

**B.SC. CHEMISTRY
FIRST SEMESTER
INORGANIC CHEMISTRY-I
BSC – 102 IDMn
[USE OMR FOR OBJECTIVE PART]**

**SET
A**

Duration: 1.30 hrs.

Full Marks: 35

Time: 15 min.

(Objective)

Marks: 10

Choose the correct answer from the following:

1X10=10

- Which of the following pairs has the same bond order?
a. O_2^+ , NO^+
b. N_2 , O_2
c. O_2^{2-} , B_2
d. NO , CO
- O-O bond length is minimum in
a. O_2^-
b. O_2
c. O_2^+
d. O_2^{2-}
- Which of the following d orbitals take part in the octahedral complex with d^2sp^3 hybridisation?
a. d_{xy} , d_{yz}
b. d_{xz} , $d_{x^2-y^2}$
c. $d_{x^2-y^2}$, d_{z^2}
d. d_{z^2} , d_{xz}
- Which of the following has sp^3 hybridisation?
a. NF_3 , BF_3
b. SiF_4 , BeH_2
c. H_2S , BF_3
d. NF_3 , H_2O
- The hybridisation and geometry of XeF_4 are
a. sp^3d^2 , square planar
b. sp^3d^2 , octahedral
c. sp^3d^3 , triangular planar
d. sp^3d , trigonal bipyramidal
- Electron gain enthalpy is also called
a. Electron affinity
b. Ionization potential
c. Ionization enthalpy
d. None of the above.
- Electro negativity along a period with increase in atomic number
a. Increases
b. Decreases
c. Remains unchanged
d. None of the above.
- Ionisation enthalpy with increase in atomic number
a. Increases along a group
b. Decreases along a group.
c. Remains unchanged in a group or period
d. None of the above.

9. Atomic radii is also called
- a. Ionic radii
 - b. Covalent radii
 - c. Crystal radii
 - d. None of the above
10. Ionic radii with increase in atomic number
- a. Increases along a group
 - b. Decreases along a group
 - c. Increases along a period
 - d. None of the above

(Descriptive)

Time : 1 hr. 15 min.

Marks : 25

[Answer question no.1 & any two (2) from the rest]

1. a. Mention the hybridization of following species 2.5+2.5
=5
NH₃, XeF₆, CH₃⁻, CO₃²⁻, NO₂⁻
- b. How and why ionization enthalpy varies along a group and period?
2. a. Explain the molecular orbital energy level diagram for O₂⁺ ion 5+2+3
=10
and mention the following
(i) Number of unpaired electron
(ii) Magnetic behavior
(iii) Magnetic moment
- b. Arrange the following species in increasing order of bond length and bond order
O₂, O₂⁺, O₂²⁻, O₂⁻
- c. Explain the hybridization of SF₆ molecule using valence bond theory.
3. a. Why o-nitrophenol is more volatile than p-nitrophenol? Explain. 2+3+5
=10
- b. Calculate the formal charge of NO₂ molecule.
- c. Explain the molecular orbital energy level diagram for F₂ molecule and calculate bond order, magnetic moment.
4. a. Explain why radius of chloride ion is larger than that of chlorine atom and sodium ion is smaller than sodium atom. 5+5=10
- b. What is effective nuclear charge? Calculate the effective atomic number of Al (Z=13).
5. a. How did Pauling define electro negativity of an element? How is it related to ionisation enthalpy? 10
- b. What is Screening Effect of nucleous? How is it related to atomic number and effective number?

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