

# CHEMISTRY

## 2022 SEMESTER-2

Maximum Marks: 40

Time allowed: One and a half hours

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

You will not be allowed to write during the first 10 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.

Attempt all questions from Section- A and any three questions from Section- B.

The marks intended for questions or part of questions are given in brackets [ ]

### Section-A

(Attempt all questions)

#### Question 1.

Choose the correct answers to the questions from the given options. (Do not copy the question. Write the correct answer only.) [ 10]

- (i) The ore of Aluminium is :
- (a) Calamine (b) Haematite (c) Magnetite (d) Cryolite
- (iii) Hydrogen chloride gas is not collected over water, as :
- (a) It is highly soluble in water.  
(b) It is less soluble in water.  
(c) It is lighter than air.  
(d) It is heavier than air.
- (iii) An aqueous solution of ammonia is :
- (a) Neutral (b) Acidic  
(c) Basic (d) Amphoteric
- (iv) The acid which is least volatile is :
- (a) Hydrochloric acid  
(b) Nitric acid  
(c) Dilute sulphuric acid  
(d) Concentrated sulphuric acid
- (v) The gas formed, when calcium bisulphite reacts with dilute  $\text{HNO}_3$  :
- (a) Sulphur trioxide (b) Hydrogen (c) Sulphur dioxide (d) Hydrogen sulphide
- (vi) The IUPAC name of formic acid :
- (a) Propanoic acid (b) Methanoic acid (c) Ethanoic acid (d) Butanoic acid
- (vii) The metallic oxide which when reacts with  $\text{HCl}$  forms salt and water :
- (a) Carbon monoxide  
(b) Nitrous oxide

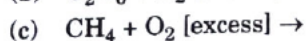
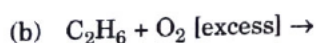
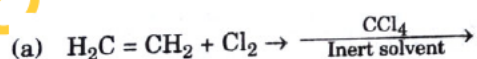
- (c) Ammonium hydroxide
- (d) Sodium oxide
- (viii) Vanadium pentoxide is used as a catalyst in the preparation of:
  - (a) Nitrogen gas
  - (b) Nitrogen dioxide gas
  - (c) Sulphur trioxide gas
  - (d) Carbon dioxide gas
- (ix) The Catalyst used for the conversion of Ethene to Ethane:
  - (a) Iron      (b) Nickel
  - (c) Cobalt    (d) Molybdenum
- (x) Substance which helps to lower the fusion point of the mixture in Hall Heroult Process :
  - (a) Coke
  - (b) Concentrated sodium hydroxide
  - (c) Fluorspar
  - (d) Concentrated potassium hydroxide

**Section-B**

(Attempt any three questions from this Section.)

**Question 2.**

- (i) Define: [2]
  - (a) Isomerism
  - (b) Ores
- (ii) Name the following :
  - (a) The property by which carbon links with itself to form a long chain.
  - (b) The saturated hydrocarbons having general formula  $C_nH_{2n-2}$
- (iii) Draw the structural diagram of. [3]
  - (a) pentanal
  - (b) propanol
  - (c) 2-butene
- (iv) Complete and balance the following chemical equations:



**Question 3.**

- (i) State the following : [2]
  - (a) A compound formed when excess ammonia gas reacts with chlorine.
  - (b) A substance added to water, to manufacture sulphuric acid in Contact process.

- (ii) Identify the gas P and Q in the reactions given below : [2]
- (a) A compound reacts with an acid to form gas P which has no effect on acidified  $K_2Cr_2O_7$  solution but turns lime water milky.
- (b) A metallic nitrate reacts on heating gives oxygen gas along with a coloured gas Q.
- (iii) State the observation for the following: (3)
- (a) Dry ammonia gas reacts with oxygen in the presence of a catalyst.
- (b) Excess chlorine gas reacts with ammonia gas.
- (c) Carbon reacts with hot concentrated nitric acid.
- (iv) Write balanced equation for the following conversions: [3]
- (a) Carbon from cane sugar and concentrated sulphuric acid.
- (b) Ferric nitrate from ferric hydroxide and nitric acid.
- (c) Ammonium sulphate from ammonium hydroxide and sulphuric acid.

**Question 4.**

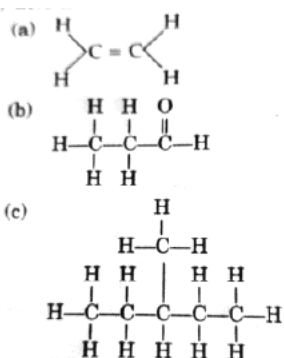
- (i) State the relevant reason for the following : [2]
- (a) Concentrated alkali is used for the concentration of bauxite ore.
- (b) Fused alumina is reduced to aluminium by electrolysis.
- (ii) State one use of the given alloys : [2]
- (a) Magnalium
- (b) Duralumin
- (iii) Complete the table given below which refers to the Laboratory preparation of Ammonia gas: [3]

Laboratory preparation	Reactants used	Products formed	Drying agent	Method of collection
Ammonia gas	(a) .....	Calcium chloride + water + ammonia	(b) .....	(c) .....

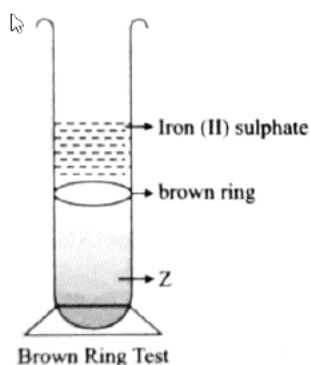
- (iv) Identify the terms for the following : [3]
- (a) The process used to purify Alumina by electrolytic reduction.
- (b) The experiment used to demonstrate the high solubility of HCl gas.
- (c) The chemical property of sulphuric acid to form two types of salts with an alkali.

**Question 5.**

- (i) Write the balanced chemical equation for the following: [2]
- (a) Action of heat on manganese dioxide and concentrated hydrochloric acid to form zinc chloride.
- (b) Zinc reacts with dilute hydrochloric acid to form zinc chloride.
- (ii) Select the right answer from the brackets and complete the statements : [2]
- In electrolysis of fused Alumina, the anode is made of (a) ..... [gas carbon/graphite] and the product formed at cathode is (b) ..... [oxygen/aluminium].
- (iii) Give the IUPAC name for the following : [3]



- (iv) Study the diagram, which shows the Brown Ring Test and answer the questions given below : [3]



- (a) Which ion is determined by Brown Ring Test?
- (b) Why is freshly prepared iron[II] sulphate used in the test?
- (c) Name the substance Z.

**Question 6.**

- (i) Distinguish between the following as directed. [2]
- (a) Sodium sulphite solution and sodium sulphate solution.  
[using dilute  $\text{H}_2\text{SO}_4$ ]
- (b) Lead salt solution and zinc salt solution, [using  $\text{NH}_4\text{OH}$  solution in excess]
- (ii) Give one word for the following statements : [2]
- (a) The compounds of various metals found in nature with earthy impurities.
- (b) A homogeneous mixture of two or more metals or a metal and a non-metal in specific ratios.
- (iii) Identify the acid in each case : [3]
- (a) The acid formed when Sulphur reacts with concentrated nitric acid,
- (b) An acid, which on adding to lead nitrate solution produces a white precipitate which is soluble on heating.
- (c) The acid formed when potassium nitrate reacts with a least volatile acid,
- (iv) Match column A with column B : [3]

Name (A)	Functional group (B)
1. Aldehyde	(a) —OH
2. Carboxylic acids	(b) —CHO
3. Alcohol	(c) —COOH