ICSE Chemistry: Model Paper 16

Answers to this Paper must be written on the paper provided separately.
You will not be allowed to write during the 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 I is compulsory. Attempt any four questions from Section II.
The intended marks for questions or parts of questions are given in brackets [].

SECTION I (40 Marks)
*Attempt **all** questions from this Section*

Question 1:

a) a) The following questions are pertaining to the activity series Name a metal: [5]
   i) Which reacts readily with cold water giving hydrogen
   ii) Which displays hydrogen from dilute sulphuric acid or hydrochloric acid.
   iii) Whose hydroxide is a strong base
   iv) Whose carbonate does not decompose on heating.
   v) Which displaces iron from iron(III) oxide or ferric oxide.

b) Carry out the following conversions. [5]
   i) Formaldehyde ⟶ Methane
   ii) Calcium Carbide ⟶ Acetylene
   iii) Acetylene ⟶ Acetylene tetrabromide
   iv) Acetylene ⟶ Benzene
   v) Methyliodide ⟶ Methane

C) (i). Define a fertilizer. [1]
(ii). Name three main classes of fertilizers and give one example of each type. [3]
(iii). Give balanced equations to prepare the following. [3]
a) Superphosphate of lime
b) A fertilizer, using a basic gas and an acidic gas only
c) Nitrolim
iv. Choose the most appropriate alternative and give reason for your choice. [3]
1. Drying agent for ammonia : Quick lime/ Phosphorus Pentoxide / Conc H_2SO_4
2. Collection of Nitrogen gas : upward/downward displacement of air/ downward displacement of water.
3. Collection of ammonia gas : upward/downward displacement of air/ downward displacement of water.

D) Sulphuric acid may act as each of the following. [5]
a) An acid forming sulphate when soluble in water.
b) A compound forming sulphate which are insoluble in water.
c) A dehydrating agent.
d) A drying agent
e) An oxidising agent.
Which of the above properties (a) to (e) is shown by sulphuric acid when
i) Conc H_2SO_4 acid is added to sugar ?
ii) Dil H_2SO_4 acid reacts with lead nitrate solution ?

iii) Dil sulphuric acid is added to sodium hydroxide solution.
iv) Hydrogen sulphide gas is passed through concentrated sulphuric acid?

E) The following questions relate to the Nitrogen Cycle. [5]
I) What are the soluble nitrogen compounds absorbed by the roots of plants?
II) What kind of plants directly absorbs nitrogen from the atmosphere?
III) What term is applied to the conversion of atmospheric nitrogen to useful compounds of nitrogen ?
IV) Compounds such as ammonium nitrate urea and superphosphate are used to replace nitrogen and other elements lost from the soil as a result of cultivation . What is the common name given to these compounds?
V) What substance are used in making urea?

F) i) What is a chemical bond? (1 Marks)
ii) What is chlorine water?(1 Marks)
iii) "A base can be prepared by using base." (1 Marks)
Justify this statement by giving one example with balanced equation.
iv) [7 Marks]

i) For the conversion A, name 2 other reactants required
ii) How can conversion B be brought about?
iii) Write a balanced equation for conversion C if it is brought by direct combination.
iv) State the conditions necessary for conversions D and E.
v) How does sodium hydroxide act in distinguishing iron(II) chloride
and iron(III) Chloride Sol.?
vi) What is the chemical process involved in using moist chlorine as a bleaching agent?
vii) Why does bleaching powder smell of chlorine?

Section II

Q- 2 A) Nitric acid is manufactured by Ostwald's process
i) Give a balanced equation of the reaction in each chamber [3]
Give reasons for the following. [3]
ii) The ammonia air mixture contains a higher ratio of air.
iii)The gases are cool to temperature around 500 c before entering the oxidation chamber.
iv)The absorption tower is filled with quartz , packed in layers.
B) I) Compare the solubility of ammonia and nitrogen gas in water.
ii) Give 2 general uses of ammonia. [2]
C) Name one example of each of the following substances obtained from chlorine.
i) A polymer or plastic [2]
ii) A disinfectant and germicide.
Q- 3
A) Write equations for each of the following reactions when (4)
i) Water is added to aluminium nitride.
ii) Aq. Potassium hydroxide is added to methylbromide.
iii) Soda lime is added to sodium acetate.
iv) Conc sulphuric acid is added to ethylalcohol at 170^0 c

B) Explain the following with suitable examples [4]
i) Pyrolysis or cracking
ii) Polymerisation

B) How would you distinguish metallic sulphate and a sulphide using dil mineral acid ? [2]
Q-4 A) Give a balanced equation and explain in brief the method involved in the preparation of the following salts. [10]
i) A soluble sodium salt by neutralization.
ii) An insoluble lead salt by precipitation (double decomposition)
iii) A salt by direct combination of elements.
iv) A soluble salt from insoluble copper hydroxide.
v) A soluble salt from an active metal.

B) Differentiate between strong alkali and weak alkali
C) Give two uses each of (a) Ethane (b) Acetylene
D) The pressure on one mole of a gas at s.t.p is doubled and the temperature raised to 546k. What is the final volume of gas?

Q-5 A) Distinguish between 'thermal decompostion and thermal dissociation' (2)
B) Name and outline the large scale method of obtaining ammonia and also state the necessary conditions to carry out the process.(5)
C) What are isomers ? (1)
D) How is Galvanization done ? (2)

Q 6 (I) Calculate the mass of water formed by reduction of 20g of copper
II)Oxide with hydrogen on heating.
$CuO + H_2O \rightarrow Cu + H_2O$ [Cu =63.5, O =16 H=1]
ii)Calculate the mass of nitogen supplied to the soil by 5 kg's of area [O=16, N=14, C=12, H=1]
iii) Calculate the wt of substance 'x' which in the gaseous form occupies 10 litres at 27^0cand 700 mm pressure. Mol wt of 'x' is 60
iv) A compound of carbon, hydrogen and oxygen contains 40% carbom, 6.7% hydrogen and 53.3% oxygen. If its
V.D. is 30 calculate its mol.formula.

Q-7 A) In Hall -Heroult's process of electrolytic reduction of fused alumina-
Give rasons for the following.
i) Electrolytic reduction is difficult to conduct at the fusion temperature of the electrolytic mixture .
ii) Fused cryolite along with calcium fluoride is added to the electrolytic mixture.
iii) Electrolytic reduction of alumina is a continuos process .
B) Starting from aluminium how will you obtain :
i) Hydrogen using a natural liquid.
ii) Sulphur dioxide using an acid.

C) What property of Al makes it useful for the following purposes.
i) Manufacture of utensils
ii) Manufacture of paints applied to electric poles.