

IMU-CET SAMPLE QUESTIONS

Chemistry 02

- The density of neutrons is of the order
 - 10^3 kg/cc
 - 10^6 kg/cc
 - 10^9 kg/cc
 - 10^{11} kg/cc
- Which is not isoelectronic with the other three
 - CO
 - NO^+
 - CN^-
 - O_2
- If W is atomic weight and N is the atomic number of an element, then
 - Number of $e^- = W - N$
 - Number of ${}_0n^1 = W - N$
 - Number of ${}_1\text{H}^1 = W - N$
 - Number of ${}_0n^1 = N$
- Which of the following are isoelectronic with one another
 - Na^+ and Ne
 - K^+ and O
 - Ne and O
 - Na^+ and K^+
- Which of the following is the main cause of lanthanide contraction:
 - Poor shielding of one of 4f electrons by another in the subshell
 - Effective shielding of one of 4f electrons by another in the subshell
 - Poorer shielding of 5d electrons by 4f electrons
 - Greater shielding of 5 d electrons by 4f electrons

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6. Of following sets which one does not contain isoelectronic species?
- $\text{BO}_3^{3-}, \text{CO}_3^{3-}, \text{NO}_3^{1-}$
 - $\text{SO}_3^{2-}, \text{CO}_3^{2-}, \text{NO}_3^-$
 - $\text{CN}^-, \text{N}_2, \text{C}_2^{2-}$
 - $\text{PO}_4^{3-}, \text{SO}_4^{2-}, \text{ClO}_4^-$
7. Which one of the following sets represent isoelectronic species?
- $\text{K}^+, \text{Cl}^-, \text{Ca}^{2+}, \text{Sc}^{3+}$
 - $\text{Ba}^{2+}, \text{Sr}^{2+}, \text{K}^+, \text{Ca}^{2+}$
 - $\text{N}^{3-}, \text{O}^{2-}, \text{F}^-, \text{S}^{2-}$
 - $\text{Li}^+, \text{Na}^+, \text{Mg}^{2+}, \text{Ca}^{2+}$
8. Which one of the following constitute a group of isoelectronic species
- $\text{N}_2, \text{O}_2, \text{Na}^+, \text{CO}$
 - $\text{C}_2^{2-}, \text{O}_2, \text{CO}, \text{NO}$
 - $\text{NO}^+, \text{C}_2^{2-}, \text{CN}^-, \text{N}_2$
 - $\text{CN}^-, \text{N}_2, \text{O}_2^{2-}, \text{C}_2^{2-}$
9. The correct order of increasing bond angle in the following species is
- $\text{Cl}_2\text{O} < \text{ClO}_2^- < \text{ClO}_2$
 - $\text{ClO}_2^- < \text{Cl}_2\text{O} < \text{ClO}_2$
 - $\text{Cl}_2\text{O} < \text{ClO}_2 < \text{ClO}_2^-$
 - $\text{ClO}_2 < \text{Cl}_2\text{O} < \text{ClO}_2^-$

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10. The bond order of CO molecule is
- (a) 2
 - (b) 2.5
 - (c) 3
 - (d) 3.5
11. In which of the following molecules is hydrogen bridge bond present?
- (a) Water
 - (b) Inorganic benzene
 - (c) Diborane
 - (d) Methanol
12. What type of orbital hybridization is considered on P in PCl_5 ?
- (a) sp^3d
 - (b) dsp^3
 - (c) sp^3d^2
 - (d) d^2sp^3
13. Among the following, the state function(s) is/are
- (a) W
 - (b) G
 - (c) q_{rev}/T
 - (d) both (b) and (c)
14. Which one of following groups includes all extensive properties?
- (a) Volume, Energy, , entropy
 - (b) Energy, pressure, volume
 - (c) Pressure, b.pt, density
 - (d) Mass, volume, pressure

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15. Which one of the following groups includes two intensive properties and one extensive property?
- (a) Mass, energy, volume
 - (b) Pressure, b.pt. energy
 - (c) Surface tension, b.pt. ,fpt
 - (d) Sp.heat, volume, mass
16. For an isothermal process,
- (a) $T = 0$
 - (b) $U = 0$
 - (c) $\Delta U = 0$
17. Which of the following is not a characteristic of crystalline solids?
- (a) They have a regular geometry
 - (b) They have sharp melting points
 - (c) They are isotropic
 - (d) They undergo a clean cleavage
18. When molten form of crystalline solid is rapidly cooled, it changes into
- (a) crystalline solid
 - (b) amorphous solid
 - (c) insulator
 - (d) superconductor

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19. Which among the following will show anisotropy?
- (a) Glass
 - (b) Barium chloride
 - (c) Wood
 - (d) Paper
20. Amorphous solids are
- (a) Solid substances in real sense
 - (b) Liquids in real sense
 - (c) Supercooled liquids
 - (d) Substances with definite M.P.
21. The value of molal depression constant depends on
- (a) Nature of solute
 - (b) Nature of solvent
 - (c) Amount of solvent
 - (d) Temperature of solution
22. Osmosis is the flow, through semipermeable membrane, of
- (a) Solvent molecules from pure solvent to solution
 - (b) Solvent molecules from a solution of lower concentration to that at higher concentration
 - (c) Solute molecules from a solution of higher concentration to that at lower concentration
 - (d) Both a and b above

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23. Osmotic pressure is defined as
- (a) The excess pressure which must be applied to a solution to stop osmosis
 - (b) The excess pressure which must be applied to a solution to increase its vapour pressure till it becomes equal to the vapour pressure of pure solvent
 - (c) The decrease in pressure on the pure solvent to decrease its vapour pressure till it becomes equal to the vapour pressure of solution
 - (d) All of the above
24. The isotonic solutions have same
- (a) Molarities
 - (b) Osmotic pressures
 - (c) Temperatures
 - (d) Both b and c
25. As the temperature is raised from 20 °C to 40 °C, the average kinetic energy of neon atoms changes by a factor of which of the following?
- (a) $\frac{1}{2}$
 - (b) $\sqrt{313/293}$
 - (c) 313/293
 - (d) 2
26. In van der Waals' equation of state of the gas law, constant 'b' is a measure of :
- (a) Intermolecular repulsions
 - (b) Inter molecular attraction
 - (c) Volume occupied by the molecules
 - (d) Inter molecular collision per unit volume

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27. Which of the following statements is not true about the effect of an increase in temperature on the distribution of molecular speeds in a gas :
- (a) The most probable speed increases
 - (b) The fraction of the molecules with most probable speed increases
 - (c) The distribution becomes broader
 - (d) The area under the distribution curve remains the same as under the lower temperature
28. Equal masses of methane and oxygen are mixed in an empty container at 25°C. The fraction of the total pressure exerted by oxygen is:
- (a) $1/3$
 - (b) $1/2$
 - (c) $2/3$
 - (d) $\frac{1}{3} \times \frac{273}{278}$
29. Correct order of increasing activity is
- (a) Cu, Mg, Na
 - (b) Na, Mg, Cu
 - (c) Mg, Na, Cu
 - (d) Cu, Na, Mg
30. The reagent commonly used to determine hardness of water titrimetrically is
- (a) Oxalic acid
 - (b) Disodium salt of EDTA
 - (c) Sodium citrate
 - (d) Sodium thiosulphate

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31. Potash alum is a
- (a) Complex salt
 - (b) Acid salt
 - (c) Double salt
 - (d) Normal salt
32. The most stable compound is
- (a) LiF
 - (b) LiCl
 - (c) LiBr
 - (d) LiI
33. Aluminium (III) chloride forms a dimer because
- (a) Higher coordination number can be achieved by aluminium
 - (b) Aluminium has high ionization energy
 - (c) Aluminium belongs to III group
 - (d) It cannot form a trimer
34. Number of water molecules in Mohr's salt is
- (a) 7
 - (b) 6
 - (c) 5
 - (d) 8
35. Al_2O_3 can be converted to anhydrous AlCl_3 by heating
- (a) A mixture of Al_2O_3 and carbon in dry Cl_2 gas
 - (b) Al_2O_3 with Cl_2 gas
 - (c) Al_2O_3 with HCl gas
 - (d) Al_2O_3 with NaCl in solid gas

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36. Boron cannot form which one of the following anionic
- (a) BF_6^{3-}
 - (b) BH_4^-
 - (c) $\text{B}(\text{OH})_4^-$
 - (d) BO_2^-
37. Which of the following configuration is that of a coinage metal
- (a) 2,8,1
 - (b) 2,8,18,1
 - (c) 2,8,8
 - (d) 2,18,8,3
38. Identify the incorrect statement among the following
- (a) There is decrease in the radii of atoms or ion as one proceeds from La to Lu.
 - (b) Lanthanoid contraction is the accumulation of successive shrinkages
 - (c) As a result of lanthanide contraction, the properties of the 4th series of the contraction element have no similarities with the 5^d series of elements
 - (d) Shielding power of 4f element of electron is quite weak.
39. Which ion has maximum magnetic moment
- (a) V^{+3}
 - (b) Mn^{+3}
 - (c) Fe^{+3}
 - (d) Cu^{+2}

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40. The general electronic configuration of transition elements is
- (a) $(n-1)d^{1-5}$
 - (b) $(n-1)d^{1-10}ns^{-1}$
 - (c) $(n-1)d^{1-10}ns^{1-2}$
 - (d) $ns^2(n-1)d^{10}$
41. The adsorption of hydrogen by metals is called
- (a) Dehydrogenation
 - (b) Hydrogenation
 - (c) Occlusion
 - (d) Absorption
42. In context with the industrial preparation of hydrogen from water gas ($CO + H_2$), which of the following caustic soda solution is
- (a) CO is removed by absorption in aqueous Cu_2Cl_2 solution
 - (b) H_2 is removed through occlusion with Pd
 - (c) CO is oxidized to CO_2 with steam in the presence of a catalyst followed by absorption of CO_2 in alkali
 - (d) CO and H_2 are fractionally separated using differences in their densities
43. Which is poorest reducing agent
- (a) Nascent hydrogen
 - (b) Atomic hydrogen
 - (c) dihydrogen
 - (d) All have same reducing strength

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44. Spin isomerism is shown by
(a) Dichloro benzene
(b) Hydrogen
(c) Dibasic acid
(d) n-butane
45. The number of σ bonds in o-xylene is
(a) 6
(b) 9
(c) 12
(d) 18
46. Maximum bond energy of C-H bonds is found in the compound
(a) Ethane
(b) Ethene
(c) Ethyne
(d) Equal in all the three
47. The types of hybridization present in 1,2-butadiene are
(a) sp, sp^2 and sp^3
(b) sp^2 and sp^3
(c) sp^2 and sp
(d) sp and sp^3
48. Which one of the following does not have sp^2 hybridized carbon
(a) Acetonitrile
(b) Acetic acid
(c) Acetone
(d) Acetamide

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49. When P reacts with caustic soda, the products are PH_3 and NaH_2PO_2 . This reaction is an example of
- Oxidation
 - Reduction
 - Oxidation and reduction (Redox)
 - Neutralization
50. Which one of the following does not get oxidized by bromine water
- Fe^{+2} to Fe^{+3}
 - Cu^+ to Cu^{+2}
 - Mn^{+2} to MnO_4^-
 - Sn^{+2} to Sn^{+4}

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

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