

**S Y B Sc**  
**SEM III**  
**Chemistry paper -II**  
**Sample Questions**  
**Exam Mission 2020**

**PHYSICAL CHEMISTRY (Unit I)**

**Chapter: 1.1 Chemical Kinetics**

**1.2 Solutions**

- 1)  $2\text{HI} \rightleftharpoons \text{H}_2 + \text{I}_2$  is the example of -----
  - a) Reversible reaction /opposing reaction
  - b) Consecutive reaction
  - c) Parallel reaction
  - d) Irreversible reaction
- 2) Thermal Chain reaction involve the steps -chain initiation, chain Propagation and -----
  - a) Chain termination
  - b) Chain elongation
  - c) Chain branching
  - d) Chain transformation
- 3)  $\text{CH}_3\text{-O-CH}_3 \rightleftharpoons \text{CH}_4 + \text{HCHO}$        $\text{H}_2 + \text{CO}$  is the example of
  - a) Reversible reaction /opposing reaction ‘
  - b) Consecutive reaction
  - c) Parallel reaction
  - d) Irreversible reaction
- 4) Only those collisions taking place between molecules in proper----- and possessing certain minimum amount of energy can lead to the formation of products.
  - a) Orientation ‘
  - b) Shape
  - c) Size
  - d) Geometry
- 5) In an expression for Arrhenius equation  $K = A.e^{-E_a/RT}$  the term  $RT$  is -----
  - a) Average kinetic energy
  - b) Frequency factor
  - c) Rate constant
- 6) Graph showing Maxwell Boltzmann distribution of velocities have ----- on x axis
  - a) Molecular velocity .
  - b) Fraction of molecules
  - c) Activation energy
  - d) Energy
- 7) The minimum energy requirement that must be met for a chemical reaction to occur is called as-----
  - a) Energy of activation
  - b) Kinetic energy
  - c) Potential energy
  - d) Reaction energy

8) In Expression for The no of molecules colliding molecules per second per cubic centimeter –

$$Z = n_1 n_2 \sigma_{1.2}^2 \left( \frac{8RT}{\pi} \left[ \frac{M_1 + M_2}{M_1 M_2} \right] \right)^{1/2}$$

(the term  $\mu$  denotes ----- .

- a).Reduced mass
  - b).Collision diameter
  - c) Molecular weights
  - d) Collision radius
- 9) As temperature increases reaction rate also -----
- a) **increases**
  - b) decreases
  - c) remains constant
  - d) remains unaffected
- 10) Nitration of Phenol is an example of -----reaction .
- a) Reversible reaction /opposing reaction
  - b) Consecutive reaction
  - c) **Parallel reaction**
  - d) Irreversible reaction
- 11) A solute Obeys distribution law in a given pair of invisible solvent if it remains in the same -----
- a) **Molecular state**
  - b) Atomic state
  - c) Ionic state
  - d) Radical state
- 12) Distribution law is applicable when temperature is -----
- a) **Constant**
  - b) Increases
  - c) Decreases
  - d) Changes
- 13) Positive deviation depend on following factor-----
- a) **Polarity of molecule)**
  - b) Composition of the molecules
  - c) Temperature
  - d) Pressure
- 14) When total vapour pressure of non ideal solution is less than the total vapour pressure value obtained by applying without flaw -----deviation is observed
- a) No deviation
  - b) Positive deviation
  - c) **Negative deviation**
  - d) None of the above
- 15) Solvent extraction method Apparatus used is called as-----
- a) Distillation unit
  - b) Partition funnel
  - c) **Separating funnel**
  - d) Filter paper
- 16) According to the items law of pressure , Partial pressure = Mole fraction x-----
- a) **Total pressure**
  - b) Partial pressure
  - c) Vapour Pressure
  - d) Atmospheric pressure

17) Number of moles of 40 gram of liquid a if its molecular weight is 56gmmol-1 -----

- a) 0.0714 Mole
- b) 0.7 14 Mole**
- c) 0.7014 Mole
- d) 0.7014 Normal

18) The composition of ethyl amine at lower critical solution temperature is----- percent by weights

- a) **50**
- b) 55
- c) 60
- d) 70

19) Water nicotine system system has upper CST temperature -----

- a) **208 degrees**
- b) 209 degrees
- c) 210 degrees
- d) 211 degrees

20) At certain temperature two layers of miscible liquids become completely miscible this temperature is known as -----

- a) **Critical solution temperature**
- b) Critical solution Pressure
- c) Conjugate solution temperature
- d) Conjugate solution temperature

## **INORGANIC CHEMISTRY ( Unit II)**

**Chapter: 2.1 Chemistry of Boron Compounds**

**2.2 Chemistry of silicon and Germanium**

**2.3 Chemistry of Nitrogen family**

21) \_\_\_\_\_ is the 13th group element .

- a) Carbon
- b) Nitrogen
- c) Oxygen
- d) Gallium

22) Aluminium is extremely stable in its \_\_\_\_\_ oxidation state .

- a) +1
- b) +2
- c) +3
- d) +4

23) Amongst the following \_\_\_\_\_ is the most acidic halide of boron .

- a)  $\text{BF}_3$
- b)  $\text{BI}_3$
- c)  $\text{BBr}_3$
- d)  $\text{BCl}_3$

- 24)  $B_nH_{n+4}$  called as \_\_\_\_\_ .  
a) Closo Borane  
b) Nido Borane  
c) Archborane  
d) None of these
- 25) An aqueous solution of borax is \_\_\_\_\_ .  
a) acidic  
b) basic  
c) phenolic  
d) neutral
- 26) In a  $B_2H_6$  molecule, there are total \_\_\_\_\_ hydrogen atoms at terminal position .  
a) 2  
b) 3  
c) 4  
d) 5
- 27) In 14<sup>th</sup> group elements, with increase in atomic number , atomic radii \_\_\_\_\_ .  
a) Marginally decreases  
b) Sharply increases  
c) Marginally increases  
d) Sharply decreases
- 28) Lead is \_\_\_\_\_ .  
a) metal  
b) non-metal  
c) metalloid  
d) none of these
- 29)  $SiCl_4$  has \_\_\_\_\_ structure .  
a) Linear  
b) Trigonal planar  
c) tetrahedral  
d) octahedral
- 30) In  $SiO_2$ , silicon undergoes \_\_\_\_\_ Hybridization .  
a) sp  
b) sp<sup>2</sup>  
c) sp<sup>3</sup>  
d) sp<sup>4</sup>
- 31) Arsenic is \_\_\_\_\_ group element .  
a) 13<sup>th</sup>  
b) 14<sup>th</sup>  
c) 15<sup>th</sup>  
d) 16<sup>th</sup>
- 32) \_\_\_\_\_ is the 15th group element .  
a) Germanium  
b) Nitrogen  
c) Aluminium  
d) carbon
- 33) The general valence shell electronic configuration of Nitrogen family elements is \_\_\_\_  
a)  $ns^2, np^1$   
b)  $ns^2, np^2$   
c)  $ns^2, np^3$   
d)  $ns^2, np^4$

- 34) The valence shell electronic configuration of Phosphorus is \_\_\_\_\_
- $2s^2, 2p^3$
  - $3s^2, 3p^3$
  - $4s^2, 4p^3$
  - $5s^2, 5p^3$
- 35) \_\_\_\_\_ is an odd electron molecule .
- $N_2O$
  - $N_2O_3$
  - $NO$
  - $N_2O_5$
- 36) Among the following \_\_\_\_\_ cannot form compounds with +5 oxidation state
- Nitrogen
  - Phosphorus
  - Arsenic
  - Antimony
- 37) Hydrides of Nitrogen forms \_\_\_\_\_ structure
- Pyramidal
  - bent
  - linear
  - trigonal bipyramidal
- 38) Among the following \_\_\_\_\_ is non-metal
- Bismuth
  - Arsenic
  - Antimony
  - Phosphorus
- 39) \_\_\_\_\_ is a very bad conductor of heat and electricity.
- Antimony
  - Bismuth
  - Phosphorus
  - Tin
- 40) The correct order of heat of formation of hydrides of Nitrogen family \_\_\_\_\_ .
- $NH_3 > PH_3 > AsH_3 > SbH_3$
  - $NH_3 > PH_3 > SbH_3 > AsH_3$
  - $NH_3 < PH_3 < AsH_3 < SbH_3$
  - $NH_3 < SbH_3 < PH_3 < AsH_3$

### Organic chemistry

41. .... are organic compounds which contain  $>C=O$  group as functional group
- Alkanes
  - Alcoholic
  - Carbonyl**
  - Hydroxyl
42. In case of aromatic aldehydes, the name.... is accepted in IUPAC.
- Benzaldehyde**
  - Acetaldehyde
  - Phenylaldehyde
  - Benzene aldehyde

43. Which of following is aliphatic ketones
- Acetophenone
  - Benzophenone
  - P-Benzoquinone
  - Cyclopentanone**
- 44 Hydration of alkynes to form aldehydes and ketones takes place in presence of...
- $\text{H}_2\text{O}_2/\text{NaOH}$
  - $\text{H}_2\text{O}/\text{H}_2\text{SO}_4$**
  - Dry ether
  - $\text{H}_2\text{O}/\text{Mix of H}_2\text{SO}_4\ \&\ \text{HgSO}_4$
- 45..... reduction is a selective reduction of acid halide into aldehydes & ketone
- Grignard reagent
  - Gattermann Koch Formylation
  - Rosenmund**
  - Friedel Crafts reaction
46. ....is treated with Na-ethoxide to get its Na-salt.
- Acetone
  - Acetyl acetone**
  - Propyl acetone
  - Propanone
47. Enols of  $\beta$ -diketones are stabilized by
- Solvation
  - Vander waals forces
  - Intramolecular H- bond**
  - Intermolecular H-bond
48. How many molecules of aldehyde or ketone are simultaneously reduce by one molecule of  $\text{NaBH}_4$
- 2 Molecules
  - 3 Molecules
  - 4 Molecules**
  - 1 Molecule
49. Aldehyde & ketone reacts with a Primary amine to give an
- Imine**
  - Iminium salt
  - Enamine**
  - Quaternary ammonium salt
50.  $\text{NaBH}_4$  reduces
- Only  $\text{C}=\text{O}$**
  - Only  $\text{C}=\text{C}$
  - Only  $-\text{CN}$
  - Only  $-\text{NO}_2$