

# IMU-CET SAMPLE QUESTIONS

## Chemistry 04

- An atom which has lost one electron would be
  - Negatively charged
  - Positively charged
  - Electrically neutral
  - Carry double positive charge
- An element has 8 electrons in the valence shell
  - It will lose electron
  - It will gain an electron
  - It neither gains or lose electron
  - It will make bond with itself
- Which of the following particles has more electrons than neutrons.
  - C
  - F
  - $O^{-2}$
  - $Al^{+3}$
- Iso-electronic species are
  - $F^{-}, O^{-2}$
  - $F^{-}, O$
  - $F^{-}, O^{+}$
  - $F^{-}, O^{+2}$
- Which are the following ions has electronic configuration  $[Ar]3d^6$ ?
  - $Fe^{3+}$
  - $Co^{3+}$
  - $Ni^{3+}$
  - $Mn^{3+}$

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6. The correct order of the decreasing ionic radii among the following isoelectronic species is :
- $S^{2-} >, Cl^{-} > K^{+} > Ca^{2+}$
  - $K^{+} >, Ca^{2+} > Cl^{-} > S^{2-}$
  - $Ca^{2+} >, K^{+} > S^{2-} > Cl^{-}$
  - $Cl^{-} >, C^{2-} > Ca^{2+} > K^{+}$
7. General electronic configuration of lanthanides is
- $(n-2)f^{1-14}(n-1)s^1p^6d^{0-1}ns^2$
  - $(n-2)f^{10-14}(n-1)d^{10-1}ns^2$
  - $(n-2)f^{0-14}(n-1)d^{10}ns^2$
  - $(n-2)d^{0-1}(n-1)f$
8. The correct order of first ionization potential among Be, B, C, N and O is
- $B < Be < C < O < N$
  - $B < Be < C < N < O$
  - $Be < B < C < N < O$
  - $Be < B < C < O < N$
9. The maximum number of hydrogen bonds a water molecule can form is
- 2
  - 4
  - 3
  - 1

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10. Which one of the following pairs of molecules will have permanent dipole moments for both members
- (a)  $\text{SiF}_4$  and  $\text{NO}_2$
  - (b)  $\text{NO}_2$  and  $\text{CO}_2$
  - (c)  $\text{NO}_2$  and  $\text{O}_3$
  - (d)  $\text{SiF}_4$  and  $\text{CO}_2$
11. The correct order of bond angles (smallest first) in  $\text{H}_2\text{S}$ ,  $\text{NH}_3$ ,  $\text{BF}_3$  and  $\text{SiH}_4$  is
- (a)  $\text{H}_2\text{S} < \text{SiH}_4 < \text{NH}_3 < \text{BF}_3$
  - (b)  $\text{NH}_3 < \text{H}_2\text{S} < \text{SiH}_4 < \text{BF}_3$
  - (c)  $\text{H}_2\text{S} < \text{NH}_3 < \text{SiH}_4 < \text{BF}_3$
  - (d)  $\text{H}_2\text{S} < \text{NH}_3 < \text{BF}_3 < \text{SiH}_4$
12. Which one of the following has the regular tetrahedral structure?
- (a)  $\text{XeF}_4$
  - (b)  $\text{SF}_4$
  - (c)  $\text{BF}_4^-$
  - (d)  $\text{Ni}(\text{CN})_4^{2-}$
13. The work done when an ideal gas expands from  $5\text{dm}^3$  to  $15\text{dm}^3$  against a constant pressure of 200 kPa, is
- (a) - 4 kJ
  - (b) 2000 kJ
  - (c) -2 kJ
  - (d) -5 kJ

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14. The process accompanied by no change in internal energy is
- (a) isothermal
  - (b) Adiabatic
  - (c) Cyclic
  - (d) Both (a) and (c)
15. In an adiabatic change  $\Delta U$  is equal to
- (a)  $-P\Delta V$
  - (b)  $W$
  - (c)  $q$
  - (d) zero
16. A gas absorbs 1000 J of heat when 600 J of work is done by the gas. If initial internal energy of the gas is 200 J, its final internal energy would be
- (a) 600 J
  - (b) 400 J
  - (c) 200 J
17. If heat is supplied to a pure substance which is just beginning to melt, the
- (a) critical temperature will rise
  - (b) temperature will remain constant
  - (c) temperature will immediately rise
  - (d) temperature will fall

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18. An example of a covalent crystalline solid is

- (a) Si
- (b) NaF
- (c) Ar
- (d) Al

19. ZnS is an example of

- (a) Ionic crystal
- (b) Covalent crystal
- (c) Molecular crystal
- (d) Metallic crystal

20. LiF is an example of

- (a) Ionic crystal
- (b) Metallic crystal
- (c) Covalent crystal
- (d) Molecular crystal

21. The factor  $\Delta T_b/K_b$  is equal to

- (a) Molality
- (b) Molarity
- (c) Mole fraction
- (d) None of these

22. Isotonic solutions have same

- (a) Osmotic pressure
- (b) Temperature
- (c) Molar concentration
- (d) All these

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23. The relative lowering of vapour pressure in a dilute solution is directly proportional to
- Molarity
  - Molality
  - Mole fraction of solute
  - All these
24. In the case of osmosis, the solvent molecules move from the solution of
- Higher V.P. to that of lower V.P.
  - Higher concentration to that of lower concentration
  - Lower V.P. to that of higher V.P.
  - Higher O.P. to that of lower O.P.
25. According to the kinetic theory of gases, in an ideal gas, between two successive collisions a gas molecule travels:
- In a circular path
  - In a wavy path
  - In a straight line path
  - With an accelerated velocity
26. At STP, the order of root mean square speed of molecules  $H_2, N_2, O_2$  and HBr is :
- $H_2 > N_2 > O_2 > HBr$
  - $HBr > O_2 > N_2 > H_2$
  - $HBr > H_2 > O_2 > N_2$
  - $N_2 > O_2 > H_2 > HBr$

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27. The average kinetic energy of an ideal gas per molecule in SI units at 25 °C will be:
- (a)  $6.17 \times 10^{-21}$  kJ
  - (b)  $6.17 \times 10^{-21}$  J
  - (c)  $6.17 \times 10^{-20}$  J
  - (d)  $7.16 \times 10^{-20}$  J
28. Which is not correct of gases :
- (a) Gases have no definite shape and volume.
  - (b) Volume of gas is equal to the volume of container confining the gas.
  - (c) Confined gas exerts uniform pressure on the walls of its container in all directions.
  - (d) None
29. The alkali metals form salt-like hydrides by the direct synthesis at elevated temperature. The thermal stability of these hydrides decreases in which of the following orders
- (a)  $\text{NaH} > \text{LiH} > \text{KH} > \text{RbH} > \text{CsH}$
  - (b)  $\text{LiH} > \text{NaH} > \text{KH} > \text{RbH} > \text{CsH}$
  - (c)  $\text{CsH} > \text{RbH} > \text{KH} > \text{NaH} > \text{LiH}$
  - (d)  $\text{KH} > \text{NaH} > \text{LiH} > \text{CsH} > \text{RbH}$
30. Sodium thiosulphate is used in photography
- (a) To convert metallic silver into silver salt.
  - (b) AgBr grain is reduced to non metallic silver.
  - (c) To remove reduced silver
  - (d) To remove unrecompensed AgBr in the form of  $\text{Na}_3[\text{Ag}[\text{S}_2\text{O}_3]_2]$   
(a complex salt)

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31. When sodium is heated with moist air, then the product obtained is
- $\text{Na}_2\text{O}$
  - $\text{NaOH}$
  - $\text{Na}_2\text{CO}_3$
  - $\text{Na}_2\text{O}_2$
32. The solubility of the alkali metal carbonates
- Increase a first and then decreases
  - does not show regular variation
  - Increase as we go down the group
  - decrease as we go down the group
33. Boron shows single oxidation state due to absence of
- Inert pair effect
  - Screening effect
  - Istope effect
  - None of these
34. Which of the following is non-existent
- $\text{AlF}_6^{3-}$
  - $\text{CoF}_6^{3-}$
  - $\text{BF}_6^{3-}$
  - $\text{SiF}_6^{2-}$
35. Carbon and silicon belong to (IV) group. The maximum coordination number of carbon in community occurring compounds is 4, whereas that of silicon is 6. This is due to
- Large size of silicon
  - More electropositive nature of silicon
  - Availability of low lying d-orbitals in silicon



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(d) Both (a) and (b)

36. Which one of the following anions is present in the chain structure of silicates

- (a)  $\text{Si}_2\text{O}_7^{6-}$
- (b)  $(\text{Si}_2\text{O}_5^{2-})_m$
- (c)  $(\text{SiO}_3^{2-})_m$
- (d)  $\text{SiO}_4^{4-}$

37. A transition element X has a configuration  $[\text{Ar}]3d^4$  in its + 3 oxidation state. Its atomic number is

- (a) 25
- (b) 26
- (c) 22
- (d) 19

38. Zinc and mercury do not show variable valency like d-block elements because

- (a) They are soft
- (b) Their d-shells are complete
- (c) They have any two electrons in the outermost subshell
- (d) Their d-shells are incomplete

39. Transition metals are related to which block

- (a) s-block
- (b) p-block
- (c) d-block
- (d) none of these

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40. The electronic configuration  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9$  represents a
- Metal atom
  - Non-metal atom
  - Non metallic anion
  - Metallic cation
41. Which position for hydrogen explain all its properties
- At the top of halogen
  - At the top of alkali metals
  - At the top of carbon family
  - None of these
42. Which element forms maximum compound in chemistry
- O
  - H
  - Si
  - C
43. Which of the following statements concerning protium, deuterium and tritium is not true
- They are isotopes of each other
  - they have similar electronic configurations
  - They exist in the nature in the ratio of 1 : 2 : 3
  - Their mass numbers are in the ratio of 1 : 2 : 3
44. Pure hydrogen is obtained by carrying electrolysis of
- Water containing  $H_2SO_4$
  - Water containing NaOH
  - $Ba(OH)_2$  solution
  - KOH solution

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45. Strongest nucleophile is

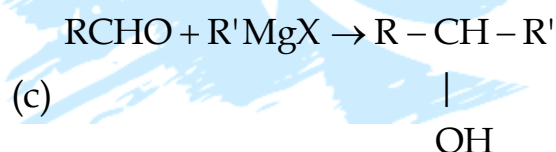
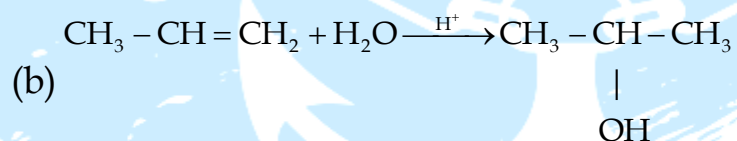
- (a)  $\text{RNH}_2$
- (b)  $\text{ROH}$
- (c)  $\text{C}_6\text{H}_5\text{O}^-$
- (d)  $\text{CH}_3\text{O}$

46. The order of decreasing reactivity towards an electrophilic reagent, for the following

- (i) Benzene
- (ii) Toluene
- (iii) Chlorobenzene and
- (iv) Phenol would be

- (a)  $\text{A} > \text{B} > \text{C} > \text{D}$
- (b)  $\text{B} > \text{D} > \text{A} > \text{C}$
- (c)  $\text{D} > \text{C} > \text{B} > \text{A}$
- (d)  $\text{D} > \text{B} > \text{A} > \text{C}$

47. Which one is a nucleophilic substitution reaction among the following



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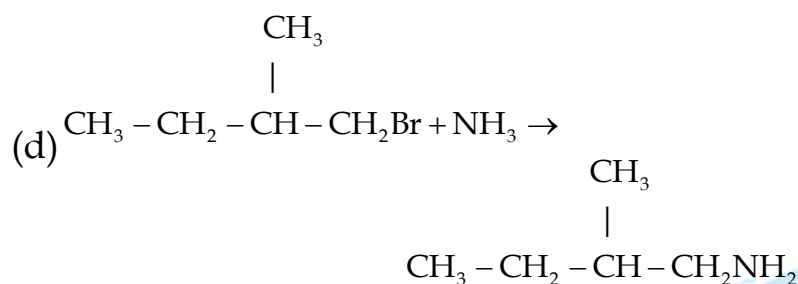
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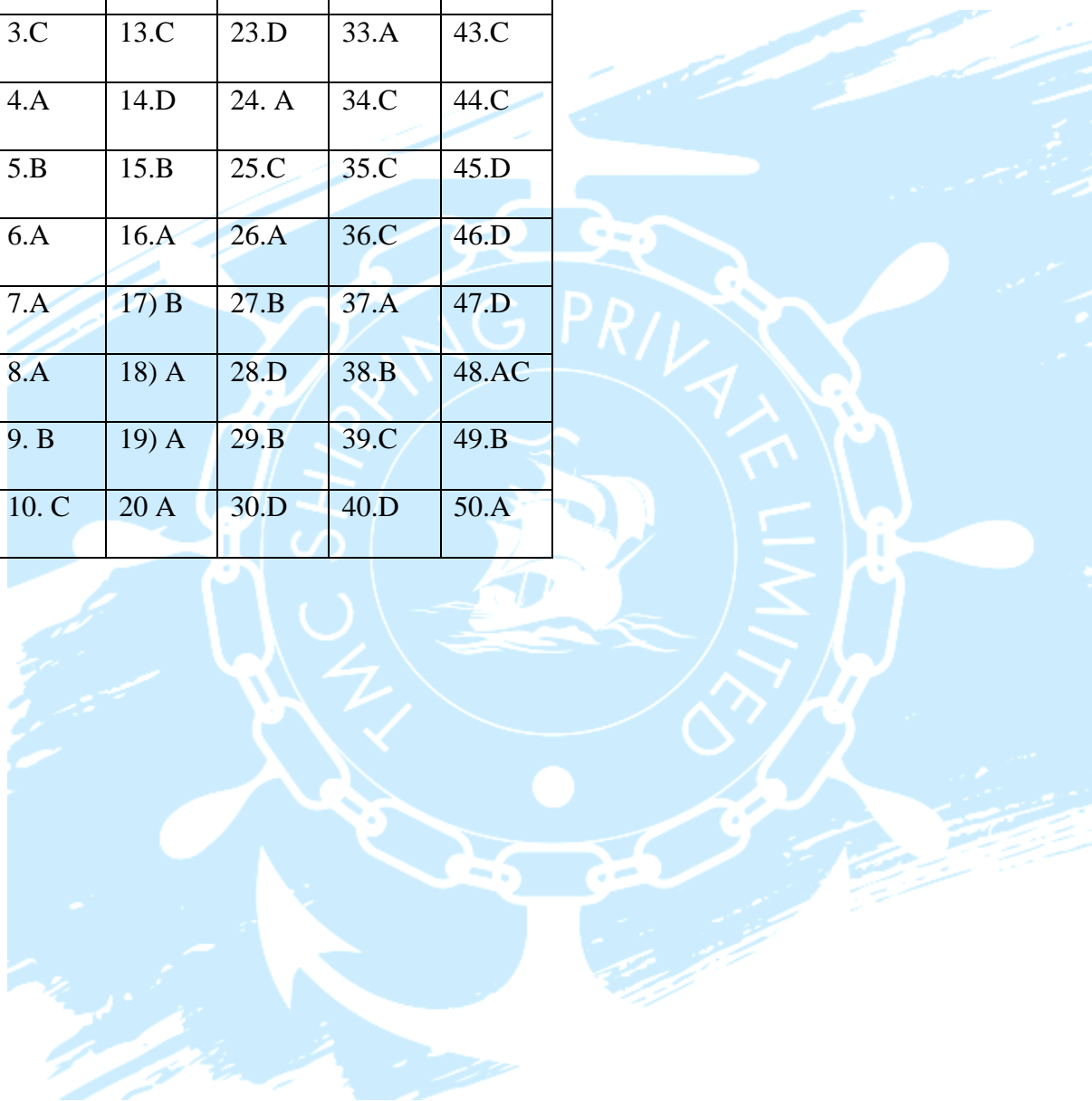


48. Which one of the following exhibits geometrical isomerism
- (a) 1,2-dibromopropene
  - (b) 2,3-dimethylbut-2-ene
  - (c) 2,3-dibromobut-2-ene
  - (d) 2-methylbut-2-ene
  - (e) 2,3-dibromobut-1-ene
49. Following reaction describes the rusting of iron
- $$4\text{Fe} + 3\text{O}_2 \rightarrow 4\text{Fe}^{3+} + 6\text{O}^{2-}$$
- Which one of the following statement is incorrect
- (a) This is an example of a redox reaction
  - (b) Metallic iron is reduced to  $\text{Fe}^{3+}$
  - (c)  $\text{Fe}^{3+}$  is an oxidizing agent
  - (d) Metallic iron is a reducing agent
50. Oxidation involves
- (a) Loss of electrons
  - (b) Gain of electrons
  - (c) Increase in the valency of negative part
  - (d) Decrease in the valency of positive part

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



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