

F.Y.B.Sc. Semester-1 Chemistry Paper-I Sample questions

Inorganic Chemistry :

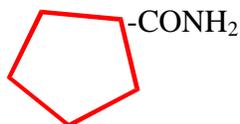
- Which of the following have highest atomic radius?
  - Cs
  - K
  - Rb
  - Li
- Average of ionization energy and electron affinity is the electronegativity is suggested by-----
  - Mulliken
  - Pauling
  - Allered Rowchow
  - Bhor
- Spectral series with  $n=2,3,4,5,\dots$  to  $n=1$  is known as-----
  - Lyman
  - Paschen
  - Bracket
  - Pfund
- If the Azimuthal quantum number value is 3 then it belongs to-----orbital.
  - s
  - d
  - f
  - p
- Which of the following formula can be used to calculate number of nodes?
  - $n-l-0$
  - $n-l-3$
  - $n-l-2$
  - $n-l-1$
- According to Quantum theory-----
  - $E=h\nu$
  - $E=hc$
  - $E=h/2\pi$
  - $E=h/2\phi$
- For 1s orbital  $D=\text{maximum}$  is at-----
  - $0.529A^0$
  - $2 \times 0.529A^0$
  - $5 \times 0.529A^0$
  - $3 \times 0.529A^0$

8. Radial part of wave function determines-----
- Size of orbital
  - Shape of orbital
  - Energy of orbital
  - Location of orbital
9. Splitting of spectral lines in presence of magnetic field is known as-----
- Stark effect
  - Zeeman effect
  - Duality
  - Photon effect
10. Dual nature of electrons is explained by-----
- Bohr
  - Louis de Broglie
  - Dalton
  - Rutherford
11. Which of the following explains Plancks Quantum theory?
- $E=h\nu$
  - $E=hc$
  - $E=h\eta$
  - $E=h/2\pi$
12. Bohr could not explain the spectral lines of-----
- $\text{He}^+$
  - $\text{N}^{+2}$
  - H
  - $\text{Li}^{+2}$
13. If all other factors are equal ionization enthalpy value will be grater for-----
- s orbital
  - p orbital
  - d orbital
  - f orbital
14. Which is probable second ionization potential of Li, if first ionization potential is 520 KJ/mol ?
- 496 kJ/mol
  - 7296 kJ/mol
  - 419 kJ/mol
  - 550 kJ/mol

15. Calculate electronegativity of F atom, given that ionization energy of F atom is 17.41 Ev and electron affinity of F atom is 3.45 Ev.
- a) 4.11
  - b) 4.32
  - c) 4.07
  - d) 4.50
16. Calculate the electronegativity of leads by using Allerd Rochow method if Atomic radius of oxygen is  $0.77 \text{ \AA}$  (Atomic number of O=8).
- a) 3.1
  - b) 3.5
  - c) 3.3
  - d) 3.6
17. Calculate electronegativity of Chlorine by using Pauling's method. Given bond dissociation energies of H-H, Cl-Cl, HCl are 436, 241,432 kj/mol. Electronegativity of hydrogen is 2.1.
- a) 3.0
  - b) 3.5
  - c) 1.8
  - d) 3.8
18. Calculate effective nuclear charge for 4s electron of Fe ( $z=26$ ).
- a) 13.9
  - b) 9.2
  - c) 3.75
  - d) 3.55
19. Which of the following element shows zero electron affinity?
- a) B
  - b) Al
  - c) Mg
  - d) C
20. Theory of atomic structure based on quantum mechanics is proposed by-----
- a) Rutherford
  - b) Louis de Broglie
  - c) Dalton
  - d) Neil Bohr

## Organic Chemistry:

- IUPAC name of  $\text{OHC-CH}_2\text{-CH}_2\text{-CHO}$  .....
  - Ethanedial
  - Butanedial
  - Ethenediol
  - Butenediol
- IUPAC name of  $\text{CH}_3\text{-CO-O-CO-CH}_3$  .....
  - Methanoic anhydride
  - Ethanoic anhydride
  - Methanoic ethanoic anhydride
  - Butanoic anhydride
- IUPAC name of  $\text{CH}_3\text{-O-CH}_2\text{-CH}_3$ 
  - Ethoxy methane
  - Methoxy ethane
  - Ethyl methyl ether
  - Methyl ethyl ether
- IUPAC name of  $\text{CH}_3\text{-CH}_2\text{-NH-C}_2\text{H}_5$ 
  - N- Ethyl ethanamine
  - N- Ethyl ethanamide
  - Diethylamine
  - Ethanenitrile
- The structure of Ethanenitrile .....
  - $\text{CH}_3\text{-CH}_2\text{-CN}$
  - $\text{CH}_3\text{-CN}$
  - $\text{CH}_3\text{-CH}_2\text{-NH}_2$
  - $\text{CH}_3\text{-CH}_2\text{-N=NH}$
- The structure of 2-butenal .....
  - $\text{OHC-CH=CH- CH}_3$
  - $\text{OHC-CH=CH- CHO}$
  - $\text{OHC-CH=CH- CH}_2\text{-OH}$
  - $\text{OHC-CH=CH- CH}_2\text{- CH}_3$
- IUPAC name of



- Cyclopentane carboxamide
- Cyclopentanamine
- Cyclopentanenitrile
- cyclopentanal

8. Functional group of Primary amine is .....
- $-\text{NH}_3$
  - $-\text{NH}_2$
  - $-\text{CONH}_2$
  - $-\text{CN}$
9. Which of the following alkyl carbocation is most stable?
- Primary
  - Secondary
  - Tertiary
  - Methyl
10. The shape of carbanion is .....
- Tetrahedral
  - Pyramidal
  - Trigonal planar
  - Linear
11. Which of the following is a Lewis acid?
- $\text{NH}_3$
  - $\text{BF}_3$
  - $\text{OH}^-$
  - Carbanion
12. Homolytic fission of single covalent bond gives .....
- Cation
  - Anion
  - Cation as well as anion
  - Free radical
13. Which of the following group has + I inductive effect?
- $-\text{Cl}$
  - $-\text{OH}$
  - $-\text{Br}$
  - $-\text{CH}_3$
14. Hybridization of carbon in ethane is .....
- $\text{SP}^3$
  - $\text{SP}^2$
  - $\text{SP}$
  - $\text{SP}^3\text{d}$
15. Tetrahedral bond angle is ....
- $108^\circ$
  - $120^\circ$
  - $109^\circ 28'$
  - $104^\circ 5'$

16.  $\Pi$ -bond is formed by .....
- Lateral overlapping
  - End to end overlapping
  - Axial overlapping
  - Co-axial overlapping
17. In double bond, number of sigma bonds is/are .....
- One
  - Two
  - One or two
  - Zero
18. In ethane, C-C bond is formed between ..... and ..... hybridized carbons.
- $SP^3$  and  $SP^3$
  - $SP^3$  and  $SP^2$
  - $SP$  and  $s$
  - $SP^3$  and  $SP$
19. Free radical is species with .....
- Positive charge
  - Negative charge
  - One odd electron
  - Lone pair of electron
20.  $CH_2=CH_2 + H_2 \longrightarrow CH_3-CH_3$  is a type of ..... reaction
- Addition
  - Substitution
  - Elimination
  - Rearrangement

**Physical chemistry:**

1. An endothermic reaction is one, which occurs .....
  - a) With evolution of heat
  - b) with absorption of heat
  - c) in forward direction
  - d) none of these
2. Enthalpy is.....
  - a) Heat content
  - b) internal energy
  - c) potential energy
  - d) kinetic energy
3. The equation  $C + O_2 \rightarrow CO_2$  ( $\Delta H = -408\text{KJ}$ ) represent .....reaction.
  - a) Endothermic
  - b) Exothermic
  - c) Reversible
  - d) redox
4. The enthalpy of system is represented by .....
  - a) H
  - b)  $P\Delta V$
  - c)  $\Delta E$
  - d)  $\Delta V$
5. Which of the following is extensive property.....
  - a) Mass
  - b) Density
  - c) Concentration
  - d) volume
6. The system which exchange both energy and matter with surrounding is .....
  - a) Open
  - b) Closed
  - c) Isolated
  - d) none of these
7. For cyclic process.....
  - a)  $\sum \Delta E = 0$
  - b)  $\sum \Delta E < 0$
  - c)  $\sum \Delta E > 0$
  - d)  $\sum \Delta E = 1$

8. Heat of formation is represented by .....
- $\Delta f$
  - $\Delta H_f$
  - $H_f$
  - $H\Delta f$
9. The factor  $E+PV$  is known as .....
- Heat content
  - Change in enthalpy
  - Work done
  - none of these
10. State function are.....
- Path dependent
  - inexact differentials
  - path independent
  - exact differential
11. With increase in temperature, which of these changes?
- Molality
  - Fraction of solute present in water
  - Weight fraction of solute
  - Mole fraction
12. The density of a solution prepared by dissolving 120 g of urea (mol.mass = 60 u) in 1000 g of water is 1.15 g/mL. The molarity of this solution is:
- 1.02 M
  - 2.05 M
  - 0.50 M
  - 1.78 M
13. A 5.2 molal aqueous solution of methyl alcohol,  $\text{CH}_3\text{OH}$  is supplied. What is the mole fraction of methyl alcohol in the solution?
- 0.050
  - 1.100
  - 0.190
  - 0.086
14. Number of moles corresponding to 90g of water is.....
- 3
  - 5
  - 2
  - 4

15. Molar heat capacity is.....

- a) Extensive property
- b) Intensive property
- c) state function
- d) none of these

16. Density of a 2.05 M solution of acetic acid in water is 1.02 g/mL. The molality of the solution is:

- a) 1.14 mol kg<sup>-1</sup>
- b) 3.28 mol kg<sup>-1</sup>
- c) 2.28 mol kg<sup>-1</sup>
- d) 0.44 mol kg<sup>-1</sup>

17. Molecular weight of Na<sub>2</sub>CO<sub>3</sub>.....

- a) 90
- b) 110
- c) 106
- d) 65

18. KOH is .....

- a) Monoacidic
- b) Diacidic
- c) Triacidic
- d) none of these

19. 1 ppm = .....

- a) 1x 10<sup>6</sup>
- b) 1x 10<sup>9</sup>
- c) 1x 10<sup>7</sup>
- d) 1x 10<sup>5</sup>

20. If the matter and energy both can pass across the boundary the system is called

as.....

- a) Open system
- b) Closed system
- c) Isolated system
- d) none of these