(Q.) Name two fuels which are used for running automobiles. (1 Mark)

(**Ans**) Petrol and Compressed Natural Gas (CNG).

(Q.) Define combustion. (1 Mark)

Ans) Combustion is a chemical process in which a substance reacts with oxygen of air to produce heat and light.

(Q.) Write a difference between burning of a candle and the burning of coal. (1 Mark)

(**Ans**) A candle burns with a flame while coal does not burn with a flame.

(Q.) What do you understand by combustible substances or fuels? (1 Mark)

(**Ans**) Those substances which burn or catch fire easily are called combustible substances or fuels e.g. wood, coal, etc.

(Q.) Is burning of magnesium combustion? (1 Mark)

(**Ans**) Yes, burning of magnesium is a combustion processas it produces heat and light.

(Q.) Give two examples of non-combustible substances. (1 Mark)

(**Ans**) Glass and Stone.

(Q.) What is essential for combustion? (1 Mark)

(**Ans**) Air or oxygen

(Q.) What do you mean by ignition temperature? (1 Mark)

(**Ans**) The minimum temperature at which a substance catches fire and starts burning is called **ignition temperature.**

(Q.) Does a matchstick burn by itself? (1 Mark)

(**Ans**) No, a matchstick does not burn by itself because the room temperature is lower than its ignition temperature.

(Q.) What is the composition of the head of the matchstick? (1 Mark)

(**Ans**) The head of the matchstick contains antimony trisulphide and potassium chlorate.

(Q.) Which type of pollution occurs on burning wood? (1 Mark)

(**Ans**) Air pollution.

(Q.) Name a liquid fuel which is used in homes. (1 Mark)

(**Ans**) Kerosene.

(Q.) Name the most common fire extinguisher. (1 Mark)

(**Ans**) Water is the most common water extinguisher.

(Q.) Which poisonous gas is produced due to incomplete combustion of a fuel? (1 Mark)

(**Ans**) When incomplete combustion of any fuel takes place, carbon monoxide gas is produced.

(Q.) Name the substance used to extinguish fire involving electrical equipments. (1 Mark)

(**Ans**) Carbon dioxide (CO_2).

(Q.) Why is food regarded as a fuel for our body? (2 Marks)

(**Ans**) In our body, food reacts with oxygen and is broken down into simpler food with the production of heat. This heat is used for carrying out various metabolic processes necessary for sustaining life. Hence,food is regarded as a fuel for our body.

(Q.) Write the full forms of-
(a) CNG
(b) LPG
(2 Marks)

(**Ans**) (a) CNG –Compressed Natural Gas
(b) LPG – Liquefied Petroleum Gas

(Q.) When a burning charcoal piece is covered with a glass jar, it stops burning. Why? (2 Marks)

(**Ans**) Whena burning charcoal piece is covered with a glass jar, the oxygen supply is cut off. Due to the absence of oxygen (air) inside the jar, the fire gets extinguished.

(Q.) Which will catch fire first coal or kerosene? (2 Marks)

(**Ans**) Kerosene will catch fire first because its ignition temperature is lower than coal.

(Q.) What are inflammable substances? (2 Marks)

(**Ans**) Those substances which have very low ignition temperature and can easily catch fire with a flame are known as **inflammable substances** e.g. petrol, LPG, etc.

(Q.) What would you do when the clothes of a person catches fire? (2 Marks)

(**Ans**) We would immediately cover the person with a blanket.This would prevent the entrance of air in the blanket. As a result, the fire would be extinguished (air is necessary for burning).

(Q.) Explain how water control fires? (2 Marks)

(**Ans**) Water cools the combustible material so that its temperature is brought below its ignition temperature. This prevents the fire from spreading. Moreover, water vapoursformed surround the combustible material. So, the supply of air is stopped and the fire is extinguished.

(Q.) How is CO_2 able to control fires? (2 Marks)

(**Ans**) CO_2 is heavier than oxygen. So, it covers the fire like a blanket. Since the contact between the fuel and oxygen is cut off, the fire is controlled and CO_2 does not harm the electrical equipment.

(Q.) What do you understand by Explosion? (2 Marks)

(**Ans**) The combustion in which a sudden reaction takes place with the evolution of heat, light, sound and gas is known as **explosion** e.g. ignition of a cracker.

(Q.) Which zone of a flame does a goldsmith use for melting gold and silver and why? (2 Marks)

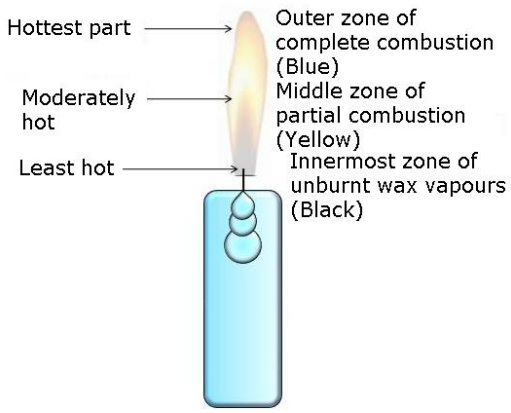
(**Ans**) A goldsmith uses outermost or non-luminous zone of a flame for melting gold and silver because this is the hottest part of the flame.

(Q.) How can water boil in a paper cup without burning it? (3 Marks)

(**Ans**) When we heat water in a paper cup then the heat supplied to the paper cup is transferred to water by conduction and the temperature of water goes on rising till it starts boiling. So, in the presence of water, the temperature of paper is not reached to its ignition temperature and the paper cup does not burn.

(Q.) What are the three zones of a flame ? Draw a labelled diagram of a candle flame. (3 Marks)

(**Ans**) The three zones of a flame are dark zone, luminous zone and non- luminous zone.
Different Zones of a Candle flame



(Q.) Why does the matchstick start burning on rubbing it on the side of the matchbox? (3 Marks)

(**Ans**) The rubbing surface of the matchbox contains powdered glass and a little red phosphorus. The head of the matchstick contains antimony trisulphide and potassium chlorate. When the matchstick is struck against the rubbing surface then some red phosphorus gets converted into white phosphorus which readily reacts with potassium chlorate of the head of the matchstick to produce sufficient heat to ignite antimony trisulphide. Thus, the matchstick starts burning.

(Q.) Give reasons-
(i) LPG is a better domestic fuel than wood.
(iii) Water is not used to control fires involving electrical equipment.

(3 Marks)

(**Ans**) **(i)** 1. LPG (55000 kJ/kg) has higher calorific value than wood (17000-22000 kJ/kg).
2. LPG does not give smoke and any harmful gases but wood gives smoke and harmful gases like CO on burning.
Hence,LPG is a better domestic fuel than wood.
(ii) Water is not used to control fires involving electrical equipment because water may conduct electricity and harm those trying to extinguish the fire.

(Q.) Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not.

(3 Marks)

(**Ans**) When a piece of paper wrapped around an aluminium pipe is heated than the heat is rapidly transferred to the aluminium pipe because Al is a good conductor of heat. So, the temperature of the paper does not reach its ignition temperature and it does not catch fire.

But, in case of heating the paper itself, the ignition temperature of the paper reaches readily and the paper catches fire.

(Q.) Define-
a. Spontaneous combustion.
b. Rapid combustion.

(3 Marks)

(**Ans**) **a. Spontaneous combustion-**The combustion in which a material suddenly bursts into flames without any visible cause is known as spontaneous combustion e.g. spontaneous fires of forests occur due to the heat of the sun or due to lightning strike.
b. Rapid combustion- The combustion in which a material burns rapidly and produces heat and light is called as **r**apid combustion e.g. phosphorus burns in air readily at room temperature.

(Q.) (i) What is calorific value? Write its unit.
(ii) In an experiment 4.5 kg of a fuel was completely burnt. The heat produced was measured to be 180,000 kJ. Calculate the calorific value of the fuel.

(3 Marks)

(**Ans**) **Calorific value** of a fuel is the amount of heat energy evolved on complete combustion of 1 kg of a fuel. Its unit is **kilojoule per kg** (kJ/kg).
(ii) The heat produced by burning 4.5 kg of a fuel =180,000 kJ
The heat produced by burning 1 kg of a fuel =180,000 kJ /4.5 kg
=40,000 kJ/kg
So, the calorific value of the fuel=40,000 kJ/kg

(Q.) Why is it difficult to burn a heap of green leaves but dry leaves catch fire easily? (3 Marks)

(**Ans**) For the combustion, the substance must be heated to its ignition temperature. If the ignition temperature is not reached then the combustion does not start. Green leaves contain moisture which increases their ignition temperature. Hence, it is difficult to burn a heap of green leaves. The ignition temperature of dry leaves is low. So, they catch fire easily.