



PREBOARD EXAMINATION (2021-22)

TERM I- SET A

Subject: CHEMISTRY

Max. Marks: 35

Grade: XII

Time: 90 minutes

General Instructions:

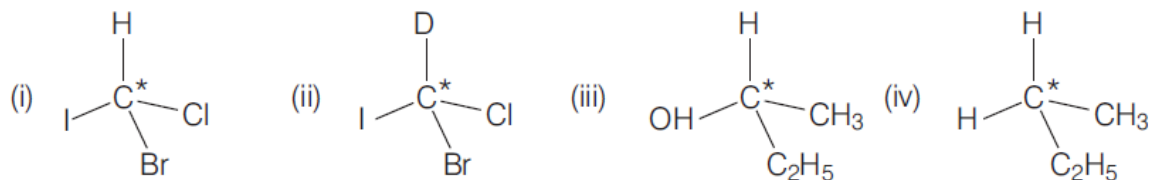
- The Question Paper contains three sections.
- Section A has 25 questions. Attempt any 20 questions.
- Section B has 24 questions. Attempt any 20 questions.
- Section C has 6 questions. Attempt any 5 questions.
- All questions carry equal marks.
- There is no negative marking

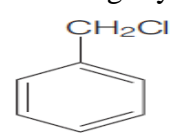
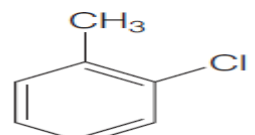
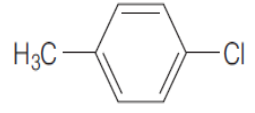
SECTION A

This section consists of 25 multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

1. The appearance of colour in solid alkali metal halides is generally due to
 - a. Schottky defect
 - b. Frenkel defect
 - c. Interstitial defect
 - d. F-centres
2. Which of the following is true about the value of refractive index about quartz glass?
 - a. Same in all directions
 - b. Different in different directions
 - c. Cannot be measured
 - d. Always Zero
3. Sodium crystallizes in a body-centered cubic lattice with a unit cell edge of 4.29 \AA . The radius of the sodium metal is approximately
 - a. 5.72 \AA
 - b. 0.93 \AA
 - c. 1.86 \AA
 - d. 3.22 \AA
4. For an aqueous solution, freezing point is -0.186°C . Elevation of boiling point for the same solution is ($K_f = 1.86^\circ\text{C mol}^{-1}\text{kg}$ and $K_b = 0.512^\circ\text{C mol}^{-1}\text{kg}$)
 - a. 0.186°C
 - b. 0.0512°C
 - c. 1.86°C
 - d. 5.12°C
5. The mole-fraction of solute in an aqueous solution of substances having strength 4.5m ?
 - a. 0.75
 - b. 0.075
 - c. 0.45
 - d. 0.045
6. The system that forms maximum boiling azeotrope is
 - a. Acetone-chloroform
 - b. ethanol-acetone
 - c. n-hexane-n-heptane
 - d. carbon disulphide-acetone
7. An aqueous solution of methanol in water has vapour pressure
 - a. Equal to that of water
 - b. Equal to that of methanol
 - c. More than that of water
 - d. Less than that of water

8. In which of the following molecules carbon atom marked with asterisk (*) is asymmetric?



- a. (i), (ii), (iii) and (iv)
b. (i), (ii) and (iii)
c. (ii), (iii) and (iv)
d. (i), (iii) and (iv)
9. Which of the following undergoes nucleophilic substitution exclusively by S_N1 mechanism?
- a. Benzyl Chloride
b. Ethyl Chloride
c. Chlorobenzene
d. Isopropyl Chloride
10. The reaction of toluene with chlorine in the presence of iron and in the absence of light yields
- a. 
b. 
c. 
d. Mixture of (b) and (c)
11. Which of the following is most acidic?
- a. Benzyl alcohol
b. Cyclohexanol
c. Phenol
d. *m*-chlorophenol
12. The heating of phenyl methyl ether with HI produces
- a. Iodobenzene
b. Phenol
c. Benzene
d. Ethyl chloride
13. Phenol reacts with CO_2 at 3-7 atm, on heating in presence of NaOH followed by acidification to form
- a. Salicylic acid
b. Aspirin
c. Benzoic acid
d. Methyl benzoate
14. Which of the following reagents cannot be used to distinguish phenol and ethanol?
- a. FeCl_3
b. NaOH
c. Na
d. $\text{Br}_2/\text{H}_2\text{O}$
15. Aspirin is an acetylation product of
- a. *p*-Dihydroxybenzene
b. *o*-Hydroxybenzoic acid
c. *o*-Dihydroxybenzoic acid
d. *m*-Hydroxybenzoic acid
16. Which of the following statements is wrong?
- a. Single N- N bond is stronger than the single P- P bond.
b. PH_3 can act as a ligand in the formation of coordination compound with transition elements
c. NO_2 is paramagnetic in nature
d. Covalency of nitrogen in N_2O_5 is four.
17. Partial hydrolysis of XeF_6 gives
- a. XeO_3
b. XeF_4
c. XeO_2F_2
d. XeF_2

18. In which of the following pairs, the two species are isostructural?
- SF_4 and XeF_4
 - BrF_3 and NF_3
 - BrO_3^- and XeO_3
 - SO_3^{2-} and NO_3^-
19. The correct order of electron affinity is
- $\text{F} < \text{Cl} < \text{Br}$
 - $\text{F} > \text{Cl} > \text{Br}$
 - $\text{F} > \text{Cl} < \text{Br}$
 - $\text{F} < \text{Cl} > \text{Br}$
20. Sulphur dioxide act as
- Reducing agent
 - Bleaching agent
 - Both (a) and (b)
 - None of these
21. Which one of the following has O-O bond?
- Sulphurous acid
 - Sulphuric acid
 - Peroxodisulphuric acid
 - Pyrosulphuric acid
22. The noble gas having the lowest boiling point
- Helium
 - Neon
 - Argon
 - Krypton
23. Which of the following does not confirm the presence of carbonyl group in glucose?
- Reaction with hydroxyl amine
 - Reaction with hydrogen cyanide
 - Reaction with acetic anhydride
 - Reaction with bromine water
24. The main forces which stabilize the 2^0 and 3^0 structures of proteins is/are
- hydrogen bond
 - disulphide linkages
 - Vander Waals
 - All of these
25. The anomeric carbon in D (+) glucose is
- C-1 carbon
 - C-2 carbon
 - C-5 carbon
 - C-6 carbon

SECTION B

This section consists of 24 multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

26. A compound is formed by cation C and anion A. The anions form hexagonal closed packed lattice and cation occupy 75% of octahedral voids. The formula of the compound is
- C_2A_3
 - C_3A_2
 - C_3A_4
 - C_4A_3
27. Metal M ions form a ccp structure. Oxide ions occupy $\frac{1}{2}$ octahedral and $\frac{1}{2}$ tetrahedral voids. What is the formula of the oxide?
- MO
 - MO_2
 - MO_3
 - M_2O_3
28. The concentration of cane-sugar solution which is isotonic with 0.86% solution of urea (mol.wt.=60g/mol) is
- 4.9%
 - 3%
 - 5.8%
 - 8.4%
29. Which of the following reaction is most suitable for the preparation of n-propyl benzene?
- Sandmeyer's reaction
 - Wurtz reaction
 - Wurtz-Fittig reaction
 - Swartz reaction

30. Which is the correct increasing order of boiling points of the following compounds?
1-bromoethane, 1-bromopropane, 1-bromobutane, Bromobenzene
- Bromobenzene < 1-bromobutane < 1-bromopropane < 1-bromoethane
 - Bromobenzene < 1-bromoethane < 1-bromopropane < 1-bromobutane
 - 1-bromopropane < 1-bromobutane < 1-bromoethane < Bromobenzene
 - 1-bromoethane < 1-bromopropane < 1-bromobutane < Bromobenzene
31. The reagent to distinguish between propan-2-ol and 2-Methylpropan-2-ol
- SOCl_2
 - Alkaline KMnO_4
 - ZnCl_2 and conc. HCl
 - PCC
32. The order of reactivity of the following alkyl halides for a $\text{S}_\text{N}2$ reaction is
- $\text{RF} > \text{RCl} > \text{RBr} > \text{RI}$
 - $\text{RF} > \text{RBr} > \text{RCl} > \text{RI}$
 - $\text{RCl} > \text{RBr} > \text{RF} > \text{RI}$
 - $\text{RI} > \text{RBr} > \text{RCl} > \text{RF}$
33. The correct IUPAC name of the compound $(\text{C}_2\text{H}_5)_3\text{CBr}$ is.....
- 3-Bromo-3-ethylpentane
 - 1-Bromo-3,3-diethylpropane
 - 1-Bromo-1,1,1-triethylmethane
 - 1-Bromo-1,1-diethylpropane
34. Among the following set of reactants which one produces anisole?
- CH_3CHO ; RMgX
 - $\text{C}_6\text{H}_5\text{OH}$; NaOH ; CH_3Br
 - $\text{C}_6\text{H}_5\text{OH}$; neutral FeCl_3
 - $\text{C}_6\text{H}_5\text{-CH}_3$; CH_3COCl ; AlCl_3
35. Which one of the following compounds has highest boiling point?
- Propan-1-ol
 - n-butane
 - Chloroethane
 - Propanal
36. Which one of the following can be oxidised to the corresponding carbonyl compound?
- Phenol
 - 2-methyl-2-hydroxypropane
 - 2-hydroxypropane
 - Anisole
37. In 1962, Neil Bartlett prepared a red coloured compound which is formulated as
- $\text{O}_2^+\text{PtF}_4^-$
 - $\text{O}_2^+\text{PtF}_6^-$
 - $\text{O}_2^+\text{PtF}_5^-$
 - PtF_4^-
38. Nitrogen is a relatively inactive element because
- Its atom has a stable electronic configuration
 - It has low atomic mass
 - Its electronegativity is fairly high
 - Dissociation energy of its molecule is fairly high
39. On heating ammonium dichromate and barium azide separately, we get
- N_2 in both cases
 - N_2 with ammonium dichromate and NO with barium azide
 - NO_2 with ammonium dichromate and N_2 with barium azide
 - NO_2 with ammonium dichromate and NO_2 with barium azide
40. Concentrated HNO_3 reacts with I_2 to give
- HI
 - HOI
 - HIO_3
 - HOIO_3
41. Bleaching powder is formed by the interaction of Cl_2 and
- a dilute solution of Ca(OH)_2
 - A concentrated solution of Ca(OH)_2
 - dry calcium oxide
 - dry slaked lime

42. The correct increasing order of ionic radii is
- $\text{Po} < \text{Se} < \text{Te} < \text{S} < \text{O}$
 - $\text{O} < \text{S} < \text{Se} < \text{Te} < \text{Po}$
 - $\text{S} < \text{O} < \text{Te} < \text{Se} < \text{Po}$
 - None of these
43. Which one is the complimentary base of cytosine in one strand to that in the other strand of DNA?
- Adenine
 - Guanine
 - Thymine
 - Uracil
44. Dinucleotide is obtained by joining two nucleotides together by phosphodiester linkage. Between which carbon atoms of pentose sugars of nucleotides are these linkages present?
- 5' and 3'
 - 1' and 5'
 - 5' and 5'
 - 3' and 3'
- Given below are two statements labelled as Assertion (A) and Reason (R)
Select the most appropriate answer from the options given below:
45. Assertion : (A) Larger the value of cryoscopic constant, lesser will be the freezing point of the solution.
Reason: (R) Depression in freezing point depends on the nature of the solvent.
- Both A and R are true and R is the correct explanation of A
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.
46. Assertion : (A) KCN reacts with methyl chloride to give methyl isocyanide.
Reason: (R) CN^- is an ambident nucleophile.
- Both A and R are true and R is the correct explanation of A
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.
47. Assertion (A): Like bromination of benzene, bromination of phenol is also carried out in the presence of Lewis acid.
Reason (R): Lewis acid polarizes bromine molecule.
- Both A and R are true and R is the correct explanation of A
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.
48. Assertion: F_2 has lower bond dissociation enthalpy than Cl_2 .
Reason: Fluorine is more electronegative than chlorine.
- Both A and R are true and R is the correct explanation of A
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.
49. Assertion: Bond angle of H_2S is smaller than H_2O .
Reason: Electronegativity of the central atom increases, bond angle decreases.
- Both A and R are true and R is the correct explanation of A
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.

SECTION C

This section consists of 6 multiple choice questions with an overall choice to attempt any 5. In case more than desirable number of questions are attempted, ONLY first 5 will be considered for evaluation.

50. Match the items of column I with items of column II.

Column I	Column II
i) Sucrose	A) Tollens test
ii) Keratin	B) Essential Amino acid
iii) Lysine	C) β -D -Ribose
iv) Glucose	D) Insoluble in water
v) RNA	E) Nucleotides
vi) Nucleic acid	F) Disaccharide

a. i)– F, ii)– D, iii)– B, iv)– A, v)– C, vi)– E **b.** i)– E, ii)– D, iii)– B, iv)– A, v)– C, vi)– F

c. i)– F, ii)– D, iii)– C, iv)– A, v)– B, vi)– E **d.** i)– F, ii)– A, iii)– B, iv)– D, v)– C, vi)– E

51. Which of the following analogies is correct

- a.** Fructose: monosaccharide :: Sucrose: disaccharide **b.** Nucleic acid: phosphodiester linkage :: protein :peptide linkage
c. DNA: uracil :: RNA: thymine **d.** Keratin : water soluble::albumin :water soluble

52. A halogen which forms only one oxoacid: A: A halogen which is the strongest oxidizing agent :B

- a.** A: Flourine B: Flourine **b.** A: Flourine B: Iodine
c. A: Iodine B: Flourine **d.** A: Iodine B: Iodine

Case Any departure from a perfectly orderly arrangement of constituent particles is called a defect or imperfection.in solids, when the ratio between a cation and anion remains the same after defect, it is termed as stoichiometric defect. Schottky and Frenkel defect are characterised into stoichiometric defects. In Schottky defect equal number of cations and anions are missing while in Frenkel defect cations are missing from the lattice sites and occupy the interstitial sites. In non-stoichiometric defects, the ratio of cations and anions changes because of the defect. Metal excess and metal deficiency defects are non-stoichiometric defects.

53. Which of the following defects is also known as dislocation defect?

- a.** Frenkel defect **b.** Schottky defect
c. Non-stoichiometric defect **d.** Simple interstitial defect

54. Which of the following compounds does not show metal deficiency defect?

- a.** FeO **b.** CuO
c. NaCl **d.** ZnS

55. Among solids, the highest melting point is exhibited by

- a.** Covalent solids **b.** Ionic solids
c. Pseudo solids **d.** Molecular solids
