

Class 12

Chemistry

Sample paper-2020

SUB: CHEMISTRY

TIME :3 Hr

CLASS- XII

M.M 70

General Instructions

- (a) All questions are compulsory.
- (b) Section A: Q. no. 1 to 20 are very short answer questions and carry 1 mark each.
- (c) Section B: Q. no. 21 to 27 are short answer questions and carry 2 marks each.
- (d) Section C: Q. no. 28 to 34 are long answer questions and carry 3 marks each.
- (e) Section D: Q. no. 35 to 37 are also long answer questions and carry 5 marks each.

Section -A

Multiple choice questions

- Q-1** The function of the salt bridge is to
- (a) allow ions to move from anode to cathode
 - (b) allow solutions from one-half cell to the other half-cell
 - (c) allow the current to flow through the cell and keep the solutions electrically neutral
 - (d) keep the level of solutions same
- Q-2** Which of the following cells can convert chemical energy of H₂ and O₂ directly into electrical energy?
- (a) Mercury cell
 - (b) Daniell cell
 - (c) Lead storage cell
 - (d) Fuel cell
- Q-3** For the redox reaction $\text{Zn} + \text{Cu}^{2+} (0.1 \text{ M}) \rightarrow \text{Zn}^{2+} (1 \text{ M}) + \text{Cu}$ Taking place in a cell $E^{\circ}_{\text{cell}} = 1.10 \text{ v}$. E_{cell} for the galvanic cell will be
- (a) 2.14 v
 - (b) 1.80 v
 - (c) 1.07 v
 - (d) 0.82 v
- Q-4** Molarity of pure water is
- (a) 1
 - (b) 18
 - (c) 55.5
 - (d) 6
- Q-5** The freezing mixture used in ice cream machine consists of ice and
- (a) NaCl
 - (b) CaCl₂
 - (c) KNO₃
 - (d) both a & c
- Q-6** Colligative properties are the properties of solution that depends upon
- (a) nature of molecules
 - (b) quality
 - (c) physical property
 - (d) no. of molecules
- Q-7** The order of reactivities of the following alkyl halides for a S_N2 reaction is

- (a) $RF > RCl > RBr > RI$ (b) $RF > RBr > RCl > RI$
 (c) $RCl > RBr > RF > RI$ (d) $RI > RBr > RCl > RF$.
- Q-8** Which of the following is responsible for depletion of the ozone layer in the upper strata of the atmosphere?
 (a) Ferrocene (b) Fullerenes (c) Freons (d) polyhalogens.
- Q-9** Aqueous solution of methanol is azeotropic mixture because
 (a) it does not obey the Raoult's law
 (b) mixture cannot be separated by sublimation
 (c) mixture can be separated by distillation
 (d) greater volume than the volume of component
- Q-10** Elimination of bromine from 2-bromobutane results in the formation of
 (a) predominantly 2-butyne (b) predominantly 1-butene (c) predominantly 2-butyne

Answer the following questions:-

- Q-12** Draw the structure of DDT
Q-13 What is reverse osmosis .
Q-14 Why chloroform is kept in air tight dark coloured bottles
Q-15 Name the cell which was used in appolo space mission
Q-16 What is Henry's Law?
Q-17 Name the electrolyte used in lead storage battery
Q-18 What is corrosion?
Q-19 Write the formula of Rust
Q-20 What is Allyl halide?

Section -B

Q21. Define and explain osmotic pressure. At 25°C, the osmotic pressure of solution of an organic substance containing 1.425 g per 100 ml of water was found to be 760 mm of mercury. Calculate the molecular weight of the substance. (The value of $R = 0.0821 \text{ litre atm mol}^{-1} \text{ K}^{-1}$.)

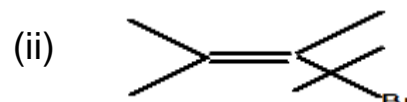
OR

How Cl_2 is manufactured by Deacon,s process. Write with reaction

Q22. A solution of glycol, containing 1.82 g of glycol per litre, has an osmotic pressure of 5.02atm at 10 °C. What is the molecular weight of glycerol?

OR

Write I.U.P.A.C names: (i) $K_4 [Fe F_6]$



Q23. Carry out following conversions (any two)

- (i) Propene to propan-2-ol

- (ii) Propene to propan-1-ol
- (iii) Benzene Diazonium Chloride to chloro Benzene
- (iv) Ethyl Chloride to Ethyl Fluoride

Q24. Both $[\text{Ni}(\text{CN})_4]^{2-}$ and $[\text{Ni}(\text{CO})_4]$ are diamagnetic but having different shapes Why?

OR

Account for the following

- (i) Why alkyl halide on reaction with KCN to form cyanide while on Reaction with AgCN to form Isocyanide ?
- (ii) Why person feels anoxia at high altitude ?

Q25. Complete the following chemical reactions equations:-

- (i) $\text{CH}_3\text{Br} + \text{NaI} \longrightarrow$
- (ii) $(\text{CH}_3)_3\text{CBr} + \text{KOH (alc)} \longrightarrow$
- (iii) $\text{CH}_2=\text{CH}-\text{CH}_3 + \text{HBr} \longrightarrow$
- (iv) $\text{C}_2\text{H}_5\text{Cl} + \text{AgF} \longrightarrow$

OR

Answer the following questions

- (i) Out of molarity and molality which one depends on temperature
 - (ii) Why ethanol is added in the bottles of chloroform
 - (iii) What is Swarts reaction ?
 - (iv) Write Finkelstein reaction.
 - (v) Write Balz Schiemann's Reactions
- Q26. (a) Arrange the following compounds in an increasing order of acidic strengths: $\text{CH}_3\text{CH}_2\text{CH}(\text{Br})\text{COOH}$, $\text{CH}_3\text{CH}(\text{Br})\text{CH}_2\text{COOH}$, $(\text{CH}_3)_2\text{CHCOOH}$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$.
- (b) Write chemical equation when PtF_6 and xenon are mixed together.

Or

What is monomer of Bakelite

- Q27. (a) State two advantages of H₂-O₂ fuel cell over ordinary cell.
- (b) A copper-silver cell is set up. The copper ion concentration in it is 0.10M. The concentration of silver ion is not known. The cell potential measured is 0.422V. Determine the concentration of silver ion the cell. (Given: $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}$ and $E^\circ_{\text{Ag}^+/\text{Ag}} = +0.80\text{V}$)

Section -C

Q28. Calculate the amount of KCl which must be added to 100g of water so that water freezes at -2.0°C . Assume that KCl undergoes complete dissociation.

OR

Indicate the type of isomerism exhibited by the following complexes and draw the structures for these isomers:

[Co(en)₂Cl₂] (ii) [Co(NH₃)₃(NO₂)₃] (iii) [Co(en)₃]Cl₃.

Q29. Outline the principles of the following:

- (i) Zone refining
- (ii) Paper chromatography.

Q30. (a) Why aryl halides are extremely less reactive towards nucleophilic Substitution reaction?

(b) In the following pairs of halogens compounds, which compound undergoes faster S_N1 reaction?

Q31. (A) Distinguish b/w following pairs

- (a). Phenol & Benzoquinone
 - (b).propan-2-ol to propanone
- (B) Write the mechanism of formation of Esterification.

Q32. Account for the following:

- (i) Aniline does not undergo friedel-crafts reaction.
- (ii) Methylamine in water reacts with ferric chloride to precipitate hydrated ferric oxide.

Q-33 Explain the following with an example.

- (a) Coupling reaction.
- (b) Reimer-Tiemann reaction.
- (c)Williamson synthesis.

OR

Write the steps involved in the preparation of:

- (i) K₂Cr₂O₇ from Chromite ore.
- (ii) KMnO₄ from Pyrolusite ore .

Q34. Write short notes on the following:

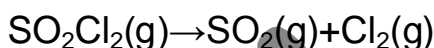
- (a) Froth Floatation process.
- (b)Electrophoresis.
- (c) Zeta potential.

Section –D

Q35. Write only chemical reactions

- A. Rosenmund reduction B. Carbyl amine reaction
 C. Hoffmann's reaction D. Cannizzaro's Rⁿ E. Wolff Kishner reduction
 OR

The following data were obtained during the first order thermal decomposition of SO₂Cl₂ at constant volume.



Experiment	Time/s	Total pressure/atm
1	0	0.5
2	100	0.6

Calculate the rate of the reaction when total pressure is 0.65 atm.

Q36. (a) Differentiate between the thermoplastic and thermosetting polymers.
 (b) What are biodegradable polymers? Give two examples.

OR

(a) Write the steps involved in the preparation of:

(i) K₂Cr₂O₇ from Na₂CrO₄.

(ii) KMnO₄ from K₂MnO₄.

(c) What is meant lanthanoid contraction? What effect does it have on the chemistry of the elements which follow lanthanoids?

Q37. An organic compound 'A' contains 69.77% carbon, 11.63% hydrogen and the rest is oxygen. The molecular mass of 'A' is 86. It does not reduce Tollen's reagent but forms an addition compound with sodium hydrogen sulphite. 'A' gives a positive iodoform test. On vigorous oxidation 'A' gives ethanoic and propanoic acids. Deduce the possible structure of molecule of 'A'.

OR

State the function along with one example each of:

- (i) Antihistamines (ii) Antioxidants (iii) Tranquilizers.

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