

SCIENCE
WORKSHEET_221125
CHAPTER 04 COMBUSTION AND FLAME

SUBJECT: SCIENCE
CLASS : VIII

MAX. MARKS : 40
DURATION : 1½ hr

SECTION – A

Questions 1 to 6 carry 1 mark each.

- 1.** Choose the correct statement about inflammable substance from the following :

They have :

- (a) low ignition temperature and can catch fire easily
- (b) high ignition temperature and can catch fire easily
- (c) low ignition temperature and cannot catch fire easily
- (d) high ignition temperature and cannot catch fire easily

Ans. (a) low ignition temperature and can catch fire easily

Inflammable substances are those substances which have low ignition temperature and can catch fire easily.

- 2.** Magnesium ribbon on burning in air produces :

- (a) magnesium oxide, water and light
- (b) magnesium oxide, and heat
- (c) magnesium oxide, heat and light
- (d) magnesium oxide, water and heat

Ans. (c) magnesium oxide, heat and light

Magnesium burns to form magnesium oxide and produces heat and light. Magnesium ribbon is a very reactive metal.

- 3.** The substance expected to have the highest ignition temperature out of the following is:

- (a) kerosene
- (b) petrol
- (c) coal
- (d) alcohol

Ans. (c) coal

Ignition temperature is the lowest temperature at which the substance catches fire. Coal has the highest ignition temperature.

- 4.** The calorific value of a fuel is expressed in a unit called

- (a) kilojoule per litre
- (b) kilogram per milliliter
- (c) kilojoule per gram
- (d) kilojoule per kilogram

Ans. (d) kilojoule per kilogram

The unit of calorific value of a fuel is expressed kilojoule per kilogram (kJ/kg).

- 5.** Shyam was cooking potato curry on a chulha. To his surprise he observed that the copper vessel was getting blackened from outside. It may be due to :

- (a) proper combustion of fuel
- (b) improper cooking of potato curry.
- (c) improper combustion of the fuel
- (d) burning of copper vessel.

Ans. (c) improper combustion of the fuel

Copper vessel was getting blackened from outside due to incomplete combustion of fuel. When the flame in the gas stove is blue, the fuel is burns completely and the bottom of the utensil remains clean. If The fuel does not burn completely then a sooty flame is produced and blackens the utensil.

- 6.** In the below question, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as

Assertion (A): Water is commonly used to control fire.

Reason (R): Any fire can be extinguished with water.

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

Ans: (c) Assertion (A) is true but reason (R) is false.

The most common fire extinguisher is water. The Fire brigade pours water on the fire. Water cools the combustible material so that its temperature is brought below its ignition temperature. This prevents the fire from spreading. But water works only when things like wood and paper are on fire. If electrical equipment is on fire, water may conduct electricity and harm those trying to extinguish the fire. Water is also not suitable for fires involving oil and petrol. This is because as water is heavier than oil, it sinks below the oil and oil keeps burning on top.

SECTION – B

Questions 7 to 9 carry 2 marks each.

7. What are combustible and noncombustible substances? Explain with examples.

Ans. The substances in which combustion takes place are called combustible substances. For example: wood, paper, coal.

The substances in which no combustion takes place are called noncombustible substances. For example: Glass, iron nail.

8. Explain how CO₂ is able to control fires.

Ans. Actually, CO₂ cuts off supply of air to the combustible substance or it brings down the temperature of the combustible substance below its ignition temperature by forming a layer on that substance due to which it stops the fire.

9. Can the process of rusting be called combustion? Discuss.

Ans. Rusting is the process in which metal reacts with oxygen of air and moisture of air and forms its oxides, which appear on the surface of that metal. While combustion is the process of burning of combustible substance in the presence of oxygen of air. So, we cannot call the rusting as combustion.

SECTION – C

Questions 10 to 13 carry 3 marks each.

10. 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.

Ans. (a) Water is a good conductor of electricity. It conducts electricity and may result electric shock.

(b) LPG has more calorific value and produces no pollution. So it is better domestic fuel than wood.

(c) The ignition temperature of paper is less, so it catches fire easily. It does not catch fire when wrapped around aluminium pipe because aluminium absorbs the heat, so paper does not attain its ignition temperature.

- 11.** Why is the colour of outer zone is blue while middle zone is yellow coloured?
Ans. Outermost zone: It is blue coloured part because complete combustion takes place in this part due to sufficient amount of oxygen. It is the hottest part of the flame.
Middle Zone: The colour of the middle zone is yellow because incomplete combustion takes place in this part for the lack of oxygen. It is less hot part than outer part of the flame.
- 12.** Although wood has a very high calorific value, we still discourage its use as a fuel. Explain.
Ans. Burning of wood has several disadvantages. These are as follows :
(i) Burning of wood produces a lot of smoke which causes respiratory diseases.
(ii) The cutting down of trees to obtain wood fuel leads to deforestation which is very harmful to the environment.
(iii) Trees provide us many useful substances. To obtain fuel wood, when trees are cut down, then all useful substances which can be obtained from trees are lost.
- 13.** Forest fire produces a lot of air pollution. Write in brief about the reasons of forest fires.
Ans. Reasons of forest fires:
(i) At high temperature, sometimes dry grass catches fire which spreads throughout the forest.
(ii) Camp fire may also be a reason.
(iii) Lightning.
(iv) The use of fires by villagers toward off wild animals.
(v) Fire started accidentally by careless visitors.
(vi) The friction of bamboos due to high wind velocity and rolling stones.

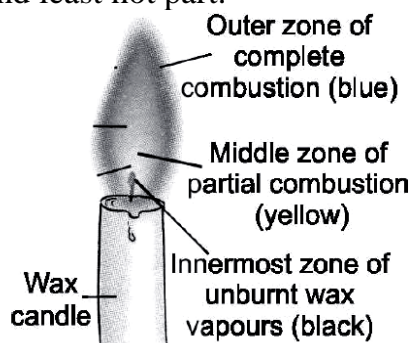
SECTION – D

Questions 14 to 16 carry 4 marks each.

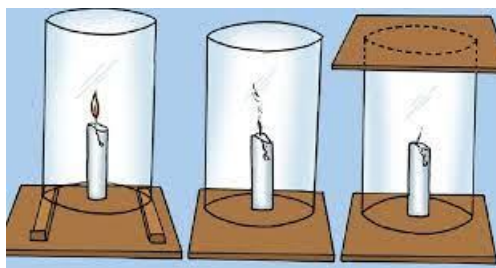
- 14.** Explain the structure of a flame with the help of diagram.

Ans. There are following three parts of a flame:

- (i) Outer zone: It is non-luminous and the hottest zone.
- (ii) Middle zone: It is less hot and yellow coloured zone.
- (iii) Inner zone: It is dark zone and least hot part.



- 15.** What are the essential conditions for combustion? Explain with the help of an activity.
Ans. Take a candle. Light it and fix it on a table. Put a glass chimney over the candle and rest it on wooden blocks in such a way that air can enter the chimney. We see that candle remains lighted. Remove the blocks and let the chimney rest on the table. We see that the flame flickers and produces smoke. Now put a glass plate over the chimney. We see that flame goes off because air is not available.
This activity shows that air is essential to burn a fuel at its ignition temperature.



16. What are three essential requirements to produce fire? How are fire extinguishers useful for controlling the fire?

Ans. Three essential requirements to produce fire are as follows :

- (i) Fuel
- (ii) Air
- (iii) Heat to acquire the ignition temperature.

The fire extinguishers cut off the supply of air or bring down the temperature of fuel or both. For fires involving electrical equipment and inflammable materials like petrol, carbon dioxide (CO₂) is the best extinguisher. CO₂ being heavier than oxygen, covers the fire. Since, the contact between the fuel and oxygen is cut-off, the fire can be controlled. The added advantage of CO₂ is that in most cases, it does not harm the electrical equipments.

SECTION – E (Case Study Based Question)

Question 17 carry 4 mark

17. Wood as domestic and industrial fuel has been replaced by coal and other fuels like LPG. Moreover, cutting of trees leads to deforestation. Carbon fuels like wood, coal, petroleum release unburnt carbon particles. These fine particles are dangerous pollutants causing respiratory diseases, such as asthma. Incomplete combustion of these fuels gives carbon monoxide gas. The carbon monoxide gas produced can kill persons sleeping in that room.



Combustion of most fuels releases carbon dioxide in the environment. Increased concentration of carbon dioxide in the air is believed to cause global warming. Burning of coal and diesel releases sulphur dioxide gas. It is an extremely suffocating and corrosive gas. Moreover, petrol engines give off gaseous oxides of nitrogen. Oxides of sulphur and nitrogen dissolve in rain water form acids. Such rain is called acid rain. It is very harmful for crops, buildings and soil. The use of diesel and petrol as fuels in automobiles is being replaced by CNG, because it is a cleaner fuel.

- (i) (a) What is LPG stands for?
- (b) What is CNG stands for?
- (ii) What is Global Warming?
- (iii)(a) Why burning of coal is considered dangerous in a closed room?
- (b) What is acid rain?

OR

What is deforestation and what are the harmful effects on environment?

Ans. (i) (a) LPG stands for Liquefied Petroleum Gas.

(b) CNG stands for Compressed Natural Gas.

(ii) Global warming is the rise in temperature of the environment of the earth because of the excessive concentration of carbon dioxide released on the combustion of more fuels.

(iii) (a) Burning of coal is considered dangerous as coal releases unburnt carbon particles which are dangerous pollutants causing respiratory disease such as asthma. Incomplete combustion of coal gives poisonous carbon monoxide gas which can kill persons sleeping in the closed room.

(b) Burning of coal and diesel releases Sulphur dioxide gas which is extremely suffocating and corrosive. Moreover, petrol engines give off gaseous oxides of nitrogen. These oxides of Sulphur and Nitrogen dissolve in rain water form acids. When they come on earth in the form of rain, it is called acid rain. It is harmful for crops, buildings and soil.

OR

Deforestation is just opposite to forestation. Deforestation is clearing of forests and using that land for other purposes. Cutting of trees leads to harmful effects on environment such as soil erosion and barren lands, lack of rain, lack of vegetation