral complexes.
OR
b Draw a' comparison between VB and CF theories of coordination compounds.

14 a What are iron-sulphur proteins? Discuss their role in biological oxidation.
OR
b What is Na^{+}-K^{+} pump? How does it function?

15 a Discuss the bonding present in $Fe_2(CO)_9$.
OR
b Write a brief note on metal nitrolysis.

SECTION - C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Discuss the stereo isomerism present in complexes with coordination number 4 & 6.

17 a) Give the main points of crystal field theory of coordination compounds. [6]
b) Compare the splitting of d-orbitals of octahedral and tetrahedral fields on the basis of CFT. [4]

18 a) On the basis of CFT, explain why $[Fe(H_20)_6]^{3+}$ is strongly paramagnetic and $[Fe(CN)_6]^{J'}$ is less paramagnetic. [6]
b) Explain the pi-bonding theory of trans effect. [4]

19 a) Discuss the mechanism of the intake of oxygen by myoglobin and hemoglobin. [6]
b) How would you account for the diamagnetic character of oxygenated myoglobin and oxygenated hemoglobin? [4]

20 Describe hr preparation and structure of ferrocene. (3+7)

Z-Z-Z END