

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

PHYSICAL CHEMISTRY

Chapters – 1.1 Solid state 1.2 Catalysis

- 1) In Bragg's equation, the term d is called as-----
 - a) **Inter planar distance**
 - b) Density
 - c) Order of reflection
 - d) Angle of reflection
 - 2) Substances which retard the rate of reaction without themselves undergoing any chemical change are called as-----
 - a) **Negative Catalyst**
 - b) Promoter
 - c) Catalyst
 - d) Positive catalyst
 - 3) Brønsted defined acid as proton _____
 - a) **Donor**
 - b) Acceptor
 - c) Inhibitor
 - d) None of the above
 - 4) Substances which alter the rate of reaction without themselves undergoing any chemical change are called as-----
 - a) **Catalyst**
 - b) Promoter
 - c) Inhibitor
 - d) None of the above
 - 5)-----is that each point represents an atom or an ion has same surrounding as any other the present in the same atom or ion
 - a) **Space lattice**
 - b) Crystal Lattice
 - c) Lattice plane
 - d) None of the above
 - 6) ----- is example of inhibitor in oxidation of aldehyde -----
 - a) Anthracene & Triethyl amine
 - b) **Anthracene & Diphenyl amine**
 - c) Anthracene & naphthalene
 - d) Anthracene & Benzene
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- 7) ----- (1913) studied the kinetics of enzyme catalysis.
- Michaelis and Menton
 - Arrheniuos
 - Bronsted**
 - Lewis
- 8) ----- is example of promoter in activity of iron catalyst
- Al₂O₃**
 - ZnO
 - MgO
 - Pt
- 9) The ratio of spacing d for Face centered cubic lattice is- $d_{100}; d_{110}; d_{111} =$ _____
- 1; 0.707; 1.154**
 - 1; 0.707; 0.577
 - 1; 1.414; 0.577
 - 1; 1.414; 1.900
- 10) Laws of symmetry has three laws 1) ----- 2) axis of symmetry centre of symmetry
- Plane of symmetry**
 - Angle of symmetry
 - Edge of symmetry
 - Axes of symmetry
- 11) Internal structure of sodium chloride crystal is the ----- lattice.
- Face centred cubic**
 - Body centred cubic
 - Face centred cubic
 - None of above
- 12) Law of rational indices was proposed by----- (1974) .
- Hauy**
 - Laue
 - W.H.Bragg
 - Max Plank
- 13) The first order reflection of a beam of X ray from a given Crystal occurs at 5.15° . At what angle will be the third order reflection. -----
- 15.93°**
 - 8.4°
 - 5.2°
 - 10.5°
- 14) Intercepts of faces of cubic crystal on x, y and z axis are 2 a, 3b and 4c The Miller index of the plane is _____
- 6 4,3,**
 - 3,6 4,
 - 6 4,0
 - 0, 4,3
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15) In Base catalysed reaction a proton is first transferred from the Substrate S to the -----

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- a) **Base B**
 - b) Acid A
 - c) Salt S
 - d) None of the above
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INORGANIC CHEMISTRY (Unit II)

Chapter: Ions in aqueous medium

2.1 Acidity of cations and Basicity of anions

2.2 Uses & Environmental chemistry of volatile oxides and oxo-acids

- 16) Among the following _____ is an example of strongly acidic cation
- a) Li^{2+}
 - b) Mg^{2+}
 - c) Al^{3+}
 - d) Cr^{2+}
- 17) The acid producing reaction of cation in aqueous medium is called _____
- a) hydration of cation
 - b) hydrolysis of cation
 - c) solvation of cation
 - d) hydrolysis of anion
- 18) Higher the hydration energy of _____ higher is its acidity
- a) Cation
 - b) Anion
 - c) oxo anion
 - d) both cations & anions
- 19) Hydrolysis of hydrated cation make the solution _____
- a) Acidic
 - b) Neutral
 - c) Basic
 - d) Phenolic
- 20) _____ the value of pKa, _____ the degree of hydrolysis of cation
- a) Lower, higher
 - b) Higher, higher
 - c) Lower, lower
 - d) Lower, does not affect
- 21) pKa range for moderately acidic cation is between _____
- a) 1 to 6
 - b) 6 to 11.5
 - c) -4 to 1
 - d) 11.5 to 14
- 22) Non-acidic cation having pKa value _____
- a) greater than 14
 - b) between 6 to 11.5
 - c) between -4 to 1
 - d) between 1 to 6

- 23) Cations are weakly acidic if Z^2/r ratio is _____
- less than 0.01
 - between 0.01-0.04
 - between 0.10-0.16
 - between 0.04-0.1
- 24) Hydrolysis of hydrated anion make the solution _____
- acidic
 - basic
 - phenolic
 - neutral
- 25) pK_b range for weakly basic anion is between _____
- 1 to 6
 - 6 to 11.5
 - 4 to 1
 - 11.5 to 14
- 26) Anions are strongly basic if Z^2/r ratio is _____
- less than 0.01
 - between 0.16-0.22
 - between 0.04-0.10
 - between 0.10-0.16
- 27) With _____ in charge to radius ratio of cation, hydration energy _____
- increase, increases
 - increase, decreases
 - decrease, increases
 - decrease, not affected
- 28) With increase in hydration energy of anion, _____ of its aqueous solution increases.
- Acidity
 - basicity
 - neutrality
 - phenolic nature
- 29) Ba^{2+} is an example of _____ cations
- Non-acidic
 - Feebly acidic
 - Strongly acidic
 - Weakly acidic
- 30) Moist NO_2 gas is _____
- strongly acidic
 - strongly phenolic
 - strongly basic
 - Neutral
- 31) Thermal power stations are main sources of _____
- SO_2
 - N_2O
 - P_4O_6
 - P_2O_5
- 32) _____ is mainly used as dehydrating agent
- P_2O_5
 - P_4O_6
 - P_2O_3
 - P_4O_8

- 33) The order of pK_b values of oxoanions of halogen is _____
- $\text{ClO}^- > \text{BrO}^- > \text{IO}^-$
 - $\text{ClO}^- < \text{BrO}^- < \text{IO}^-$
 - $\text{BrO}^- > \text{IO}^- > \text{ClO}^-$
 - $\text{BrO}^- < \text{IO}^- < \text{ClO}^-$
- 34) _____ is also called laughing gas.
- N_2O
 - NO_2
 - CO_2
 - NO
- 35) Sulphuric acid is used in _____ .
- Only pickling
 - Only car batteries
 - Both pickling and car batteries
 - Neither pickling nor car batteries

Organic chemistry Amines & Heterocyclic compounds

36. Which of the following is less basic than aniline?
- Diphenylamine
 - Triphenyl amine**
 - P-Nitroaniline
 - Benzylamine
37. Preparation of Dyes from with Naphthol's called coupling reaction
- benzene
 - Aniline
 - benzene diazonium salt**
38. The Weakest base among the following is
- Pyridine
 - Pyrrole**
 - Aniline
 - Piperidine
39. Melting points are normally the lowest for
- Tertiary amides**
 - Secondary amides
 - Aniline
 - Primary amides
40. In the presence of an acid, hydrolysis of methyl cyanide produces
- Methyl alcohol
 - Acetic acid
 - Aniline
 - Primary amides**
41. Aniline reacts with bromine in acetic acid to give..... aniline
- o-bromo aniline
 - Mix of o-bromo aniline & p- bromo aniline**
 - 2,4-dibromo aniline
 - 2,4,6-tribromo aniline

- 42 . In Hofmann Rearrangement In number of carbon atoms.
- Increase by 2
 - Decrease by 2
 - Decrease by 1**
 - Increase by 1
42. Reaction of with nitrous acid and HCl is called diazotisation.
- aniline**
 - Benzene
 - Acetanilide
 - Ethyl amine
43. Which of the following compounds aromatic.
- THF
 - Piperidine
 - Cyclohexyl amine
 - Pyrrole**
44. Nitrogen atom in pyridine is.....
- SP² hybridized**
 - SP³ hybridized
 - SP hybridized
 - Not hybridized
45. In Chichibabin reaction pyridine is treated with in liquid ammonia .
- Amide
 - Sodamide**
 - LiAlH₄
 - NaBH₄
46. In Vilsmeier Haack reaction heterocyclic compound is treated with..... and POCl₃
- (CH₃CO)₂O
 - DMF**
 - SO₂Cl₂
 - Pyridine-SO₃
47. Reduction of Methyl cyanide by LiAlH₄ to give
- Ethyl amine**
 - Diphenyl Methane
 - Diphenyl amine
 - Benzyl amine
- 48 Conversion of Phthalimide into anthranilic acid takes place by.....reaction
- Hofmann reaction**
 - Sulphonation
 - Azo coupling
 - Nitration
- 49 Which of the following amine does not undergo acetylation?
- t- Butylamine**
 - Aniline
 - p- nitro Aniline
 - p amino phenol
- 50 Which of the following amine does not gives carbylamines test?
- n-Butylamine
 - Ethylamine
 - Propanamine
 - N- Methylaniline**