

**Quiz Topic: Chemical Changes**

**Possible Score: 30 Marks**

**Section A: MCQ (5 Marks)**

1. The burning of a candle is a chemical reaction because

- A. there is less wax left
- B. the molecules move closer to each other
- C. new products are formed
- D. the wax in the candle melts

2. Which of the following processes does not involve a chemical reaction?

- A. Frying an egg
- B. Dissolving of sugar
- C. Burning of charcoal
- D. Passing electricity through sodium chloride solution

3. In which of the following is the observation of bubbles a sign of chemical reaction?

- A. When a new bottle of fizzy drink is opened.
- B. When water is heated.
- C. When hydrogen peroxide decomposes into water and oxygen.
- D. When gases bubble out of air pump in an aquarium.

4. A chemical change occurs when chalk powder (calcium carbonate) is heated. The chemical reaction that occurs can be represented by the chemical word equation below.



This type of reaction is known as

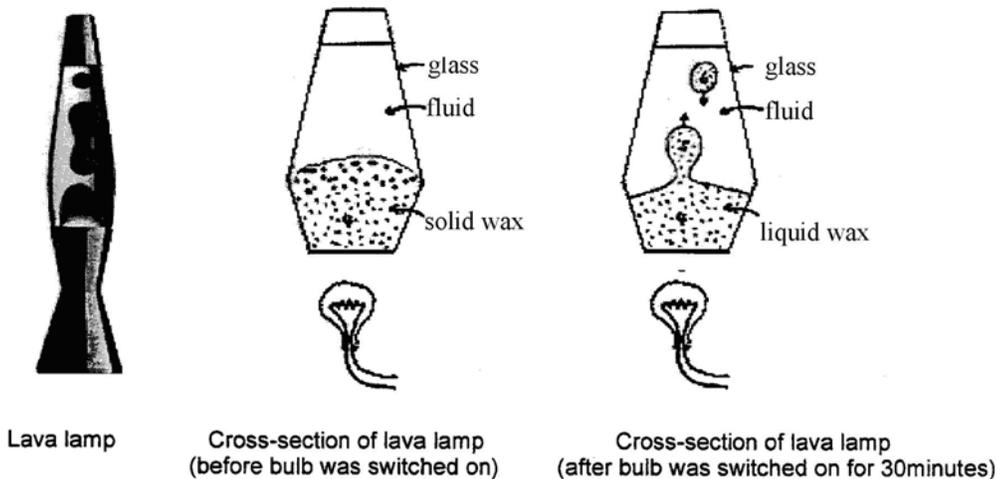
- A. combustion
- B. electrolysis
- C. oxidation
- D. thermal decomposition

5. A light bulb makes use of the \_\_\_\_\_ effect of an electric current.

- A. lighting
- B. heating
- C. magnetic
- D. chemical

Section B: Structured Questions (25 Marks)

1. The diagrams below show a lava lamp and its cross-sections before and after switching on the lamp.



- (a) Is this a chemical change or physical change? (1)
- (b) Name the type of change that had occurred. (1)
2. State whether each of the below statements is true or false. If the statement is false, explain why it is incorrect.
- (a) A chemical change is always irreversible. (1)
- (b) When sugar is added to water, a physical change occurs. (1)
- (c) Global warming is caused by carbon monoxide gas. (1)
3. Passing electricity through a substance can result in a chemical change.
- (a) Give an example of a reaction in which a compound is broken up into its elements through the use of electricity. (1)
- (b) State the compound and the elements involved. (2)
4. A student heating some substances noted the following observations:
- When solid iodine is heated, violet vapour is seen.
  - When sugar is heated, a black solid is obtained.
- (a) Name the process taking place in each case. (1)
- (b) Give 1 similarity and 1 difference between these two processes. (2)

5. Chemical reactions can be represented by word equations. Write word equations for the following reactions.

(a) When carbon is burnt in air, carbon dioxide is formed. (1)

(b) When exposed to light, silver bromide coated on the film breaks down to form silver and bromine. (1)

(c) When ammonium chloride is heated, ammonia and hydrogen chloride are formed. (1)

(d) When a mixture of iron and sulphur is heated, iron sulphide is formed. (1)

6. With regards to question 5 above, state which of the reactions involve:

(a) Combustion (1)

(b) Combination (1)

(c) Decomposition (1)

7. Substance X is a grey solid. Various tests were carried out on substance X and the observation was recorded in the table below.

	<b>Test</b>	<b>Observation</b>
(i)	Heating X using a hot flame.	X burns with bright white flame; white residue left behind.
(ii)	Adding X into a few cm <sup>3</sup> of hydrochloric acid in a test tube	Lot of bubbles produced. X disappeared into the acid. The solution remained colourless.
(iii)	Testing the gas produced in (ii), if any	“Pop” sound heard when burning splint was placed at the mouth of the test tube.

(a) Write a chemical word equation for the reaction that took place in (i). Hint: The white residue is magnesium oxide. (1)

(b) State whether (ii) is a chemical or physical change. (1)

(c) What can you deduce from the observation made in (iii)? (1)

8. Complete the table below with regards to two common air pollutants. (4)

<b>Air Pollutant</b>	<b>Source of Pollutant</b>	<b>Harmful Effects of Pollutant</b>
Carbon dioxide		
Oxides of nitrogen		

**Answers:**

1	2	3	4	5
C	B	C	D	B

1(a) Physical change.

(b) Melting.

2(a) - False.

- Some chemical changes are reversible under certain conditions.

(b) True.

(c) - False.

- Global warming is caused by the increasing amount of carbon dioxide.

3(a) Example: Electrolysis of water.

(b) - Compound: Water

- Elements: Hydrogen and oxygen

4(a) - Iodine: Sublimation

- Sugar: Thermal decomposition

(b) - Similarity: Both require the supply of heat.

- Difference (any of the following):

- Sublimation is a physical change whereas decomposition is a chemical change.
- Sublimation is reversible whereas decomposition is irreversible.
- Sublimation involves only a change in state of the substance whereas decomposition involves a new substance being formed.

5(a) Carbon + Oxygen  $\rightarrow$  Carbon dioxide

(b) Silver bromide  $\rightarrow$  Silver + Bromine

(c) Ammonium chloride  $\rightarrow$  Ammonia + Hydrogen chloride

(d) Iron + Sulphur  $\rightarrow$  Iron sulphide

6(a) Reaction (a)

(b) Reactions (a) and (d)

(c) Reactions (b) and (c)

7(a) Magnesium + Oxygen  $\rightarrow$  Magnesium Oxide

(b) Chemical change

(c) Hydrogen gas produced.

8.

<b>Air Pollutant</b>	<b>Source of Pollutant</b>	<b>Harmful effects of Pollutant</b>
Carbon monoxide	Incomplete combustion of fuel in motor vehicle engines.	Combines with haemoglobin in the blood, thus depriving the blood of oxygen, and possibly leading to death.
Oxides of nitrogen	Reaction of nitrogen and oxygen in car engines at high temperature.	Dissolved in rainwater to form acid rain, which corrodes buildings.