PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2018
(Fifth Semester)

Branch - **CHEMISTRY**

INORGANIC CHEMISTRY - I

Time : Three Hours   Maximum : 75 Marks
SECTION-A (20 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks   (10x2 = 20)

1   What are d-block elements? Give any four examples.

2   Define the term coordination number. Write the structure of a metal complex having the coordination number 4.

3   Calculate effective atomic number of $[Co(NH_3)_6]^{3+}$.

4   Write the spectrochemical series.

5   State trans-effect.

6   Distinguish between VBT and CFT.

7   Draw the structure of chlorophyll.

8   Mention the uses of ferridoxin.

9   What is meant by back donation?

10   Draw the structure of $Fe_3(CO)i_2$.

SECTION - B (25 Marks!
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks $(5 \times 5 = 25)$

11   a Give the name of the following complexes.
    i) $[Co(NH_3)_4Cl_2]Cl$ ii) $[Pt(NH_3)_2Cl_2]$ iii) $[Cr(H_2O)_4Cl_2]^+$
    iv) $[Fe(CN)_6]^{4-}$ v) $[Ni(CO),,]$,
                          OR
    b What are the factors affecting the stability of complexes?

12   a . Explain Werner's theory of coordination compounds.
                          OR
    b Describe the valence bond theory of square planar complexes.

13   a $[Co(CN)_6]^{3'}$ is diamagnetic but $[CoF_6]^{''}$ is paramagnetic with the magnetic moment of about 5.3BM. Account for this difference in magnetic properties of these two octahedral complexes using CFT.
                          OR
    b Discuss the pi-bonding theory of trans-effect.

14   a   What are cytochromes? Give their structural features and biochemical functions.
                          OR
    b   Discuss the structure and biological importance of vitamin B_{12}.

15   a Explain the preparation and structure of $Ni(CO)_4$.
                          OR

SECTION - C (30 Marks)
Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks ($3 \times 10 = 30$)

16 a Give a brief account on the optical isomerism in 6- coordinated
    complexes. (5)
  b Discuss the applications of chelates in qualitative and quantitative
    analysis. (5)

17 a What is CFSE? Calculate the CFSE values for d^3 and d^7 octahedral
    complex. (4)
  b Explain the crystal field splitting in octahedral and tetrahedral
    complexes. (6)

18   What is Jahn-Teller distortion? Discuss the structure of $[Cu(H_2O)6]^{2+}$
       using Jahn-Teller Theorem. (2+8)

19   Discuss the structure and biological function of hemoglobin
       and myoglobin. (5+5)

20   Write the preparation, properties and structure of ferrocene. (3+3+4)

Z-Z-Z   END