

**CHEMISTRY**  
**(SCIENCE PAPER – 2)**

*Maximum Marks: 80*

*Time allowed: Two hours*

*Answers to this Paper must be written on the paper provided separately.*

*You will **not** be allowed to write during first 15 minutes.*

*This time is to be spent in reading the question paper.*

*The time given at the head of this Paper is the time allowed for writing the answers.*

*Section A is compulsory. Attempt any four questions from Section B.*

*The intended marks for questions or parts of questions are given in brackets [ ].*

**SECTION A (40 Marks)**

*(Attempt all questions from this Section.)*

**Question 1**

Choose the correct answers to the questions from the given options.

[15]

(Do not copy the questions, write the correct answers only.)

- (i) Unsaturated hydrocarbons undergo:
- (a) Addition reaction
  - (b) Substitution reaction
  - (c) Oxidation reaction
  - (d) Redox reaction
- (ii) In the 2<sup>nd</sup> period Neon has maximum Ionization Potential because:
- (a) It has unstable electronic configuration.
  - (b) It easily accepts electrons.
  - (c) It easily loses electrons.
  - (d) The outer most shell is completely filled.

This paper consists of 12 printed pages.

- (iii) Copper, Zinc and Tin are the metals alloyed to form:
- Duralumin
  - Brass
  - Bronze
  - Solder
- (iv) The metal hydroxide which reacts with both acids and alkalis to form salt and water is:
- Calcium hydroxide
  - Magnesium hydroxide
  - Aluminium hydroxide
  - Ferrie hydroxide
- (v) Reaction of an alcohol with a carboxylic acid in the presence of concentrated  $H_2SO_4$  is termed as:
- Halogenation
  - Esterification
  - Hydrogenation
  - Dehydrohalogenation
- (vi) Conversion of Ethanol to Ethene by the action of concentrated sulphuric acid involves:
- Dehydration
  - Dehydrogenation
  - Dehydrohalogenation
  - Hydrolysis
- (vii) The oxidizing agent in the equation  $S + 2H_2SO_4 \rightarrow 3SO_2 + 2H_2O$  is:
- Sulphur
  - Sulphuric acid
  - Sulphur dioxide
  - Water

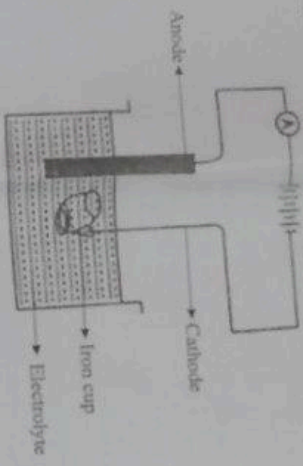
- (viii) Electron Affinity is maximum in:
- Mg
  - Ar
  - Li
  - Br
- (ix) The compound that is not a constituent of the electrolytic mixture used in the Hall-Heroult's process is:
- $Al_2O_3$
  - $NaAlO_2$
  - $Na_3AlF_6$
  - $CaF_2$
- (x) On passing ammonia gas over heated copper oxide for some time, a reddish-brown residue is left behind. What property of ammonia is demonstrated here?
- Basic property
  - Oxidising property
  - Reducing property
  - Acidic property
- (xi) Rotten egg smell is due to the liberation of:
- HCl gas
  - $H_2S$  gas
  - $Cl_2$  gas
  - $SO_2$  gas



- (xii) Ammonia gas is collected by downward displacement of air since ammonia is:
- very slightly soluble in water.
  - heavier than air.
  - lighter than air.
  - insoluble in water.
- (xiii) Which of the following would occupy 22.4 litres at S.T.P.?
- 12g of oxygen gas
  - 2 moles of hydrogen gas
  - $6.022 \times 10^{23}$  molecules of ammonia
- 1 & 2
  - 1 & 3
  - 2 & 3
  - 1, 2 & 3
- [Atomic weights: O = 16, H = 1, N = 14]
- (xiv) In the molecule of water, oxygen atom has:
- One shared pair of electrons.
  - Three shared pairs of electrons.
  - Two lone pairs of electrons.
  - One lone pair of electrons.
- (xv) A mineral from which the metal can be extracted economically and conveniently is known as:
- Matrix
  - Ore
  - Flux
  - Alloy

**Question 1**

(1) The following sketch represents the electroplating of an iron cup with Nickel metal. Study the diagram and answer the following questions:



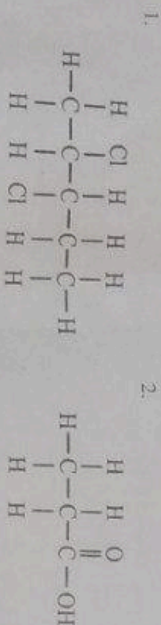
- During electroplating the iron cup is placed at the cathode. Why?
  - Name the ion that **must** be present in the electrolyte.
  - State one condition that is necessary to ensure that the deposit is smooth, firm and even.
  - Write the reaction taking place at the cathode.
  - What change would you observe at the anode?
- (ii) Match the *Column A* with *Column B*.
- |   |  |
|---|--|
| <p><i>Column A</i></p> <ol style="list-style-type: none"> <li>Water</li> <li>Alkali metal</li> <li>Halogen</li> <li>Calcium oxide</li> <li>Weak acid</li> </ol> | <p><i>Column B</i></p> <ol style="list-style-type: none"> <li>Lithium</li> <li>Iodine</li> <li>Covalent compound</li> <li>Acetic acid</li> <li>Ionic compound</li> <li>Sulphuric acid</li> </ol> |
|---|--|

(iii) Complete the following sentences by choosing the correct answer from the brackets: [5]

- (a) The salt that can be prepared by Direct Combination is \_\_\_\_\_  
[FeCl<sub>3</sub> / FeCl<sub>2</sub>]
- (b) The metallic oxide which can be reduced by using common reducing agents is \_\_\_\_\_  
[Fe<sub>2</sub>O<sub>3</sub> / Al<sub>2</sub>O<sub>3</sub>]
- (c) The metal nitrate which on thermal decomposition forms a black residue is \_\_\_\_\_  
[zinc nitrate / copper nitrate]
- (d) During the electrolysis of copper sulphate solution, if \_\_\_\_\_ is used as electrodes, the colour of the electrolyte does not fade. [copper / platinum]
- (e) The process of heating the concentrated ore in a limited supply or absence of air is \_\_\_\_\_ [roasting / calcination]
- (iv) State the terms for the following: [5]

- (a) The group obtained by removing one hydrogen atom from the parent alkane.
- (b) Two metal plates or wires through which the current enters and leaves the electrolytic cell.
- (c) The amount of substance which contains the same number of units as the number of atoms in carbon-12.
- (d) The tendency of an atom to pull a shared pair of electrons towards itself in a compound.
- (e) The formula which represents the simplest ratio between the atoms of elements present in a compound.

(v) Give the IUPAC names of the organic compounds represented by the structural formulae given below: [5]



(b) Draw the structural diagram for the following organic compounds:

- 3-methyl pentane
- propyne
- methanal

### SECTION B (40 Marks)

(Attempt any four questions from this Section.)

#### Question 3

(i) Rewrite the following statements by adding the correct word as shown in the example: [2]

Example:

Given Statement: Ammonia changes moist red litmus to blue.

Correct Statement: Aqueous ammonia changes moist red litmus to blue

- (a) Sulphuric acid acts as a dehydrating agent. [2]
- (b) Ammonia reacts with chlorine to give ammonium chloride and nitrogen.
- (ii) Identify **only** the anion present in the following compound: [2]
- (a) The compound on heating produces a colourless, odourless gas which turns lime water milky and has no effect on acidified potassium dichromate solution.
- (b) The solution of the compound which on treating with concentrated sulphuric acid and freshly prepared ferrous sulphate solution produces a brown ring.
- (iii) Mohan has three solutions P, Q and R having a pH of 13, 5 and 2 respectively. [3]
- Which of the above solutions P, Q or R:
- (a) will react with Magnesium to liberate hydrogen gas?
- (b) will liberate ammonia gas when it reacts with ammonium chloride?
- (c) will contain molecules as well as ions?

(iv) Hydrogen chloride gas is prepared in the laboratory by the action of concentrated sulphuric acid on sodium chloride.

- (a) Give balanced chemical equation for the above reaction.
- (b) State the method of collection of the gas formed above.
- (c) What is the property of sulphuric acid that makes it a suitable reagent for the reaction?