INDIAN SCHOOL AL WADI AL KABIR

DEPARTMENT OF SCIENCE

MAX MARKS: 35

CLASS: XII SUBJECT: CHEMISTRY

SAMPLE PAPER - 4

General Instructions

Each question carries 1 mark.
All questions are compulsory.

1. A brown ring is formed in the ring test for NO_3^- ion. It is due to the formation of:

(a) $[Fe(H_2O)_5(NO)]^{2+}$
(b) $[Fe(H_2O)_4(NO)_2]^{+}$
(c) $[Fe(H_2O)_4(NO)_2]^{2+}$
(d) $FeSO_4.HNO_3$

2. The unit of boiling point elevation constant (K_b) is

(a) K mol kg^{-1}
(b) K kg mol^{-1}
(c) kg K^{-1} mol^{-1}
(d) None of these

3. Which one is not a property of ozone?

(a) it acts an oxidising as well as bleaching agent
(b) Ozone reacts with I^- to give I_2
(c) Ozone reacts with PbS to give $PbSO_4$
(d) Since the formation of ozone from oxygen is highly exothermic, it is necessary to use a silent electric discharge

4. Sulphur shows paramagnetic behaviour because:

(a) In vapour state sulphur partly exists as S_8 molecule which has two unpaired electrons in the antibonding π * orbitals
(b) In vapour state sulphur partly exists as S_2 molecule which has two unpaired electrons in the antibonding π * orbitals
(c) In vapour state sulphur partly exists as S_2 molecule which has four unpaired

electrons in the antibonding π * orbitals

(d) In vapour state sulphur partly exists as S_6 molecule which has two unpaired electrons in the antibonding π * orbitals

5. Maximum covalency of nitrogen is

(a) 5

(b) 3

(c) 4

(d) 6

6. A metal crystallises in fcc lattice. If the radius of the metal is 100 pm, what is the length of each side of the unit cell?

(a) 2.828×10^{-10} m

(b) 2.828×10^{-10} cm

(c) 282.8×10^{-10} m

(d) 230.9×10^{-10} m

7. Which of the following statements is wrong?

(a) N–N single bond is stronger than the P–P single bond.

(b) PH_3 can act as a ligand in the formation of coordination compound with transition elements.

(c) O_2 is paramagnetic in nature.

(d) Iodine can form both positive and negative oxidation states.

8. Which of the following does not react with oxygen directly?

(a) Zn (b) Ti

(c) Pt (d) Fe

9. Which one has the lowest boiling point?

(a) NH_3 (b) PH_3

(c) AsH_3 (d) SbH_3

10. When excess ammonia is added to a solution containing Cu^{2+}, the solution turns

(a) pale blue (b) deep blue

(c) pale pink (d) deep pink

11. Which of the following is not correctly matched?

(a) SF_4 – gas (b) SeF_4 – liquid

(c) TeF_4 – solid (d) SF_6 – solid

12. Which of the following is not oxidized by O_3?

(a) KI (b) $FeSO_4$

(c) $KMnO_4$ (d) K_2MnO_4

13. Cl_2 reacts with cold and dilute NaOH to give

(a) NaCl, NaOCl and H_2O

(b) NaCl, $NaClO_2$ and H_2O

(c) NaCl, $NaClO_3$ and H_2O

(d) NaCl, $NaClO_4$ and H_2O

14. At room temperature, HCl is a gas while HF is a liquid. This is because

(a) H- F bond is covalent
(b) H- F bond is ionic
(c) HF has metallic bond
(d) HF has hydrogen bond

15. One molal solution is a solution that contains one mole of a solute in

(a) 1000 g of the solvent

(b) One litre of the solvent

(c) One litre of the solution

(d) (a) 1000 g of the solution

16. The people living longer at high altitudes suffer from the disease known as

(a) High blood pressure

(b) Edema

(c) suffocation

(d) Anoxia

17. Isotonic solutions have same

(a) Density

(b) Mole fraction

(c) Molality

(d) Osmotic pressure

18. Compound A reacts with $SOCl_2$ to give B which on treatment with KCN to give Propanenitrile. Identify A and B.

(a) C_2H_5OH and C_2H_5Cl

(b) CH_3OH and CH_3Cl

(c) C_3H_7OH and C_3H_7Cl

(d) C_2H_5Cl and C_2H_5OH

19. $CH_3Cl + KCN \rightarrow X$

$CH_3Cl + AgCN \rightarrow Y$

Identify X and Y

(a) X = CH_3NC, Y = CH_3CN

(b) X = CH_3CN, Y = CH_3NC

(c) Both X and Y are CH_3CN

(d) Both X and Y are CH_3NC

20. Among the isomeric alkanes of the molecular formula C_5H_{12}, the one which gives three monochloride on photochemical chlorination is

(a) 2-Methylbutane

(b) 2,2-Dimethylpropane

(c) Pentane

(d) None of these

21. Most reactive halide towards S_N1 reaction is

(a) $CH_3CH_2CH=CHCl$

(b) $CH_3CH_2CH_2CH_2Cl$

(c) $CH_3CH=CHCH_2Cl$

(d) $CH_2=CHCH_2CH_2Cl$

22. IUPAC name of $(CH_3)_2CHCH(Cl)CH_3$ is:

(a) 2-Chloro-3-methylbutane

(b) 3-Chloro-2-methylbutane

(c) 3-Chloro-3-ethylbutane

(d) 3-Chloro-3-methylpentane

23. Which reagent is required for the conversion of phenol to picric acid?

(a) Dil.HNO_3

(b) Con.HNO_3

(c) NaOH/HCl

(d) Br_2 water

24. Salicylic acid reacts with ……. to form Aspirin.

(a) Acetyl salicylic acid

(b) Acetophenone

(c) Acetic anhydride

(d) Benzylchloride

25. Phenol is less acidic than …….

(a) Ethanol

(b) 4-Nitrophenol

(c) 4-Methylphenol

(d) 4-Methoxyphenol

26. Dehydration of alcohol to ethers is catalysed by

(a) Hot HNO_3

(b) Hot NaOH

(c) Con.H_2SO_4 at 443K

(d) Con.H_2SO_4 at 413K

27. What happens when tertiary butyl alcohol is passed over heated copper at 573 K?

(a) Secondary butyl alcohol is formed

(b) 2-Methylpropene is formed

(c) But-1-ene is formed

(d) Butan-1-ol is formed

28. Complete the following analogy:

Phenol + Br_2 in CS_2 : A :: phenol + Br_2 water : B

(a) A : o-bromophenol B : p-bromophenol

(b) A : p-bromophenol B : 2,4,6-tribromophenol

(c) A : 2,4,6-tribromophenol B : p-bromophenol

(d) A : m-bromophenol B : p-bromophenol

29. …….. of proteins represents overall folding of the polypeptide chains.

(a) Primary structure

(b) Secondary structure

(c) Quaternary structure

(d) Tertiary structure

30. Identify the correct statement from the following.

(a) During denaturation 2° and 3° structures are destroyed but 1º structure remains intact.

(b) During denaturation 1° and 3° structures are destroyed but 2º structure remains intact.

(c) During denaturation 1° and 2° structures are destroyed but 3º structure remains intact.

(d) During denaturation 1° and 3° structures are destroyed but 4º structure remains intact.

31. On oxidation with nitric acid, glucose as well as gluconic acid both yield a dicarboxylic acid, saccharic acid. This indicates the presence of ……

(a) a carbonyl group

(b) an aldehydic group

(c) five –OH groups

(d) a primary alcoholic group

32. Match the following

I	II
i) Zaitsev rule	A) CH_3-CH_2-CH_2-Cl
ii) Markonikov's rule	B) CH_2=CH-CH_2-Cl
iii) Vinyl halide	C) Addition of HBr to propene
iv) Allyl halide	D) Dehydrohalogenation of alkyl halides
	E) CH_2=CH-Cl

Which of the following is the best matched options?

(a) i-C, ii-A, iii-D, iv-E

(b) i-D, ii-B, iii-C, iv-E

(c) i-B, ii-D, iii-E, iv-A

(d) i-D, ii-C, iii-E, iv-B

Read the passage given below and answer the following questions:

Alcohols are a group of compounds containing one, two or more hydroxyl (-OH) groups that are attached to the alkane of a single bond. These compounds have a general formula -of OH. They have primary importance in the field of organic chemistry as they can be changed or converted to different types and types of compounds such as Aldehydes and Ketones, etc. The reactions with alcohol are two different categories. These Reactions can leave the R-O bond or even they can leave O-H bond. The process through which alcohols are converted to either Aldehydes or Ketones, is called oxidation. Oxidizing alcohols to Aldehydes and Ketones is important in modern-day synthetic chemistry. These reactions are prompted through the presence of best oxidants/catalysts with compounds like Ruthenium. Before proceeding with the oxidation, it is important to have a full understanding of all the mechanisms and inclusive factors.

33. Which one of the following reagents cannot be used to oxidise primary alcohols to aldehydes?

(a) CrO_3 in acidic medium

(b) $KMnO_4$ in acidic medium

(c) Pyridinium chlorochromate

(d) Heat in the presence of Cu at 573K

34. **Assertion:** Tertiary alcohols do not undergo oxidation reactions.

Reason: Under strong reaction conditions tertiary alcohols oxidise to give aldehydes.

(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) Assertion is true but Reason is false.

(d) Assertion is false but Reason is true.

35. **Assertion:** Boiling points of alcohols increase with increase in the number of carbon atoms

Reason: Alcohols form intermolecular hydrogen bonds.

(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) Assertion is true but Reason is false.

(d) Assertion is false but Reason is true.

ANSWERS

1.	(a) $[Fe(H_2O)_5(NO)]^{2+}$
2.	(b) K kg mol^{-1}
3.	(d) Since the formation of ozone from oxygen is highly exothermic, it is necessary to use a silent electric discharge
4.	(b) In vapour state sulphur partly exists as S_2 molecule which has two unpaired electrons in the antibonding π^* orbitals
5.	(c) 4
6.	(a) 2.828 x 10^{-10} m
7.	(a) N–N single bond is stronger than the P–P single bond
8.	(c) Pt
9.	(b) PH_3
10.	(b) deep blue
11.	(d) SF_6 – solid
12.	(c) $KMnO_4$
13.	(a) NaCl + NaOCl + H_2O
14.	(d) HF has hydrogen bond
15.	(a) 1000 g of the solvent
16.	(d) Anoxia
17.	(d) Osmotic pressure
18.	(a) C_2H_5OH and C_2H_5Cl
19.	(b) X = CH_3CN, Y = CH_3NC
20.	(c) Pentane
21.	(c) $CH_3CH=CHCH_2Cl$
22.	(a) 2-Chloro-3-methylbutane
23.	(b) Con.HNO_3
24.	(c) Acetic anhydride
25.	(b) 4-Nitrophenol
26.	(d) Con.H_2SO_4 at 413K
27.	(b) 2-Methylpropene is formed

28.	(b) A : p-bromophenol B : 2,4,6-tribromophenol
29.	(d) Tertiary structure
30.	(a) During denaturation 2° and 3° structures are destroyed but 1º structure remains intact.
31.	(d) a primary alcoholic group
32.	(d) i-D, ii-C, iii-E, iv-B
33.	(b) $KMnO_4$ in acidic medium
34.	(c) Assertion is true but Reason is false.
35.	(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.