

1. List conditions under which combustion can take place.

Sol. Conditions under which combustion can take place are as follows:

- (a) Air
- (b) The ignition temperature
- (c) Inflammable substance.

2. Fill in the blanks:

- (a) Burning of wood and coal causes _____ of air.
- (b) A liquid fuel, used in homes is _____.
- (c) Fuel must be heated to its _____ before it starts burning.
- (d) Fire produced by oil cannot be controlled by _____.

Sol. (a) pollution (b) LPG
(c) ignition temperature (d) water

3. Explain how the use of CNG in automobiles has reduced pollution in our cities.

Sol. The use of CNG in automobiles has reduced pollution in our cities because CNG does not produce any poisonous gas on burning. That is why pollution in our cities is reduced.

4. Compare LPG and wood as fuels.

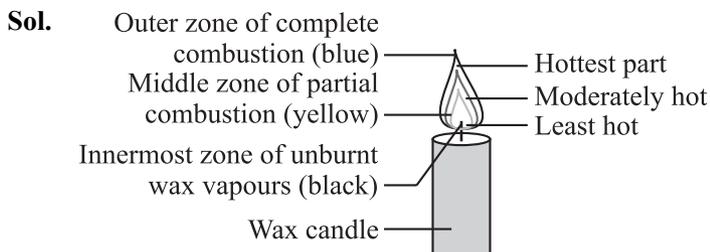
Sol. LPG burns easily and produces more heat in comparison to wood. Besides, it is a clean fuel, it does not produce fume and ashes as wood do. LPG can be stored and transported easily and conveniently.

5. Give reasons:

- (a) Water is not used to control fires involving electrical equipment.
- (b) LPG is a better domestic fuel than wood.
- (c) Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not.

Sol. (a) Water is not used to control fire produced by electrical equipment because water is conductor of electricity and may result in electric shock.
(b) LPG is a substance which is readily available. It is cheaper and burns easily in air at moderate rate. It produces large amount of heat and does not leave behind any undesirable substance.
(c) Paper catches fire easily, but when it is wrapped around an aluminium pipe, the ignition temperature does not meet as heat is transferred to aluminium to lower the temperature of paper.

6. Make a labelled diagram of a candle flame.



7. Name the unit in which the calorific value of a fuel is expressed.

Sol. The calorific value of a fuel is expressed in kilojoules per kg (kJ/kg).

8. Explain how CO_2 is able to control fires.

Sol. Carbon dioxide being heavier than oxygen covers the fire like a blanket. Since the contact between fuel and oxygen is cut off, the fire is controlled. The added advantage of carbon dioxide is that in most cases it does not harm the electrical appliances.

9. It is difficult to burn a heap of green leaves but dry leaves catch fire easily. Explain.

Sol. Green leaves contain lot of water. So, when we try to burn green leaves, water contained in the leaves cools the combustible materials, so that its temperature is brought below its ignition temperature. This prevents the burning of green leaves. In case of dry leaves, water is absent in them so burning process start as the temperature is raised above the ignition temperature and the leaves catch fire easily.

10. Which zone of a flame does a goldsmith use for melting gold and silver and why?

Sol. The goldsmith uses the outermost zone of a flame with a metallic blow pipe for melting gold and silver.

The flame in outermost zone has the highest temperature sufficient to melt the gold and silver.

11. 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.

Sol. Calorific value of a fuel = Total heat produced/Total mass burnt.

Here, mass of fuel = 4.5 kg.

Heat produced = 180,000 kJ.

Therefore, calorific value of fuel = $180,000/4.5\text{kg} = 40,000 \text{ kJ/kg}$.

12. Can the process of rusting be called combustion? Discuss.
- Sol.** Yes, process of rusting can be called combustion, in fact, slow combustion, because rusting also takes place in the air in presence of humidity in the atmosphere.
13. Abida and Ramesh were doing an experiment in which water was to be heated in a beaker. Abida kept the beaker near the wick in the yellow part of the candle flame. Ramesh kept the beaker in the outermost part of the flame. Whose water will get heated in a shorter time?
- Sol.** The water of Ramesh's beaker will get heated in a shorter time because the outermost part of the flame is the hottest.

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