INSTRUCTIONS

1. You are required to utilize the first ten minutes for reading the question paper.
2. You will not be allowed to write during this time.
3. Write the main question number and the sub-question numbers correctly.

SECTION A (40 MARKS)

Q 1 Choose the best option. (1x10=10)

1 In which substance are the particles close together and slowly moving past each other?
   A air
   B ice
   C steam
   D water

2 A student was provided with only a thermometer, a stopwatch and a beaker. What could the student measure?
   A 10.5 g solid and 24.8 cm$^3$ liquid
   B 10.5 g solid and 25 °C
   C 24.8 cm$^3$ liquid and 45 seconds
   D 25 °C and 45 seconds

3 The diagram shows the electronic structures of atoms P and Q. Key
P and Q combine to form a molecule. What is the formula of this molecule?
A PQ₄  B PQ  C P₂Q  D P₄Q

4 Some reactions are listed.
methane + oxygen → carbon dioxide + water
sodium + water → sodium hydroxide + hydrogen
magnesium + hydrochloric acid → magnesium chloride + hydrogen

Which word correctly describes all of these reactions?
A combustion  B endothermic  C exothermic  D neutralisation

5 Which type of reaction always forms a salt and water?
A exothermic  B neutralisation  C oxidation  D polymerization

6 In the activity series of metals, which is the most reactive metal?
A Na  B K  C Mg  D Ag

2 Which atom has one more electrons than an atom of a noble gas?
A aluminium  B bromine  C Sodium  D rubidium

8 A liquid turns white anhydrous copper sulfate blue and has a boiling point of 101°C. Which could be the identity of the liquid?
A alcohol  B petrol  C salt solution  D pure water

9 When glucose is oxidized, water is formed together with
A carbon dioxide  B ethene  C methane  D oxygen
10 Which change does not increase the speed of reaction between zinc and hydrochloric acid?
A adding a catalyst
B decreasing the temperature
C increasing the amount of zinc
D using more acid

Q 2 a) Write the electronic configuration for the following elements: $^{40}$Ca, $^{23}$Na, $^{24}$Mg, $^{12}$C, $^{35}$Cl
b) Write the formulae for:
Ammonium Bicarbonate, Aluminium Sulphide, Aluminium Oxide, Cobalt Chloride, Potassium Iodide

Q 3 Answer the following:
a) Write the structures for: $\text{C}_2\text{H}_4$, $\text{C}_3\text{H}_8$, $\text{C}_3\text{H}_7\text{OH}$, $\text{C}_4\text{H}_9\text{COOH}$, $\text{C}_6\text{H}_5\text{CHO}$, $\text{C}_6\text{H}_{10}$, $\text{C}_3\text{H}_4$,
b) In a molecule of $\text{C}_6\text{H}_{12}\text{O}_6$, calculate the percentage of Oxygen in weight (C=12, O=16 and H=1 amu).

Q 4 Write balanced equations with conditions for:
a) Water gas reacts with steam
b) Ammonia is oxidized
c) Butane reacts with oxygen
d) Carbon reacts with water
e) Plants combine Carbon di oxide and Water

SECTION B (40 MARKS)

Q 5 Write short notes on:
a) Ion
b) Decomposition reaction
c) Metals
d) Electroplating
e) Alkynes

Q 6 Differentiate between:
a) Bases and Alkalis
b) Variable Valency and Constant Valency
c) Monobasic acid and Triacidic base
d) Cathode and Anode
e) Substitution and Addition reactions

Q 7 Give reasons for the following:
a) Why do you need both atomic mass and atomic number for an element?
b) Why we consider milk to be a mixture?
c) During Electroplating, the article to be plated is always made the cathode. Why?
d) Why Sodium gains weight after burning?
e) Ice floats in water. Why?
Q 8 Answer the following questions based on the following gas preparation

i) What is(are) a possible reactant? (1)
ii) What is (are) a possible products? (1)
iii) Do you need a catalyst? (1)
iv) How is the gas collected here? Why? (1)
v) Could it be collected by displacing air? Justify. (1)
vi) Write the equation balanced. (1)
vii) Write two other reactions that you can use to make this gas? (2)
viii) How are two atoms of this gas linked in a molecule? (2)