MODEL PAPER OF CHEMISTRY FOR CLASS-12

Objective Type

Time Allowed: 20 Min. **1 × 17 = 17**

Note: Four possible answers A, B, C and D to each question are given. For the choice which you think is correct, fill that circle with marker or pen ink in the answer book. Cutting or filling two or more circles will result in zero marks for that question.

(i) Which Group 2 oxide forms the most alkaline solution in water?

(a) Beryllium oxide (b) Magnesium oxide

(c) Calcium oxide (d) Strontium oxide

(ii) In the complex ion, $[Fe(CN)_6]^{4-}$, what is coordination number of central metal ion?

(a) 2 (b) 4 (c) 6 (d) 8

(iii) Which of the following is organic in nature?

(a) CO_2 (b) CS_2 (c) HCN (d) $CHCl_3$

(iv) Bromine reacts more readily with phenol than with benzene. This is because the

(a) Benzene ring in phenol is more susceptible to nucleophilic attack

(b) Benzene ring in phenol is deactivated because the oxygen of the OH group is very electronegative

(c) lone pair of electrons on the oxygen atom in phenol overlap with the delocalized electrons in the benzene ring

(d) lone pair of electrons on the oxygen atom enable phenol to act as an electrophile

(v) Which one of the following is not a nucleophile?

(a) H_2O (b) H_2S (c) BF_3 (d) NH_3

(vi) Dehydration of alcohols is an example of:

(a) Substitution Reaction (b) Addition Reaction

(c) Elimination Reaction (d) Redox Reaction

(vii) Ketones are prepared by the oxidation of

(a) Primary alcohols (b) Secondary alcohols

(c) Tertiary alcohols (d) Phenol

(viii) Which one of the following bases is a strongest one?

(a) Ammonia (b) Ethyl amine

(c) Phenyl amine (d) Diethyl amine

(ix) Which functional group is formed when carboxylic acid reacts with alcohol in the presence of an acid as catalyst?

(a) Alkane (b) Alcohol (c) Aldehdye (d) Ether

(x) Which pair of monomers reacts to form a polyester?

(a) Diamine and dicarboxylic acid (b) Diol and dicarboxylic acid

(c) Ethene and chloroethene (d) Amino-carboxylic acid

(xi) Glucose is a building block for all, except:

(a) Cellulose (b) Glycogen (c) Insulin (d) Starch

(xii) A substance has a very low R_f value. What does this indicate?

(a) It is insoluble in the solvent (b) It is highly soluble in the solvent

(c) It strongly sticks to the paper (d) It has a high density

(xiii) The types of transitions possible in UV-visible region for a compound with molecular formula C_2H_4 are:

(a) $n \rightarrow \pi^*$ (b) $n \rightarrow \sigma^*$ (c) $\sigma \rightarrow *$ (d) $\pi \rightarrow \pi^*$

(xiv) NMR relies on the magnetic properties of nuclei known as:

(a) Chemical shift (b) Nuclear density (c) Nuclear spin (d) Signal intensity

(xv) Which property makes ceramics suitable for furnace bricks?

(a) Conductivity (b) Low density

(c) High melting point (d) Flexibility

(xvi) Which N-P-K nutrient promotes protein synthesis and chlorophyll?

(a) Nitrogen (b) Phosphorus (c) Potassium (d) Sulphur

(xvii) Which condition is a direct result of cadmium (Cd) replacing calcium (Ca) in the skeletal system?

(a) Minamata disease (b) Blue Baby Syndrome

(c) Itai-itai disease (d) Chloracne

Subjective Type (Part I)

Time allowed: 2.40 Hrs. **Max. Marks: 68**

Q. 2: Write short answers to any eight (08) questions: **(2 × 8 = 16)**

i. Give the products of the thermal decomposition of Strontium nitrate. Write the chemical equation.

ii. How do transition metals function as effective catalysis? Give some examples?

iii. Alkanes have no functional group. Justify.

iv. Give the systematic name of the following compounds

(i) $CH_3\text{-}CH_2\text{-}CN$ (ii) $CH_3COCH_2CH_2\text{-}CH_3$ (iii) CH_3CH_2COOH

v. Define electrophile and nucleophile with two examples each.

vi. Explain what is meant by the term delocalized π-electrons.

vii. What is a meta directing group?

viii. What is Zwitter Ion?

ix. Give two preparations of phenylamine.

x. Give two preparations of secondary amines.

xi. Differentiate between synthesis and retrosynthesis.

xii. How is carboxylic acid converted into an amide group?

Q. 3: Write short answers to any eight (08) questions: (2 × 8 = 16)

i. How does chloropropane react with alcoholic KOH?

ii. How do you convert propanal to propan-1-ol?

iii. How is ethanol converted to acetic acid?

iv. Give the reaction of ethanoyl chloride with phenol?

v. How is the tertiary structure of protein formed?

vi. In what ways are fats and oil different?

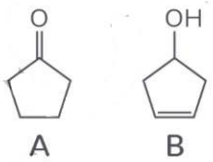
vii. What is Principle of Paper Chromatography?

viii. Why is TLC is not suitable for large-scale separation?

ix. What information does a chromatogram provide?

x. Will $CH_3CHOHCH_3$ show a significant absorption in the UV Visible region? Justify your answer.

xi. What is spectroscopy?



xii. Explain how the two isomers shown in the diagram can be distinguished using IR spectroscopy.

Q. 4: Write short answers to any six (06) questions: (2 × 6 = 16)

i. State two reasons why TMS is a standard in ^1H NMR.

ii. Give two applications of PVC.

iii. Why does deuterium (D) not appear in the NMR spectrum?

iv. State two applications of X-Ray Crystallography in science or industry.

v. Name two specific semiconductors mentioned in the text and their modern applications.

vi. How structure of penicillin allows it to inhibit the transpeptidase enzyme?

vii. What is the concept of pesticide resistance in a target pest population, linking it to the principles of natural selection and repeated application?

viii. Why microplastics are called a growing environmental crisis?

ix. Identify two types of chemical pollutants commonly found in urban storm water run off.

Subjective Type (Part II)

Note: Attempt any three questions. **8 × 3 = 24**

Q.5:

(a) Explain the process of extraction of Mg through Dow's Method. (4)

(b) Describe the S_N1 and S_N2 mechanisms of nucleophilic substitution in halogenoalkanes. (4)

Q.6:

(a) Describe the splitting of d orbitals and color formation in octahedral and tetrahedral complexes. (4)

(b) Illustrate the formation of two condensation polymers. (4)

Q.7:

(a) Explain the atomic orbital model for the structure of benzene. (4)

(b) Explain how X-rays interact with crystals to produce diffraction patterns and how these patterns help to determine atomic positions. (4)

Q.8:

(a) Describe four methods for the preparation of alcohols. (4)

(b) Describe the structure and mechanism of action of penicillin. (4)

Q.9:

(a) Explain the relative acidic strengths of unsubstituted carboxylic acids and substituted carboxylic acids. (4)

(b) Explain the various technologies used in water treatment. (4)

List of Excluded Practicals of Chemistry-11 For Academic Session 2026-2027

- To demonstrate that gases spread by diffusion to areas of lower concentration.
- To separate the given mixture of alcohol and water by distillation.
- To determine the heat of neutralization of NaOH and HCI.

List of Excluded Practicals of Chemistry-12 For Academic Session 2026-2027

- To prepare ethene gas (C_2H_4) in the laboratory by the dehydration of ethanol (C_2H_5OH) using concentrated sulphuric acid (H_2SO_4) as a dehydrating agent.
- To recycle expanded or solid post-consumer polystyrene waste by dissolution in a nontoxic organic solvent (ethyl acetate/acetone) followed by precipitation and recovery as reusable polystyrene resin.
- To determine the Iodine Number (Iodine Value) of a given vegetable oil or fat sample using the iodometric back-titration, and to measure its degree of unsaturation.