**T.Y.B.Sc. Sem. – V**
**Examination Mission 2020**
**(Sample Questions)**

# Inorganic Chemistry

## UNIT-1

Q.1 Center of inversion is absent in the following point group

a) Td

b) $D_2h$

c) $D_6h$

d) $D_4h$

Q.2 D4h point group belong to the molecule.

a) $[ptCl4]^{-2}$

b) $NH_4^+$

c) $CCl_4$

d) $CH_3Cl$

d) Triangular

Q.3 HCl belongs to the following point group

a) $C_2v$

b) $D_2h$

c) $C_\infty v$

d) $D_\infty h$

Q.4 HCN belongs to the following point group

a) $C_2v$

b) $D_2h$

c) $C_\infty v$

d) $D_\infty h$

Q.5 $BCl_3$ molecule belongs to the following point group

a) $C_2v$

b) $D_3d$

c)$C_3v$

d) $D_3h$

Q.6 Trans dichloro ethylene belongs to the following point group

a) $C_2v$

b) $D_3d$

c)$C_3v$

d) $C_2h$

Q.7 $H_2O$ belongs to the following point group

a) $C_2v$

b) $D_2h$

c) $D_\infty v$

d) $D_\infty h$

Q.8 When molecule rotated with respect to a line, a plane, or a point is called

a) symmetry

b) symmetry operation

c) symmetry element

Q.9 The shape of $H_2O$ molecule is

a) linear

b) angular

c) T shaped

Q.10 What is the bond order of HCl molecule

a) 1

b) 2.5

c) 2

d) 3

Q.11 The magnetic behavior of NO molecule

a) paramagneic

b) diamagneic

c) ferromagneic

Q.12 The magnetic behavior of CO molecule

a) paramagneic

b) diamagneic

c) ferromagneic

Q.13 The magnetic behavior of HCl molecule

a) paramagneic

b) diamagneic

c) ferromagneic

Q.14 The magnetic behavior of $H_2O$ molecule

a) paramagneic

b) diamagneic

c) ferromagnetic

Q.15 The magnetic behavior of $H_3$+ ion

a) paramagneic

b) diamagneic

c) ferromagnetic

Q.16 The magnetic behavior of $H_3$molecule

a) paramagneic

b) diamagneic

c) ferromagneic

## UNIT 2

Q.17 APF in FCC is

a) 0.74

b) 0.68

c) 0.52

Q.18 Packing density in SSC is

a) 74%

b) 68%

c) 52%

Q.19 The fraction of volume occupied in FCC unit cell is

a) 0.26

b) 0.68

c) 0.74

Q.20 The fraction of volume occupied in BCC unit cell is

a) 0.26

b) 0.68

c) 0.74

Q.21 The fraction of volume occupied in SSC unit cell is

a) 0.52

b) 0.68

c) 0.74

Q.22 The void (vacant) space in FCC unit cell is

a) 26%

b) 32%

c) 48%

Q.23 The void (vacant) space in BCC unit cell is

a) 26%

b) 32%

c) 48%

Q.24 The void (vacant) space in SSC unit cell is

a) 26%

b) 32%

c) 48%

Q.25 Compound which shows Frenkel defect is

a) NaCl

b) KCl

c) AgBr

Q.26 Compound which shows Frenkel defect is

a) NaCl

b) KCl

c) ZnS

Q.27 Compound which shows schottky defect is

a) NaCl

b) ZnS

c) AgI

Q.28 Compound which shows schottky defect is

a) CsCl

b) ZnS

c) AgI

Q.29 Due to frenkel defect the density of ionic compounds

a) increases

b) decreases

c) remains the same

Q.30 The unit cell present in ABAB ------- closest packing of atom is

a) bcc

b) hcp

c) fcc

Q.31 the number of nearest neighbours around each particle in bcc lattice is

a) 4

b) 8

c) 12

Q.32 The number of nearest neighbours around each particle in simple cubic lattice is

a) 4

b) 8

c) 6

State whether the following statements are true or false

Q.33 Compound which shows schottky defect is

a) KBr

b) ZnS

c) AgI

Q.34 APF in SSC is

a) 0.74

b) 0.68

c) 0.52

Q.35 Number of atoms in bcc unit cell is 4

a) True

b) False

Q.36 ABC ABC type packing results in fcc unit cell.

a) True

b) False

Q.37 In case of bcc unit cell edge length a is given by $4r/\sqrt{2}$ where r is radius of particle.

a) True

b) False

Q.38 Void space in bcc unit cell is 26%

a) True

b) False

Q.39 In bcc unit cell central atom is common to four unit cell.

a) True

b) False

Q.40 packing density in SSC is

a) 74%

b) 68%

c) 52%

Q.41 As temperature increases number of Schotty defects decrease.

a) True

b) False

Q.42 ZnS shows Frtenkel defects

a) True

b) False

Q.43 Coordination number of particle in SCC is 6

a) True

b) False

Q.44 Coordination number of particle in SCC is 8

a) True

b) False

Q.45 Compound which shows Frenkel defect is

a) NaCl

b) KCl

c) AgCl

Q.46 Coordination number of particle in BCC is 6

a) True

b) False

Q.47 Coordination number of particle in BCC is 8

a) True

b) False

Q.48 Coordination number of particle in FCC is 12

a) True

b) False

Q.49 Coordination number of particle in hcp is 12

a) True

b) False

Q.50 Coordination number of particle in FCC is 6

a) True

b) False

Q.51 Coordination number of particle in FCC is 6

a) True

b) False

Q.52 In schottky defects density of ionic solids Increases

a) True

b) False

Q.53 AgCl shows Frtenkel defects

a) True

b) False

Q.54 AgBr shows Frtenkel defects

a) True

b) False

Q.55 AgI shows Frtenkel defects

a) True

b) False

Q.56 NaCl shows Schottky defects

a) True

b) False

Q.57 KCl shows Schottky defects

a) True

b) False

Q.58 KBr shows Schottky defects

a) True

b) False

Q.59 CsCl shows Schottky defects

a) True

b) False

Q.60 Super conductor is perfectly diamagnetic material.

a) True

b) False

Q.61 Super conductor is perfectly paramagnetic material.

a) True

b) False

Q.62. Super conducting magnets are used in NMR

a) True

b) False

Q.63 High temperature super conductor shows super conductivity below 77K

a) True

b) False

Q.64 High temperature super conductor shows super conductivity above 77K

a) True

b) False

Q.65 Conventional super conducting materials require liquid helium for cooling.

a) True

b) False

Q.66 Generally niobium is used in making conventional super conductors

a) True

b) False

Q.67 In C60 Fullerene there are 20 six membered rings.

a) True

b) False

Q.68. In C60 Fullerene there are ---------- five membered rings.

a) 10

b) 12

c) 20

# UNIT 3

Q.69 The electronic configuration of promethium $Eu^{+3}$ is

a) [Xe] $4f^6$

b) [Xe] $4f^3$

c) [Xe] $4f^5$

Q.70 The electronic configuration of promethium $Eu^{+2}$ is

a) [Xe] $4f^4$

b) [Xe] $4f^7$

c) [Xe] $4f^5$

Q.71 The electronic configuration of promethium $Gd^{+3}$ is

a) [Xe] $4f^4$

b) [Xe] $4f^7$

c) [Xe] $4f^5$

Q.72 The elements that have incompletely filled (n-2) f orbitals in any of their oxidation state are called ----

a) Transition elements

b) Inner transition elements

c) 4f block element

Q.73 Samerium is a ------- elements.

a) Transition elements

b) 5f block element

c) 4f block element

Q.74 Europium is a ------- elements.

a) Transition elements

b) 5f block element

c) 4f block element

Q.75 Neodymium is a ----------

a) Lanthanide

b)Actinidec

c) None of these

Q.76 The atomic number of Thulium is

a) 65

b) 67

c) 69

Q.77 The atomic size of lanthanides ---------- from La to Lu.

a) Increases

b)Decreases

c) Remains same

Q.78 The ionic size of lanthanides ---------- from La to Lu.

a) Increases

b)Decreases

c) Remains same

# UNIT 4

Q.79 $NH_3$ is ---------- solvent

a) non ionizing

b)Aprotic

c) protic and ionizing and basic

d) Aprotic and non ionizing

Q.80 $NH4^+$ is ---------- in nature in liquid ammonia

a) Basic

b)Acidic

c) Amhoteric

d) None of these

Q.81 $NH^{-2}$ is ---------- in nature in liquid ammonia

a) Basic

b)Acidic

c) Amhoteric

d) None of these

Q.82 $N^{-3}$ is ---------- in nature in liquid ammonia

a) Basic

b)Acidic

c) Amhoteric

d) None of these

Q.83 Liquid $N_2O_4$ is dimer of ----------

a) NO

b)$N_2O_2$

c) $NO_2$

d) None of these

Q.84 $NO^+$ is ---------- in nature in liquid dinitrogen tetroxide

a) Basic

b)Acidic

c) Amhoteric

d) None of these

Q.85 $NO3^-$ is ---------- in nature in liquid dinitrogen tetroxide

a) Basic

b)Acidic

c) Amhoteric

d) None of these

Q.86 The blue color of alkali metal ion in liquid Ammonia because of

a) Electron

b) Proton

c) Ammoniated electron

d) None of these

Q.87 $H_2O$ is ---------- solvent

a) non ionizing

b) Aprotic

c) Amphoteric

d) Aprotic and non ionizing

Q.88 Ionisation energy of group 16 elements ---------- from top to bottom.

a) Decreases

b) Increases

c) Remains same

Q.89 All the elements of group 16 except ---------- has vacant d orbital in valency shell.

a)Sulphur

b) Tellurium

c) Oxygen

Q.90 Dioxygen molecule is ----------

a) paramagnetic

b) Diamagnetic

c) Feromagnetic

Q.91 ---------- is called king of chemical

a)HCl

b) $HNO_3$

c) $H_2SO_4$

Q.92 In the manufacture of H2SO4 ---------- Catalyst is used.

a) $V_2O_5$

b) Platinised asbestos

c) Both a) and b)

Q.93 ---------- gas is usually produced by burning iron pyrites

a) $SO_2$

b) $SO_3$

c) $CO_2$

Q.94 ---------- has lowest electron affinity than other halogens.

a) Iodine

b) Bromine

c) Fluorine

Q.95 The oxidizing power of halogens ------- F to I.

a) Decreases

b) Increases

c) Remains same

Q.96 Halogen exist in the electrons from as ---------- molecules.

a)Diatomic ionic

b) Diatomic Covalent

c) Coordinate

Q.97 ---------- is most reactive interhalogen compound.

a)$IF_5$

b) $BrF_3$

c) $ClF_3$

State whether the following statements are true or false

Q.98 ---------- acid is strongest acid amongst oxyacids of chlorine

a) HClO3

b) HClO2

c) HClO4

Q.99 I2 molecules absorbs yellow light of lower energy and transmit red light.

a) True

b) False

Q.100 Ionisation energy of fluorine is lowest amongst all other halogen.

a) True

b) False

Q.101 Iodine exhibits metalloid character.

a) True

b) False

Q.102 Chlorine has highest electron affinity value which decreases from chlorine to Iodine

a) True

b) False

Q.103 Oxidation state of Oxygen in $H_2O_2$ is ----------

a) -2

b) +2

c) -1

Q.104 The bond dissociation energy increases from chlorine to iodine.

a) True

b) False

Q.105 Electronegativity of group 16 elements ---------- from top to bottom.

a) Decreases

b) Increases

c) Remains same

Q.106 The bond strength of interhalogen increases electronegativity difference between the halogen increases.

a) True

b) False

Q.107 Interhalogen compounds are insoluble in organic as well as inorganic solvrnts.

a) True

b) False

Q.108 Liquid $N_2O_4$ is dimer of ----------

a) NO

b)$N_2O_2$

c) $NO_2$