29/5/24

Performa-QP-I

DOON UNIVERSITY, DEHRADUN

Mid Semester Examination, 4th Semester, 2024

Academic Year 2023-24 (Odd/Even Semester)

School of Physical sciences Department of Chemistry

Programme Name: B.Sc. (Hons.)

Course Code with Title: CYC-251 (Coordination Chemistry)

Time Allowed 3.00 Hours/2.00 Hours ***Maximum Marks: 30***

Note: All questions are compulsory.

SECTION: A

(VeryShort Answer Type Questions) (10×1=10)

1. Which type of isomerism exhibits compounds with same chemical formula and bonds but different spatial arrangement?
   a) Optical isomerism
   b) Linkage isomerism
   c) Structural isomerism
   d) Solvate isomerism
2. A coordination complex $[MX_2L_2]$, has a CN=4 and two unidentate ligands X and L. When the two L ligands are arranged opposite to each other in its geometry, it is called _____ isomer.
   a) cis
   b) trans
   c) fac
   d) mer
3. How many geometrical isomers are possible in a complex of type $[MA_2(D)_2]$, where A is unidentate and D is didentate?
   a) 0
   b) 2
   c) 3
   d) 4
4. Whith metal has highest melting point?
   (a) Pt
   (b) W
   (c) Pd
   (d) Au.

5. Which metal has highest density?

(a) Pt
(b) Hg
(c) Pd
(d) Os

6. What happens to the atomic size of lanthanides as the atomic number increases?

a) The radius remains unchanged
b) The radius first increases and then decreases
c) The radius increases
d) The radius decreases

7. What is the lanthanide's final element?

a) Ytterbium
b) Erbium
c) Thulium
d) Lutetium

8. What is the oxidation state of Fe Haemoglobin?
9. What is the electronic configuration of Gd^{+3}
10. What are the common oxidation state of vanadium?

SECTION: B

(Short Answer Type Questions) (5×2=10)

1. Discuss the Chemistry of titanium including their oxidation state.
2. Calculate the magnetic moment of Gd^{+3} and Dy^{+2}.
3. Explain the optical isomerism in square planar complexes.
4. What is origin of colour in lanthanide complexes?
5. Explain the mechanism of Haemoglobin.

SECTION: C

(Long Answer Type Questions) (2×5=10)

1. Discuss the chemistry of Cobalt.
2. Explain the stereochemistry of octahedral complexes.