

I.C.S.E. BOARD TYPE - STD. IX SPECIMEN QUESTION PAPER

Time: 2 Hours

Section - I [40 Marks]

Compulsory: To be attempted by all candidates.

Question 1

- (a) From the list given below, select the correct answer for the questions (i) to (v) [5]
Brass; an aq. soln. of NaCl; Oil in water; Sodium chloride; Sodium chloride & sand.

- (i) A compound.
- (ii) A true solution.
- (iii) A heterogeneous solid-solid mixture.
- (iv) A homogeneous solid-solid mixture.
- (v) A colloidal solution.

- (b) Match the names of compounds in 'Column A' with their correct formulas [5]
from 'Column B'.

Column A

- (i) Iron [III] chloride
- (ii) Iron [III] oxide
- (iii) Iron [II] chloride
- (iv) Iron [III] sulphate
- (v) Iron [III] sulphide

Column B

- A: FeCl_2
- B: Fe_3O_4
- C: Fe_2O_3
- D: FeCl_3
- E: FeO
- F: FeS
- G: FeSO_4
- H: Fe_2S_3
- I: FeCl
- J: FeS_2
- K: $\text{Fe}_2(\text{SO}_4)_3$

- (c) 'Column A' gives the details of properties of certain elements in the different groups of the Periodic Table and 'Column B' - the elements of the Periodic Table. Copy and complete the table below to match the properties in 'Column A' with the elements in 'Column B'. [5]

Column A

- (i) Is the gaseous element in group 15 [VA]
- (ii) Is the liquid non-metallic element of group 17 [VIIA]
- (iii) Is the most electronegative element of group 17 [VIIA]
- (iv) Is an element of group 16 [VIA] which exists in allotropic forms
- (v) Has 4 electrons in its valence shell & is in group 14 [IVA]

Column B

- A: Fluorine
- B: Sulphur
- C: Carbon
- D: Nitrogen
- E: Bromine

Property	1	2	3	4	5
Element					

- (d) Identify the types of reactions A to E by matching them with the reactions given from 1 to 5. Write the letter of the correct answer using each letter only once. [5]

A: Thermal decomposition

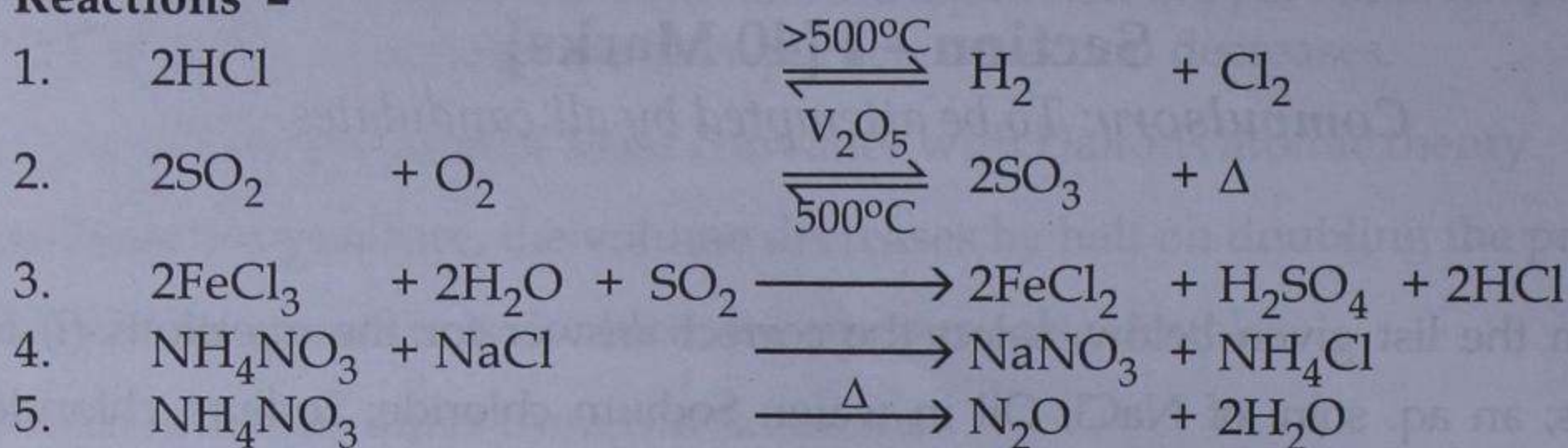
B: Thermal dissociation

C: Catalytic

D: Reduction

E: Double decomposition

Reactions -

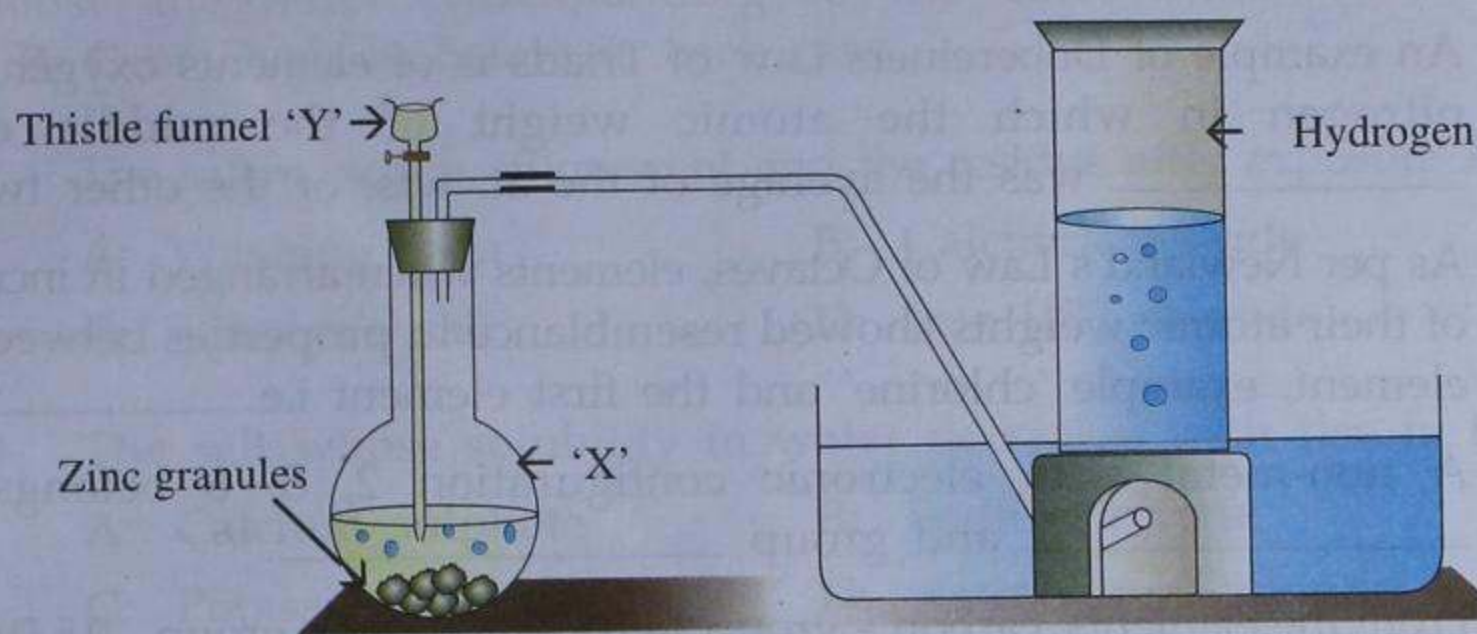


- (e) (i) State the law which relates between the pressure of a gas and the volume occupied by it. [5]
- (ii) At a pressure of 152 cm. Hg., a gas 'X' has a volume of 50 cc. At what pressure will the volume be 30 cc., temperature remaining constant throughout.
- (iii) The volume of a gas 'A' will double, if the temperature of the gas 'A' increased from 100°C to 200°C . State whether the statement is true or false.
- (f) Give reasons for the following: [5]
- (i) Chromatography can be used to separate colouring matter in ink.
- (ii) The physical properties of the isotopes of chlorine are different.
- (iii) The Modern Periodic Law was more acceptable than Mendeleeff's Periodic Law.
- (iv) A saturated solution can be converted to an unsaturated solution by heating.
- (v) Higher the biological oxygen demand [BOD] in water, the more the pollution.
- (g) Choose the correct word or letter from the brackets to complete the sentence and write *only* that down as the answer. [5]
- (i) During condensation the inter-particle attraction _____ [increases/decreases]
- (ii) Separation of benzene and toluene is achieved by _____ [fractional crystallization/distillation/fractional distillation]
- (iii) The element which shows variable valency is ____ [nickel/chromium/tin]
- (iv) The reaction of iron with steam, liberating hydrogen gas is a _____ [displacement / reversible / catalytic] reaction.
- (v) Unpolluted water has _____ [high/low] amount of dissolved oxygen in it.
- (h) Give balanced equation for the following conversions. [5]
- (i) Zinc to sodium zincate.
- (ii) Ozone to two molecules of oxygen gas.
- (iii) Hydrogen to ammonia.
- (iv) Sulphur trioxide to sulphuric acid – a component of acid rain.
- (v) Iron to iron [II] chloride.

Section - II [40 Marks]

Answer any four questions from this section.

Question 2



The apparatus above is set to obtain hydrogen gas in the laboratory

- (a) (i) Name the acid in flask 'X' added through the thistle funnel, which produces a metallic chloride and hydrogen. [5]
- (ii) Give an equation for the above reaction.
- (iii) Which impurities produced above, can be removed by passage through lead nitrate solution, in the above preparation of hydrogen.
- (iv) State the precautions in the collection of the gas, during the above preparation of hydrogen.
- (v) How is hydrogen collected in the above reaction.
- (b) Give reasons for the following: [2]
- (i) Hydrogen is not collected over air, even though it is lighter than air.
- (ii) The lower end of thistle funnel is dipped below the level of the flask.
- (c) State the position of the non-metal hydrogen in the periodic table and give the general group characteristics with reference to: [2]
- (i) Valency electrons.
- (ii) Ion formation.
- (d) Give a balanced equation for the conversion of water gas to hydrogen - in the Bosch process. [1]

Question 3

- (a) An atom of magnesium has an 'atomic number' 12 & 'mass number' 24. [5]
- (i) State its electronic configuration and valency.
- (ii) Give a reason why it is considered a 'metal'.
- (iii) Give a reason why chlorine [at. no. 17] is considered a 'non-metal'.
- (iv) State the number of 'nucleons' in the nucleus of the atom of magnesium.
- (v) Give a reason why the 'L shell' of magnesium has 8 electrons and not 10.

(b) The basis of classification of elements was to put together elements which showed maximum resemblance. Complete the statements given below by filling in the blanks with correct word/s. [5]

- (i) An example of Dobereiners Law of Triads is of elements oxygen, carbon and nitrogen in which the atomic weight of the middle element i.e. _____ was the average of the at. wts. of the other two elements.
- (ii) As per Newland's Law of Octaves, elements when arranged in increasing order of their atomic weights showed resemblance in properties between the eighth element, example 'chlorine' and the first element i.e. _____.
- (iii) A non-metal with electronic configuration 2, 8, 6 belongs to period _____ and group _____.
- (iv) From the elements, carbon - group 14 [IVA], nitrogen group - 15 [VA], oxygen - group 16 [VIA] & sulphur - group 16 [VIA] the elements which shows allotropy are _____.
- (v) The defects in Mendeleeff's Periodic Table disappear if the basis of classification of elements is changed from atomic _____ to atomic _____.

Question 4

(a) Select the correct word from the words in bracket to complete each statement. [5]

- (i) Liquefaction, the process of change from gaseous state to liquid state is also termed as _____ [fusion/condensation/solidification].
- (ii) Inter-particle attraction is low in _____ [sodium chloride/ammonium chloride].
- (iii) The absolute scale of temperature has its zero at _____ [273°C / -273°C / 0°C].
- (iv) The formula of the phosphate radical is _____ [PO_3^{3-} / PO_4^{3-} / PO_4^{2-}].
- (v) Low specific conductance of water indicates _____ [less/more] pollution in water.

(b) Match the methods of separation A to G and the type of mixture H or I with the constituent of the mixture 1 to 5. [the first one is done for you]. [5]

Constituent of mixture

Method of separation

Type of mixture

Iron + sulphur

A: Solvent & filtration
[solvent extraction]

H: Homogeneous

1. KCl + Sand

B: Centrifugation

I: Heterogeneous

2. KCl from its aq. soln.

C: Fractional distillation

3. Pure water from water containing dissolved KCl

D: Separating funnel

E: Distillation

4. Cream + Milk

F: Evaporation

5. CCl_4 + H_2O

G: Magnetic separation

First answer: G - I.

Question 5

- (a) Choose the letter corresponding to the correct answer from the choice A, B, C or D given below in each case. [5]

(i) The salt which is efflorescent and the residue after exposure is an anhydrate.
A: Washing soda B: Calcium chloride
C: Glauber's salt D: Iron [III] chloride

(ii) The salt whose solubility in water decreases with rise in temperature.
A: Calcium sulphate B: Sodium nitrate
C: Potassium nitrate D: Ammonium chloride

(iii) The anhydrous salt which changes colour on reaction with water.
A: Calcium sulphate B: Sodium sulphate
C: Cobalt chloride D: Calcium chloride

(iv) The gas which is responsible for global warming.
A: Nitric oxide B: Nitrogen dioxide
C: Nitrous oxide D: Ammonia

(v) The maximum number of electrons which can be present in the M-shell of an atom.
A: Two B: Thirty-two
C: Eight D: Eighteen

- (b) Select the correct answer from the words in brackets. [5]

(i) An acidic gas which is a non-supporter of combustion.
[hydrogen, carbon monoxide, hydrogen chloride]

(ii) The formation of hydrogen and oxygen from acidified water is an example of a/an -
[photochemical reaction, electrochemical reaction, endothermic reaction]

(iii) A reaction in which mercury [II] oxide, breaks up on heating to give mercury and oxygen is an example of -
[thermal dissociation, thermal decomposition, displacement reaction]

(iv) In the experiment to show that a candle gains weight on burning, the water vapour evolved is absorbed in -
[sodium carbonate, lead chloride, anhydrous calcium chloride]

(v) Ozone in presence of U.V. light gives -
[ozone + nascent oxygen, oxygen + nascent oxygen, oxygen + two atoms of nascent oxygen]

Question 6

- (a) Give balanced equations for the following acids obtained using water as one of reactants. [5]
- (i) Sulphurous acid
 - (ii) Sulphuric acid
 - (iii) Carbonic acid
 - (iv) Nitrous acid
 - (v) Hypochlorous acid
- (b) Underline the reduced product in each of the following reactions. [2]
- (i) $\text{Cl}_2 + 2\text{H}_2\text{O} + \text{SO}_2 \rightarrow 2\text{HCl} + \text{H}_2\text{SO}_4$
 - (ii) $\text{Br}_2 + \text{H}_2\text{S} \rightarrow \text{S} + 2\text{HBr}$
- (c) State two major atmospheric pollutants in each case responsible for - [3]
- (i) Acid rain
 - (ii) Global warming
 - (iii) Ozone depletion

Question 7

- (a) Copper [II] nitrate is heated in a hard glass test tube. [3]
- (i) State the colour change in the crystals on heating.
 - (ii) The coloured acidic gas evolved on heating, turns KI paper brown. Give the equation for the reaction.
 - (iii) The colourless gas evolved on heating, turns a colourless solution brown, when absorbed in it. Name the colourless solution.
- (b) Select the correct answer from words in bracket in each statement given below. [3]
- (i) The nitrate which on thermal decomposition which leaves a residue which is a basic oxide. [copper nitrate / zinc nitrate / lead nitrate]
 - (ii) A salt which reacts with dilute sulphuric acid, liberating a gas which turns lead acetate paper silvery black. [sodium sulphite / sodium sulphate / sodium sulphide]
 - (iii) A substance which reacts with dilute hydrochloric acid liberating a gas which burns quietly in air with a pale blue flame. [copper / magnesium / silver]
- (c) Write the equations for the preparation of the following salt solutions using a dilute acid. [4]
- (i) Sodium sulphate from sodium carbonate.
 - (ii) Sodium chloride from sodium bicarbonate.
 - (iii) Calcium nitrate from calcium bicarbonate.
 - (iv) Iron [II] sulphate from iron [II] sulphide.

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