IMU-CET SAMPLE QUESTIONS
Chemistry 01

1. A neutral atom $(\text{Atomic no.} > 1)$ consists of
(a) Only protons
(b) Neutrons + protons
(c) Neutrons + electrons
(d) Neutrons + protons + electrons

2. The size of nucleus is of the order of
(a) 10^{-12} m
(b) 10^{-8} m e
(c) 10^{-15} m
(d) 10^{-10} m

3. The electron is
(a) α-ray particle
(b) β-ray particle
(c) Hydrogen ion
(d) Positron

4. The ratio of charge and mass would be greater for
(a) Proton
(b) Electron
(c) Neutron
(d) Alpha

5. The increasing order of the first ionization enthalpies of the elements, B,P,S and F (lowest first) is :
a. F<S<P<B
b. P<S<B<F
c. B<P<S<F
d. B<S<P<F

TMC Shipping Pvt. Ltd.
S.C.O. 270, Sector-14
Panchkula - 134109, India.
www.tmcshipping.in
Contact- 9888384808, 9888394808

6. In which of the following arrangements the order is not according to the properly indicated against it?

a. Li < Na < K < Rb increasing metallic radius
b. I < Br < F < CI increasing electron gain enthalpy (with negative sign.
c. B<C<N<O increasing first ionization enthalpy
d. $\mathbf{Al^{3+} < Mg^{2+} < Na^{+} < F^{-}}$ Increasing ionic size.

7. Identify the correct order of the size of the following

a. $\mathbf{Ca^{2+} < Ar < K^{+} < CI^{-} < S^{2-}}$
b. $Ca^{2+} < K^{+} < Ar < S^{2-} < CI^{-}$
c. $\mathbf{Ca^{2+} < K^{+} < Ar < CI^{-} < S^{2-}}$
d. $Ar < Ca^{2+} + < K^{+} < CI^{-} < S^{2-}$

8. The lanthanide contraction is responsible for the fact that

a. Zr and Y have about same radius
b. Zr and Nb have similar oxidation state
c. Zr and Hf have about same radius
d. Zr and Zn have the same oxidation state

9. Assuming Hund's rule is violated, the bond order and magnetic nature of the diatomic molecule B_2 is

(a) 1 and diamagnetic
(b) 1 and paramagnetic
(c) 0 and diamagnetic
(d) 0 and paramagnetic

10. In which of the following pairs of molecules/ions, the central atoms have sp^2 hybridization?

(a) NH_2^- and H_2O
(b) BF_3 and NH_2^-
(c) NO_2^- and NH_3
(d) BF_3 and NO_2^-

11. In which of the following species the central atom has the type of hybridization which is not the same as that present in the other three?

(a) $SbCI_6^-$
(b) PCI_5
(c) SF_4
(d) I_3^-

12. Which one of the following species does not exist under normal conditions?

(a) B_2
(b) Li_2
(c) B_2^+
(d) Be_2

13. Thermos flask is an example a/an

(a) Open system
(b) Isolated system
(c) Closed system
(d) None of these

14. Boiling water in an open beaker can exchange with surroundings.
(a) Only energy
(b) Only matter
(c) Both these
(d) None of these

15. Water at its freezing point, in a closed insulated vessel, represents a/an
(a) Open system
(b) Heterogeneous system
(c) Closed system
(d) Homogenous system

16. Which one of the following is not a state function?
(a) W
(b) U
(c) H
(e) S

17. Which of the following is amorphous substance
(a) $CuSO_d5H_bO$
(b) NaCl
(c) gelatinous $Al(OH)_c$
(d) AClc

18. The characteristic features of solids are
(a) Definite shape
(b) Definite size,
(c) Definite shape and size
(d) Definite shape, size and rigidity

19. The constituent particles of a solid have
(a) translatory motion only
(b) rotatory motion only
(c) vibratory motion only
(d) all the above types of motion

20. Amorphous substances show (A) Short and long range order (B) Short range order (C) Long range order (D) have no sharp m.p.
(a) A and C are correct
(b) B and C are correct
(c) C and D are correct
(d) B and D are correct

21. A solution is
(a) A mixture of two components
(b) A compound of two components
(c) A homogeneous mixture of two components
(d) All the above

22. Ionic compounds are readily soluble in polar solvents because
(a) They have high solubility in water
(b) Water molecule is polar in nature
(c) Ionic crystals are easily broken down in the polar solvents
(d) Of strong electrostatic forces of attraction between ions of crystals and the polar solvent molecules.

23. In the solution of an ionic solute in a polar solvent, the ions are
(a) Hydrated
(b) Associated with water molecules
(c) Chemically combined with solvent molecules
(d) Solvated

24. Colligative properties of a solution are those, whose values depend in
(a) No. of molecules present in it
(b) No. of ions present in it
(c) No. of particles present in it
(d) None of these

25. The root mean square velocity of an ideal gas at constant pressure varies with density (d) is :
(a) d^2
(b) d
(c) $\sqrt{d}$
(d) $1/\sqrt{d}$

26. The value of gas constant R is :
(a) 0.082 litre atm
(b) 0.987 cal $mol^{-1}K^{-1}$
(c) 8.3 J mol^{-1} K^{-1}
(d) 8 erg mol^{-1} K^{-1}

27. Kinetic theory of gases proves :
    (a) Only Boyle's law
    (b) Only Charle's law
    (c) Only Avogadro's law
    (d) All of these

28. For an ideal gas, the number of mole per litre in terms of its pressure p, gas constant R and temperature T is :
    (a) PT/R
    (b) PRT
    (c) P/RT
    (d) RT/P

29. As compared to potassium sodium has
    (a) Lower electro-negativity
    (b) Higher ionization potential
    (c) Greater atomic radius
    (d) Lower melting point

30. The product obtained on fusion of $BaSO_4$ and Na_2CO_3 is
    (a) $BaCO_3$
    (b) BaO
    (c) $Ba(OH)_2$
    (d) $BaHSO_4$

31. Which is an ore of potassium
    (a) Carnellite
    (b) Cryolite
    (c) Bauxite
    (d) Dolo mite

32. In the case of alkali metals, the covalent character decreases in the order
(a) $MCI > MI > MBr > MF$
(b) $MF > MCI > MBr > MI$
(c) $MF > MCI > MI > MBr$
(d) $MI > MBr > MCI > MF$

33. Aluminium chloride exists as dimer, Al_2Cl_6 in solid state as well as in solution of non polar solvents such as benzene. When dissolved in water, it gives
(a) $[AI(OH)_6]^{3-} + 3HCI$
(b) $[AI(H_2O)_6]^{3+} + 3CI^-$
(c) $Al^3 + 3CI^-$
(d) $Al_2O_3 + 6HCI$

34. Which of the following is only acidic in nature
(a) $Be(OH)_2$
(b) $Mg(OH)_2$
(c) $B(OH)_3$
(d) $AI(OH)_3$

35. Anhydrous $AICI_3$ cannot be obtained from which of the following reactions
(a) Heating $AICI_3 . 6H_2O$
(b) By passing dry HCI over hot aluminium powder
(c) By passing dry Cl_2 over hot aluminium powder
(d) By passing dry Cl_2 over a hot mixture of alumina and coke

36. When Al is added to KOH solution
   (a) No action takes place
   (b) Oxygen is evolved
   (c) Water is produced
   (d) Hydrogen is evolved

37 Knowing that the chemistry of lanthanoids (Ln) is dominated by its +3 oxidation state, which of the following statements is incorrect
   (a) Because of the large size of the Ln (III) ions the bonding in its compounds is predominantly ionic in character.
   (b) The ionic sizes of Ln (III) decrease in general with increasing atomic number.
   (c) Ln(III) compounds are generally colourless
   (d) Ln(III) hydroxides are mainly basic in character

38 In context with the transition elements, which of the following statements, which of the following statements is incorrect.

   (a) In addition to the normal oxidation states, the zero oxidation state is also shown by these elements in complexes.
   (b) In the highest oxidation state, the transition metal show basic character and form cationic complexes
   (c) In the highest oxidation state of the first five transition elements (Sc to Mn), all the 4s and 3d electrons are using for bonding
   (d) Once the d^5 configuration is exceeded, the tendency to involve all the 3d electrons in bonding decreases

39) Highest (+7) oxidation state is shown by
(a) Co
(b) Cr
(c) V
(d) Mn

40) In a reaction the ferrous (Fe^{++}) ion is oxidised to ferric (Fe^{+++}) ion. The equivalent weight of the on in the above reaction is equal to
(a) Half of the atomic weight
(b) 1/5 of the atomic weight
(c) The atomic weight
(d) Twice the atomic weight

41 Which is used as hydrogen generators
(a) $NaH_$
(b) HI
(c) S_6H_3
(d) none of these

42 Which pair does not show hydrogen isotopes
(a) Ortho hydrogen and para hydrogen
(b) Protium and deuterium
(c) Deuterium and tritium
(d) (d) Tritium and protium

43 Among the following, identify the compound which cannot act as both oxidizing and reducing agents

(a) H_2O_2

(b) H_2

(c) SO_2

(d) HNO_2

44 Which of the following reaction produce hydrogen

(a) $Mg + H_2O$

(b) $BaO_2 + HCl$

(c) $H_2S_4O_8 + H_2O$

(d) $Na_2O_2 + 2HCl$

45 In which of the following compound sp^2-hybridization is

(a) $CH \equiv C - CH = CH_2$

(b) $CH \equiv C - CH_2 - CH_3$

(c) $CH_3 - CH = CH_2$

(d) $CH_2 = CH - CH_2 - CH_3$

46 Each carbon atom in benzene is in the state of hybridization.

(a) sp^3

(b) sp^2

(c) sp

(d) s^3p

IMU-CET SAMPLE QUESTIONS
Chemistry 01

47 Number of π bonds in $CH_2 = CH - CH = CH - C \equiv CH$ is

(a) 2

(b) 3

(c) 4

(d) 5

48 In which of the compounds given below is there more than one kind of hybridization (sp, sp^2, sp^3) for carbon

(i) $CH_3CH_2CH_2CH_3$

(ii) $CH_3 - CH = CH - CH_3$

(iii) $CH_2 = CH - CH = CH_2$

(iv) $H - C \equiv C - H$

(a) (ii) and (iv)

(b) (i) and (iv)

(c) (ii) and (iii)

(d) (ii)

49 Which of the following shows a metal being oxidised

(a) $2Na + 2H_2O \rightarrow 2NaOH + H_2$

(b) $Cu \rightarrow Cu^{2+} + 2e^-$

(c) $Cu^{2+} 2e \rightarrow Cu$

(d) Both (a) and (b)

IMU-CET SAMPLE QUESTIONS
Chemistry 01

50 When a sulphur atom becomes a sulphide ion

(a) There is no change in the composition of atom

(b) It gains two electrons

(c) The mass number changes

(d) None of those

1. (D)	11. (A)	21.(C)	31.(A)	41.(A)
2. (C)	12 (D)	22.(D)	32.(D)	42.(A)
3.(B)	13.(B)	23.(D)	33.(B)	43.(B)
4. (B)	14 (C)	24.(C)	34.(C)	44.(A)
5. (D)	15. (B)	25.(D)	35.(A)	45.(B)
6. (B)	16. (A)	26.(A)	36.(D)	46. (B)
7. (C)	17. (C)	27.(D)	37.(C)	47. (C)
8. (C)	18.(D)	28.(C)	38.(B)	48. (D)
9. (A)	19.(C)	29.(B)	39. (D)	49.(D)
10. (A)	20.(D)	30.(A)	40.(C)	50. (B)

TMC Shipping Pvt. Ltd.
S.C.O. 270, Sector-14
Panchkula - 134109, India.
www.tmcshipping.in
Contact- 9888384808, 9888394808