



For question numbers 8-10, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below -

i) Both A and R are true and R is correct explanation of the assertion.

ii) Both A and R are true but R is not the correct explanation of the assertion.

iii) A is true but R is false.

iv) A is false but R is true

8. Assertion: Substances that burn in air are called combustible substances

Reason: Substances that do not burn in air are called non-combustible substances

**ii) Both A and R are true but R is not the correct explanation of the assertion.**

9. Assertion: A non-luminous flame is accompanied with heat but very little light.

Reason: A blue flame is produced due to incomplete combustion

**iii) A is true but R is false.**

10. Assertion: The inner zone of candle flame is black in colour.

Reason: The inner zone lacks oxygen, hence no combustion occurs here

**i) Both A and R are true and R is correct explanation of the assertion.**

## **II. BASIC CONCEPT LEVEL:**

1. Name two fuels used at home. (Wood, LPG, Coal, Kerosene)

2. Name some highly inflammable substances. (Petrol, Alcohol, LPG)

3. An example of combustible substances that shows rapid combustion. (LPG)

4. Name the clean fuel recommended to use in buses. (CNG)

5. Crackers on ignition produces sound. Why? (Hint- Cracker on ignition produces sound due to the sudden formation of large amount of gas due to chemical reactions. The gases expand and explode. Such a combustion is called explosion.)

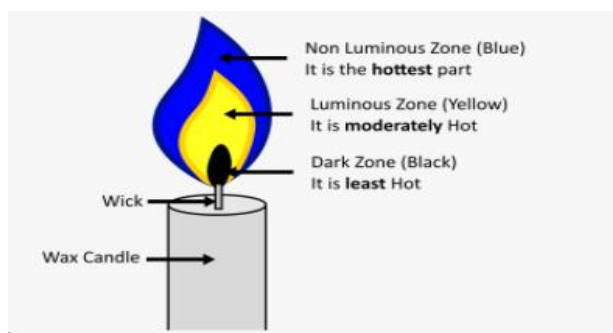
6. Kerosene oil produces flame whereas coal does not produce flame. Comment on the statement. (Hint- Kerosene oil-vapourises, Coal- Does not vapourise)

### III .INTERMEDIATE LEVEL:

- 1.What do you understand by the term ignition temperature? (Hint: The lowest temperature at which a substance catches fire)
2. When the clothes of a person catches fire, the person is covered with a blanket to extinguish fire. Explain why? (Hint- Blanket cuts the oxygen supply)
3. What are the characteristics of good fuel? (Hint: Should have high calorific value, Low ignition temperature, Moderate rate of combustion, Cheap and easily available, Safe to handle, store and easy to transport, should not cause pollution on burning)
- 4.State the difference between rapid and spontaneous combustion. (**rapid combustion-** When a substance burns **in a** short span of time. The type of combustion in which a material suddenly bursts into flames, without the application of any apparent cause is called **spontaneous combustion.**)
- 5.What is flame? (Hint- Region where combustion takes place)
- 6.Although wood has a very high calorific value, we still discourage it as a fuel. Why? (Hint- Burning of wood produces a lot of smoke which causes respiratory diseases, deforestation, trees provide us many useful substances.)
- 7.What is explosion? (Hint: The sudden reaction occurring with evolution of heat, light and sound when crackers are burnt)
- 8.What do understand from the statement – calorific value of candle wax is 5000kJ/kg? (Hint: The amount of heat liberated when 1 kg of wax is completely burnt in the presence of air is 5000kJ/kg)
- 9.Why do you have to use paper or kerosene oil to ignite fire in wood or coal? (Hint-The ignition temperature of paper and kerosene oil is low. When paper or kerosene oil catches fire it causes the wood or coal to attain its ignition temperature so that they also catch fire.)
- 10.Introduce a glass plate into the luminous zone of the steady candle flame and hold it for few seconds, then remove it. What did you observe on the glass plate? (Hint- blackish ring, due to the deposition of unburnt carbon particles)
- 11.The calorific values of petrol and CNG are 45,000 and 50,000kJ/kg respectively. If you have a vehicle which can run on both petrol as well as CNG, which will you prefer and why? (Hint- the calorific value of CNG is higher than that of petrol. Produces large amount of heat energy than petrol. It produces the least air pollutants.)
12. In an experiment 4kg of fuel was completely burnt. The heat produced was measured to be 160,000kJ. Calculate the calorific value of the fuel. (Hint-amount of heat energy produced/weight of the fuel burnt-40,000kJ/kg)

### IV. ADVANCED LEVEL:

1. Explain the term fuel efficiency. (Hint: The amount of heat produced by the complete combustion of unit mass of a **fuel** is known as **fuel efficiency** or calorific value.)
- 2.Draw a neat labelled diagram showing the different zones of a candle flame.



3. Why carbon dioxide fire extinguisher is considered as an excellent fire extinguisher? (Hint- Carbon dioxide being heavier than oxygen forms a blanket and cuts off oxygen supply, it brings down the temperature of the fuel, it does not harm the electrical equipment)

4.a) Name the outermost zone of a candle flame. What colour is it? Why?

(Hint-Nonluminous zone, blue, complete combustion takes place due to availability of oxygen)

b) What is the moderately hot zone yellow in colour? (Hint-Luminous zone, unburnt carbon particles glow)

c) Why is the zone that is closest to the wick black? (Hint-Innermost zone accumulation of wax vapours as it is an area of no combustion)

d) How does throwing sand on fire help to put it off?

(Hint- sand cuts off the oxygen supply and thus the fire goes off)

5. State the conditions necessary for combustion to take place. (Hint: Substance must be combustible, medium like oxygen should be available, substance must attain its ignition temperature)

6. Give Reason-Water is not used to control fires involving electrical equipment. (Hint: Water is a good conductor of electricity. If added to an electrical fire, the water would just spread the electricity further. The person dousing the fire might get an electric shock)

8. Write a short note on the phenomenon of Global Warming. (Global warming is the rise in temperature of the atmosphere of the earth. This result, among other things, in the melting of polar glaciers, which leads to a rise in the sea level, causing floods in the coastal areas. Low lying coastal areas may even be permanently submerged under water.)

### V. EXEMPLAR QUESTIONS

1. Manu was heating oil to fry potato chips. The vessel with oil all of a sudden caught fire. He poured water to extinguish fire. Do you think this activity was suitable? Why?

Ans: Pouring water to extinguish fire caused due to oil is not correct. Oil is lighter than water, hence it floats on water. To cut off the supply of air, a lid can be placed on the pan.

2. You are provided with three watch glasses containing milk, petrol and mustard oil respectively. If a burning candle is brought near these materials, which one will catch fire instantly, Why?

Ans: The watch glass containing petrol catches fire instantly as its ignition temperature is low. Petrol is an inflammable substance.