T. Y. B. Sc. Semester- V

INORGANIC CHEMISTRY (Paper-II)

Questions Bank

UNIT- I

1. BF_3 molecule belongs to the following point group.
   a) C_{2v} b) D_{3d} c) C_{3v} d) D_3h
2. CO_2 belongs to the following point group.
   a) D_{2h} b) $D\infty_h$ c) C_{2v} d) $D\infty v$
3. Among the following molecules which does not contain a C_3 axis?
   a) PCl_3 b) NH_3 c) H_2O d) BCl_3
4. Which among the following species possesses both C_3 as well as C_2 axes?
   a) Trans dichloroethylene b) NH_3 c) BCl_3 d) H2O
5. Which of the following do not belong to the C_3V point group?
   a) PH_3 b) AsH_3 c) NH_3 d) H_2O
6. $CF_2=CF_2$ belongs to which groups.
   a) D_{3h} b) $D\infty v$ c) D_{2h} d) D_{3h}
7. T_d is point group of….
   a) Octahedron b) Regular tetrahedron c) Square planar d) Pyramidal
8. Centre of inversion is absent in ……. point group.
   a) D_{2h} b) D_{4h} c) D_{6h} d) Td
9. σ_h is a symbol of ---------
   a) Horizontal plane of symmetry
   b) Dihedral plane of symmetry
   c) Vertical plane of symmetry
   d) Proper rotational axis of symmetry
10. Symbol of identity is ---------
    a) E b) σ c) i d) Sn
11. The rotation axis C_n for water is --------
    a) C_2 b) C_3 c) C_4 d) C_1
12. Trans-dichloroethylene is an example of --------
    a) $C\infty\nu$point group
    b) $D\infty_h$ point group
    c) C_{2v} point group
    d) C_{2h} point group
13. D_{3h} point group has ------
    a) $3C_3$ axis and one C_2 axis
    b) C_3 axis and three C_2axis
    c) C_3 axis and one C_2 axis
    d) $2C_3$ axis and one C_2 axis

14. For a centre of symmetry to exist ,except atom at i, all the atoms in a molecule must occur -----
    a) In pairs
    b) Singly
    c) Triply
    d) Passing in pairs and partially in single
15. Symmetry operation moves an object into a position ------with its original one.
    a) Indistinguishable b) Distinguishable c) Identical d) Different

Unit-II

1. APF in simple cubic cell is ----------
    a) 0.74 b) 0.68 c) 0.52 d) 0.80
2. Packing density in simple cubic cell is ----------
    a) 42% b) 48% c) 52% d) 60%
3. The fraction of volume occupied in fcc unit cell is -------
    a) 0.26 b) 0.68 c) 0.74 d) 0.40
4. Compound which shows Frenkel defect is -------
    a) NaCl b) KCl c) AgBr d) KBr

5. Due to Frenkel defect the density of ionic solid --------.
    a) Increases b) Decreases c) remains the same d) fluctuate
6. The ABC, ABC type of packing is called as---------packing
    a) Face centred b) simple cubic c) cubic close d) hexagonal
7. The number of nearest neighbours for an atom or ion is called…
    a) oxidation number b) coordination number c) voids d) layers
8. The number of nearest neighbours around each particle in FCC lattice is…..
    a) 4 b) 8 c) 12 d) 5
9. A point in crystal lattice signifies ----------
    a) Size of particles
    b) Position of particles
    c) Position of the centre of particles
    d) Number of particles
10. In two dimensions closest packing, each sphere is in contact with other ----
    a) Four spheres b) six spheres c) eight spheres d) ten spheres
11. Coordination number in BCC lattice is --------
    a) 4 b) 8 c) 6 d) 2
12. Number of atoms per unit cell in BCC structure is -------
    a) One b) four c) six d) two
13. Schottky defect in the crystal is ----------
    a) Impurity defect
    b) Interstitial defect
    c) Vacancy defect
    d) Line defect.
14. In Schottky defect of ionic solid ---------

a) Anion is missing
b) Cation is missing
c) Both cations & anions are missing
d) A line is missing

15. When atom is missing from its lattice site and occupy interstice between lattice sites results in -------
a) Impurity defect
b) Interstitial defect
c) Vacancy defect
d) Line defect.

Unit-III

1. The electrons that have incompletely filled (n-2) f orbitals in their ground state are called.....
   a) Transition elements
   b) Inner transition elements
   c) s block elements
   d) p block elements
2. The electronic configuration of Sm^{2+} is.....
   a) $[Xe]4f^5$ b) $[Xe]4f^{10}$ c) $[Xe]4f^6$ d) $[Xe]4f^8$
3. The lanthanide ion that is colourless is.....
   a) Pr^{3+} b) Gd^{3+} c) Nd^{3+} d) Sm^{3+}
4. Compared to actinides, lanthanides shows.....tendency to form complexes.
   a) Weaker b) Stronger c) Similar d) Zero
5. Ln-Co alloys are used in making…..
   a) Permanent magnets b) superconductors c) insulators d) both a&b
6. Among following the diamagnetic lanthanide is.....
   a) Ho^{3+} b) Lu^{3+} c) Ce^{3+} d) Sm^{3+}
7. The radioactive lanthanide is.....
   a) Cerium b) Gadolinium c) Promethium d) Lutetium
8. Rate of ion exchange is ..... to the size of hydrated Ln^{3+} ion.
   a) Inversely proportional b) Directly proportional c) Similar d) Not related
9. The magnetic property of lanthanide ions is due to the contribution of.....of their electrons.
   a) Spin moment b) Orbital moment c) Spin and orbital moment d)angular momentum
10. Lanthanides are characterized by preferential filling of.....
    a) 6d orbital b) 4f orbital c) 4p orbital d) 3d orbital
11. The tripositive ion having maximum number of unpaired 4f electron is.....
    a) La^{3+} b) Gd^{3+} c) Ce^{3+} d) Eu^{3+}
12. Due to lanthanide contraction.....

a) All f block ion have equal size
b) All isoelectronic ion have equal size
c) Zr and Hf have equal size
d) Fe, Co, Ni ion have equal size

13. The lanthanide contraction is responsible for the fact that.....
a) Zr and Zn have same oxidation state
b) Zr and Nb have similar oxidation state
c) Zn and Y have same radii
d) Mo and W have same radii

14. The electronic configuration of Gd is.....
a) $[Xe]4f^8, 5d^9, 6s^2$ b) $[Xe]4f^7, 5d^1, 6s^2$ c) $[Xe]4f^6, 5d^2, 6s^2$ d) $[Xe]4f^3, 5d^3, 6s^2$

15. The lanthanide contraction is due to.....
a) Filling of 5d before 4f
b) Filling of 4d before 4f
c) Filling of 4f before 5d
d) Filling of 4f before 4d

Unit-IV

1. Which of the following is not a non-aqueous solvent.?
a) Liq. NH_3 b) H_2O c) CH_3COOH d) Liq. N_2O_4
2. The product of distance between centres of two charges and the value of one of the charge is called.....
a) Electronegativity b) Electron affinity c) Dipole moment d) Solvolysis
3. A solute easily dissolves in solvent when heat of solvation is.....than lattice energy.
a) Greater b) Smaller c) Equal d) Moderate
4. According to Lowry-Bronsted concept, acid is.....
a) Proton donor b) Proton acceptor c) OH^- donor d) Electron pair donor
5. The solvent in which acids ionizes to different extents so that relative strength of acids can be measured is called.....
a) Levelling solvent
b) Differentiating solvent
c) Basic solvent
d) Acid solvent
6. Valance electronic configuration of group 16 element is.....
a) ns^2np^4 b) ns^2np^2 c) ns^2np^3 d) ns^2np^5
7. Group 16 elements are the member of.....family.
a) s block b) p block c) d block d) f block
8. Valance electron present in group 16 elements is equal to.....
a) 6 b) 5 c) 4 d) 2
9. .....is the most electronegative element in group 16.
a) Selenium b) Sulphur c) Oxygen d) Polonium

10. In group 16 elements, to complete the octet.....number of electron required.
    a) 3 b) 1 c) 5 d) 2
11. Valance electronic configuration of group 17 element is.....
    a) ns^2np^4 b) ns^2np^2 c) ns^2np^3 d) ns^2np^5
12. Valance electron present in group 17 elements is equal to.....
    a) 6 b) 5 c) 4 d) 7
13. In group 17 elements, to complete the octet.....number of electron required.
    a) 3 b) 1 c) 5 d) 2
14. .....is the most electronegative element in group 17.
    a) Fluorine b) Chlorine c) Bromine d) Iodine
15. All halogens react with hydrogen forms.....
    a) HX b) HX_2 c) HX_3 d) HX_4

ANSWER KEY

UNIT-I

Ques.No	Answer
1	d
2	b
3	c
4	c
5	d
6	c
7	b
8	d
9	a
10	a
11	a
12	d
13	b
14	a
15	a

UNIT-II

Ques. No	Answer
1	c
2	c
3	c
4	c
5	c
6	c
7	b
8	c
9	b
10	b
11	b
12	d
13	c
14	c
15	b

UNIT-III

Question No.	Answer
1	b
2	c
3	b
4	b
5	a
6	b

7	c
8	a
9	c
10	b
11	b
12	c
13	d
14	b
15	c

UNIT-IV

1	b
2	c
3	a
4	a
5	b
6	a
7	b
8	a
9	c
10	d
11	d
12	d
13	b
14	a

15	a