Sample Questions Inorganic Chemistry.

M. Sc. I SEM I

1) The hybridization of SF_6 molecule is ……..

a) sp^3

b) sp^2d

c) sp^3d

d) sp^3d^3

2) The bond angle in CH_4 is ……

a) 90^0

b) $104^027'$

c) 120^0

d)$109^028'$

3) The two SP hybrid orbitals Z axis as bond axis then wave functions are …….

A) $\Psi 1 = 1/\sqrt{2}(\phi S + \phi Pz)$ & $\Psi 2 = 1/\sqrt{2}(\phi S + \phi Pz)$

B) $\Psi 1 = 1/\sqrt{2}(\phi S + \phi Py)$ & $\Psi 2 = 1/\sqrt{2}(\phi S + \phi Pz)$

C) $\Psi 1 = 1/\sqrt{2}(\phi S + \phi Px)$ & $\Psi z = 1/\sqrt{2}(\phi S - \phi Py)$

D) $\Psi 1 = 1/\sqrt{2}(\phi S + \phi Pz)$ & $\Psi z = 1/\sqrt{2}(\phi S - \phi Pz)$

4) BF_3, B Br_3, B Cl_3, $B(OH)_3$ & $B(CH_3)_3$ all the examples of …….. hybridisations.

A) SP

B) SP^2

C) SP^3

D) SP^2d

5) The structure of Iodine heptofluoride and xenon hexafluoride involves hybridization as –

A) SP^3d^2, SP^3d^3resp.

B) SP^3d^3, SP^3d^2resp.

C) SP^3d, SP^3d^2resp.

D) $SP^3d^3$for both

6) PCl_5 and SF_4 gives SP^3d hybridisation their geometry resp. as

A) Trigonal bipyramidal Both

B) Trigonal bipyramidal & Pyramidal

C) Pentagonal bipyramidal & octahedral

D) Trigonal biyramidal and see saw structure

7) BCl_3 and $TeCl_4$ both shows SP^3d hybridisation, their geometry resp. as –

A) Distorted trigonal bipyramidal and Bent T-shaped

B) trigonal bipyramidal both

C) trigonal bipyramidal and Tetrahedral

D) Distorted trigonal bipyramidal and square pyramidal

8) For as set of elements, with a relationship between them, to form a group ……

following rules must be fulfilled.

A) Closure

B) Associativity

C) Identity & Inverse element

D) A, B, C

9) The point group in the molecule tetrahedral Si HCl BrI is……

A) C1

B) C2

C) C2v

D) C2h

10) Centre of inversion is absent in the following point group ……

a) D_2h
b) b) D_4d
c) c) D_6d
d) d) Td

11) H_2O molecule belongs to following point group …….

a) D_2h

b) D_2d

c) C_3V

d) C_2V

12) Which molecule does not have Td symmetry ?

a) SiF_4
b) b) P_4
c) c) CH_4
d) d) NF_3

13) The boiling points of the halogens increase going from F_2 to I_2. What type of intermolecular forces are responsible for this trend?

A) Permanent dipole

B) Hydrogen bonding

C) Ion-ion attraction

D) London dispersion forces

14) The G term consist of ……..

a) A+E+T1g+T2g b)A+2E+T1g

c) A+2Eg+2Tg d) Eg+2T1g+T2g

15) The atomic symbol for electrons for L= 2 & S= 1 is …….

a) $^2D_{3,2,1}$ b) $^3D_{3,2,1}$ c) $^3D_{0,1,2}$ d) $^3D_{3/2,1/2,1}$

16) In sol–gel method to produced solid material from …….molecule .

a) big b) small c) long d) short

17) The top most filled energy level at absolute zero temperature is known as …….level.

A) Brillion

B) Fermi

C) K-Space

D) Sommerfield

18) The first and second Brillouin zone in inorganic solids along x and y axis represented as

A) π/a, $2\pi/a$

B) a/π, $a/2\pi$

C) $-\pi/a$, $-2\pi/a$

D) $\pm\pi/a$, $\pm 2\pi/a$

19) What type of semi conductor materials is created when a germanium crystal is doped with pentavalent impurity atoms? And decreasing energy band gap of about ……ev.

A) n-type, 0.01

B) P-type; 1

C) intrinsic; 0.1

D) P-type; 0.01

20) SmS SmSe or high temp super conductors made by method as –

A) Precursor method

B) Ceramic method

C) Sol-gen method

D) Microwave method

21) Generally, stepwise stability constants gradually decrease. This trend is due to

A) Statistical factor

B) Steric factor

C) electrostatic factor

D) All the above

22) With Kcl & $AgNO_3$ Soln Agcl is formed. This will dissolves in excess of NH_4OH to get clear soln. This method for complexation as –

A) pH method

B) Conductance method

C) Dissolution of insoluble precipitate

D) Migration of species in electric field

23) Faraday's Method……

A) Used for measurements of magnetic susceptibilities

B) Ho . (dH/dx) is kept constant over region

C) Reference used as Hg $[Co(SCN)_4]$

D) A, B, C

24) Related to Job's method ……

A) Also called as continuous variation method

B) Sum of total concentration of M & L kept constant

C) Used for determination of formula & K

D) A, B, C

25) 13CNMR of Fe $(Co)_5$ exhibit signal as –

A) one

B) two

C) five

D) three