

Mock Test – 3 (CBSE)

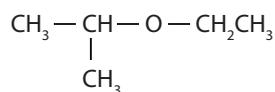
Time: 3 Hrs

Max. Marks: 70

General Instructions

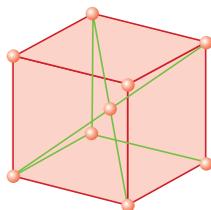
1. All questions are compulsory.
2. Question numbers 1 to 8 are very short answer questions and carry 1 mark each.
3. Question numbers 9 to 18 are short answer questions and carry 2 marks each.
4. Question numbers 19 to 27 are also short answer questions and carry 3 marks each.
5. Question numbers 28 to 30 are long answer questions and carry 5 marks each.
6. Use log tables if necessary, use of calculators is not allowed.

1. Give IUPAC names of the following:

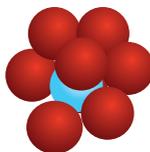


(1)

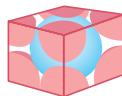
2. What are stoichiometric defects or intrinsic defects in ionic crystals? (1)
3. Write Arrhenius equation for the dependence of rate on temperature. (1)
4. What is mutarotation? (1)
5. Which point defect lowers the density of a crystal? (1)
6. Define collision frequency factor. (1)
7. Where is liquid nitrogen used? (1)
8. How will you obtain 1-bromopropane from propene? (1)
9. Name the reagents and write the chemical equations for the preparation of the following compounds by Williamson synthesis.
(a) Ethoxybenzene
(b) 2-Methyl-2-methoxypropane (2)
10. Look at the following figures:
(a) What do the Figs. (a)–(c) represent?



(a)

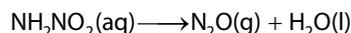


(b)



(c)

- (b) What is the total number of atoms per unit cell in the above structure? (2)
 11. A 100 W, 220 V incandescent lamp is connected in series with an electrolytic cell containing copper sulphate solution. What weight of copper will be deposited by a current flowing for 5 h? (At. wt. of Cu = 63.54 u). (2)
 12. Under what conditions do ethers form oxonium salts? How is the presence of peroxides in ethers detected and removed?
- OR**
- Explain why cleavage of alkyl phenyl ethers with HBr always produces phenol and alkyl bromides, and not bromobenzene and alkanols. (2)
13. Write balanced equations for the following reactions:
(a) $\text{Cu} + \text{conc. H}_2\text{SO}_4 \rightarrow$
(b) $\text{SF}_4 + \text{H}_2\text{O} \rightarrow$
(c) $\text{H}_2\text{S} + \text{SO}_2 \xrightarrow{\text{Catalyst}}$
(d) $\text{Te(s)} + \text{Cl}_2(\text{g}) \rightarrow$ (2)
 14. Illustrate the following with an example of reaction:
(a) Ambident nucleophile
(b) Hinsberg test (2)
 15. Write short notes on
(a) Activity and selectivity of catalysts
(b) Shape-selective catalysis (2)
 16. Give reasons:
(a) Methylamine in water reacts with ferric chloride to precipitate ferric hydroxide.
(b) Aromatic amines are less basic than aliphatic amines. (2)
 17. How is it that hydrogen halides in solution act as acids? Why is it that HF is a weak acid while the other halogen acids are strong? (2)
 18. Discuss the effect of pressure, temperature and mechanical rubbing on the adsorption of gases on solids. (2)
 19. Describe zone refining method for getting extra pure sample of a metal. (3)
 20. A conductivity cell when filled with 0.01 M KCl has a resistance of 747.5 ohm at 25°C. When the same cell was filled with an aqueous solution of 0.05 M CaCl_2 solution the resistance was 876 ohm. Calculate
(a) Conductivity of solution
(b) Molar conductivity of solution.
[Conductivity of 0.01 M KCl = 0.14114 S m^{-1}] (3)
 21. The half-life time of a first-order decomposition of nitramide is 2.1 h at 15 °C.

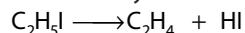


If 6.2 of NH_2NO_2 is allowed to decompose, calculate

- Time taken for NH_2NO_2 to decompose 99%
- Volume of dry N_2O produced at this point measured at STP

OR

For the decomposition of ethyl iodide:



The rate constants are $1.60 \times 10^{-5} \text{ s}^{-1}$ and 6.36×10^{-3} at 600 K and 700 K, respectively. Calculate the activation energy for the reaction. (3)

- What are biodegradable and non-biodegradable detergents? What are the consequences of using latter class of detergents? (3)
- Draw the structure of phosphinic acid (H_3PO_2).
 - Write a chemical reaction for its use as reducing agent. (3)
- Define and classify vitamins. Give atleast two examples of each type. (3)
- Explain why
 - Vinyl chloride is unreactive in nucleophilic substitution reactions.
 - Neopentyl bromide undergoes nucleophilic substitution reaction very slowly.
 - 3-Bromocyclohexene is more reactive than 4-bromocyclohexene in hydrolysis with aqueous NaOH. (3)
- Give the preparation and two uses of the following:
 - Bakelite
 - Teflon
 - Nylon-6 (3)
- Explain optical isomerism in coordinate compounds. (3)
- Explain the following :
 - If vapor pressure of liquid A is greater than the vapor of liquid B at 25 °C, then the boiling point of liquid A is lower than the boiling of liquid B.
 - A mixture of chlorobenzene and bromobenzene is nearly an ideal solution but a mixture of chloroform and acetone is not.

- Aquatic species feel more comfortable in the lakes in winter than in summer.

OR

Explain the terms:

- Freezing point of a liquid
 - Depression in freezing point of a solution and
 - Molal depression constant.
 - What are colligative properties?
 - How the molecular mass of non-volatile substance can be determined from lowering of vapor pressure? (5)
- Which is stronger reducing agent Cr^{2+} or Fe^{2+} and why?
 - Explain why Cu^+ ion is not stable in aqueous solution?
 - Explain why Ce^{4+} is a strong oxidizing agent.
 - Describe the oxidizing property of KMnO_4 in neutral or faintly alkaline medium for its reaction with iodide ions and thiosulphate ions.

OR

- Account for the following:
 - Oxidizing power in the series $\text{V}^{2+} < \text{Cr}_2\text{O}_7^{2-} < \text{MnO}_4^-$
 - Actinoid contraction is greater from element to element than lanthanoid contraction.
 - Oxoanions of a metal show higher oxidation state.
 - What is Misch metal? Give its one use. (5)
- How are aldehydes and ketones prepared from:
 - Alcohols
 - Carboxylic acid chlorides
 - Fatty acids
 - Alkenes

OR

Write the chemical equation when acetic acid reacts with

- Br_2 in presence of phosphorus
- Cl_2 in presence of phosphorus
- Methanol in presence of H_2SO_4
- SOCl_2 and LiAlH_4 (5)