Combustion and Flame

Very Short Answer Type Questions

Question 1.
Define ignition temperature of a substance.
Answer:
Ignition temperature is the lowest temperature at which a substance catches fire. Ignition temperature is different for different substances. For example; LPG, petrol, natural gas, etc. catch fire at very low temperature and thus have low ignition temperature, while wood, coal, etc. have high ignition temperature.

Question 2.
Which of the two has a lower ignition temperature: petrol or kerosene?
Answer:
Petrol has a lower ignition temperature. Kerosene molecules are larger than petrol molecules and hence don't mix easily with oxygen present in air. Thus, it has higher ignition temperature than petrol.

Question 3.
Name the most common fire extinguisher.
Answer:
There are mainly five types of fire extinguisher – Water, Foam, Dry Powder, CO_2 and Wet Chemical. Water is one of the best, cheapest and most common fire extinguishers.

1. Water fire extinguisher
2. Foam fire extinguisher
3. Dry Powder fire extinguisher
4. CO_2 fire extinguisher and,
5. Wet Chemical fire extinguisher.Water is one of the best, cheapest and most common fire extinguishers.
   Out of all these, the Water fire extinguisher is one of the best, cheapest and most common fire extinguishers.

Question 4.
Which is the best fire extinguisher for fires involving electrical equipment and inflammable materials like petrol?
Answer:
Carbon dioxide does not support combustion and hence is considered as the best fire extinguisher for fires involving electrical equipment and inflammable materials like petrol.

Question 5.
Name one substance which undergoes spontaneous combustion(or burns in air at room temperature).
Answer:
When white phosphorus is left out open in the room temperature for sometime, it burns all by itself.

Question 6.
Name the unit in which the calorific value is expressed.
Answer:
It is measured in units of energy per unit of the mass of the substance, such as: kJ/kg, J/Kg.

Question 7.
Which of the following fuels has the lowest calorific value?
Answer:
Coal has the lowest calorific value. Coal contains moisture. When coal burns the moisture in coal evaporates taking away some heat of combustion which is not available for our use.

Question 8.
Which of the following fuels has the highest calorific value?
Diesel, Methane, CNG, Coal, Petrol
Answer:
CNG and methane have the highest calorific value. Both of them have calorific value of 50000 KJ/Kg.

Question 9.
Name the term which is used to express the efficiency of a fuel.
Answer:
Calorific Value is the term which is used to express the efficiency of a fuel.

Question 10.
Name one solid, one liquid and one gas which burn by producing a flame.
Answer:
Molten wax(Solid), Kerosene oil(Liquid) and LPG(gas) are the substances which burn by producing flames.

Question 11.
Which of the following does not produces a flame on burning?
Answer:
Charcoal does not vaporize and so does not produce a flame.

Question 12.
Name one fuel which burn without producing a flame.
Answer:
Charcoal does not vaporize and so does not produce a flame.

Question 13.
How many Zones are there in a flame?
Answer:
A flame consist of three zones. These are Innermost zone, middle zone, outer zone. The three zones of a flame have different colors and different temperature.

Question 14.
Which zone of a candle flame is the hottest?

Answer:
The outermost zone has the highest temperature in the flame. It is the hottest part of the flame. It is quite thin as compared to middle zone.

Question 15.
In a candle flame, what is the colour of: (a) innermost zone (b) middle zoneand (c) outer zone?
Answer:
(a) innermost zone- The Innermost zone of a flame is dark or black
(b) middle zone- The middle zone of a flame is yellow
(c) outer zone- The outer zone of a flame is blue. It is a non-luminous zone

Question 16.
Name any harmful product released by the burning of fuels.
Answer:
Incomplete combustion of fuels produces a very poisonous gas called carbon monoxide.

Question 17.
Name the very poisonous gas produced by the incomplete combustion of fuels.
Answer:
Incomplete combustion of fuels produces a very poisonous gas called carbon monoxide.

Question 18.
Name the fuel which is gradually replacing petrol and diesel in automobiles.
Answer:
The use of diesel and petrol as fuels in automobiles is being replaced by CNG (Compressed Natural Gas), because CNG produces the harmful products in very small amounts. CNG is a cleaner fuel.

Question 19.
Name two substance having low ignition temperature and two having high ignition temperatures.
Answer:
LPG and petrol catch fire at very low temperature and thus have low ignition temperature, while wood and coal have high ignition temperature.

Question 20.
Fill in the blanks with suitable words:
(a) A fuel must be heated to its…… before it starts burning.
(b)The most common supporter of combustion around us is……..
(c)Fire produced by burning oil cannot be controlled by……
(d)A liquid fuel used in homes is……
(e)The amount of heat evolved when 1kg of a fuel is burnt completely is called its……..
(f)The substance which vaporize during, give……..
(g)Burning of wood and coal causes……. of air.
Answer:
(a) ignition temperature
(b) air
(c) water
(d) kerosene
(e) calorific value

(f) flames
(g) pollution

Short Answer Type Questions

Question 21 A.
What are fuels? Name any two common fuel.
Answer:
A fuel is a very good source of heat. The heat energy produced by burning a fuel can be used directly to cook food, for running motor vehicles and factory machines, can be converted into electrical energy at thermal power stations. Wood and Petrol are examples of two common fuels.

Question 21 B.
State any four characteristic of an ideal fuel(or good fuel).
Answer:
Characteristics of ideal fuel-

1. It has a high calorific value
2. It burns easily in air at a moderate rate
3. It has proper ignition temperature
4. It does not produce any harmful gases or leaves any residue after burning.

Question 22 A.
Define the calorific value of a fuel.
Answer:
The amount of heat produced by the complete burning or combustion of 1 Kilo gram of a fuel is called its calorific value. The calorific value of a fuel is expressed in the unit of Kilo joules per kilogram.

Question 22 B.
“The calorific value of LPG is 55000 KJ/kg”. What does it mean?
Answer:
The calorific value of LPG is 55000 KJ/Kg. It means when 1 Kg of LPG is burned completely, then 55000 KJ of heat energy is produced.

Question 23.
Can you burn a piece of wood by bringing a lighted matchstick near it? Explain.
Answer:
A matchstick can light a tiny splinter of wood but not a big log of wood. A splinter of wood has a low ignition temperature. A burning matchstick can produce sufficient heat to reach the ignition temperature of the splinter of wood therefore a matchstick can light a splinter of wood directly.

Question 24.
Why do you have to use paper or kerosene oil to start fire in wood or coal?
Answer:
The ignition temperature of wood or coal is very high, as it requires too much of time to get heated before burning. We use paper or kerosene to start fire because they have low ignition temperature

which helps to catch fire immediately and helps the wood or the coal to reach its required ignition temperature.

Question 25.
What is meant by rapid combustion? Give one example of rapid combustion.
Answer:
Rapid combustion is the combustion in which a substance burns rapidly with the help of an external source and produces heat within a very short time. Eg:- Burning of LPG.

Question 26.
What is meant spontaneous combustion? Give one example of spontaneous combustion.
Answer:
Spontaneous combustion is the combustion in which a substance burns spontaneously and produces heat and light without the help of external source of heat. Eg:- phosphorus burns spontaneously at room temperature.

Question 27.
What is meant by explosive combustion (or explosion)? Give one example of explosive combustion (or explosion).
Answer:
Explosive combustion is the combustion in which a substance burns suddenly and produces heat, light and sound with the help of external source of heat or pressure. Eg:- explosion of crackers on applying heat or pressure.

Question 28.
How will you show that air is necessary of combustion?
Answer:
Oxygen helps in combustion. Air contains about 29% of oxygen, thus supply of air makes the oxygen available which helps in combustion. Without oxygen, combustion will not take place.

Question 29.
Can the process of rusting be called combustion? Give reason for your Answer:.
Answer:
Combustion is a chemical process in which a substance reacts with oxygen and gives out energy during the process in the form of either heat or light or both. Rusting of iron is an exothermic process as heat is released during rusting. Hence, it is a kind of slow combustion.

Question 30.
Why are fires produced by burning oil not extinguished by pouring water?
Answer:
As water is heavier than petrol therefore slips down permitting the petrol to rise to the surface and continue to burn. Besides, the existing temperature is so high that the water poured on the fire evaporates even before it can extinguisher the fire.

Question 31.
Explain why, fire caused by electricity should not be extinguished by pouring water.
Answer:

Water is conductive in nature and hence the electricity in the equipment could reach the extinguisher (the person dousing the fire using water) and can electrocute him/her.

Question 32.
How is the fire caused by electricity extinguished?
Answer:
To put an electrical fire out, we need to unplug or de-energise the equipment on fire. That will eliminate the electricity that is causing the fire. If one cannot unplug what is burning there is a special type of fire extinguisher.

Question 33.
How is the fire produced by burning oil (or petrol) extinguished?
Answer:
Carbon dioxide is the best fire extinguisher to put out fire caused by inflammable materials like oil and petrol and electrical equipments. Carbon dioxide is heavier than air and it covers the fire and cuts off the supply of oxygen and puts out the fire. Carbon dioxide is stored at high pressure as liquid in cylinders.

Question 34.
A drum full of kerosene catches fire. What is the simplest way to put off this fire?
Answer:
A small fire like a drum of kerosene on fire can be extinguished by throwing sand or soil over it. When sand is thrown over burning kerosene oil, the sand covers it like blanket. The sand cuts off the air supply to the burning kerosene oil due to which the fire gets extinguished.

Question 35.
What is the first thing you should do if a fire caused by burning wood or paper.
Answer:
Water extinguishes heat by cooling down the burning substance such as wood and paper. When water is thrown on these substances, it gets cooled below its ignition temperature and also stops burning. The water vapour produced by the action of heat of fire on water surround the burning material and help in cutting off the supply of air.

Question 36 A.
What does a Fire Brigade do when it arrives at a place where a building is on fire.
Answer:
When fire brigade arrives to the rescue, the fire man throws a strong stream of water on the building on fire, the burning material get cooled down to below their ignition temperature and fire is extinguished. The water vapour produced by the action of heat of fire on water surround the burning material and help in cutting off the supply of air. Fire-men extinguishes the fire by throwing water under pressure on the burning things.

Question 36 B.
Describe one method of putting out a fire caused by burning wood or paper.
Answer:
Water extinguishes heat by cooling down the burning substance such as wood and paper. When water is thrown on these substances, it gets cooled below its ignition temperature and also stops

burning. . The water vapour produced by the action of heat of fire on water surround the burning material and help in cutting off the supply of air.

Question 37.
Explain why, we are advised not to sleep in a room having closed doors and windows, with a coal fire burning inside.
Answer:
Due to the burning of coal, the available oxygen gets depleted and it leads to incomplete burning of coal. Incomplete combustion of coal gives carbon monoxide gas. It is a very poisonous gas. It is dangerous to burn coal in a closed room. The carbon monoxide gas produced can kill persons sleeping in that closed room

Question 38 A.
What is a flame? What type of substance ,on burning, give a flame?
Answer:
Flame is the zone of combustion of a combustible substance. Substances which vapourise during burning produce flames. Eg:- kerosene, wax etc.

Question 38 B.
What is the difference between the burning of a candle and the burning of a fuel like coal.
Answer:
Substances which vapourise during burning, produce flames, such as wax in the candle, Kerosene. Substances which do not vapourise during burning, do not produce flames. Example- coal and charcoal.

Question 39.
How does pouring water extinguished a fire.
Answer:
Water extinguishes heat by cooling down the burning substance. When water is thrown on substances, it gets cooled below its ignition temperature and also stops burning. The water vapour produced by the action of heat of fire on water surround the burning material and help in cutting off the supply of air.

Question 40.
Explain how, carbon dioxide is able to control fires?
Answer:
Carbon dioxide is the best fire extinguisher to put out fire caused by inflammable materials like oil and petrol and electrical equipments. Carbon dioxide is heavier than air and it covers the fire and cuts off the supply of oxygen and puts out the fire. Carbon dioxide is stored at high pressure as liquid in cylinders. When released from the cylinder, carbon dioxide expands enormously in volume and cools down. Carbon dioxide not only forms a blanket around the burning substance, it also cools down the burning substance.

Question 41.
If you see a person whose clothes are on fire, how will you extinguish the fire? Give reason for your Answer:.
Answer:
If the clothes of a person catch fire, the person should be immediately covered with a blanket. When

the burning clothes of a person are covered with a blanket, the supply of air to the burning clothes is cut off and hence the burning stops.

Question 42.
Give two examples each of:
(a) solid fuels
(b) liquid fuels
(c) gaseous fuels
Answer:
a) Solid Fuels: Wood, charcoal, coal, coke, cow-dung cakes.
b) Liquid Fuels: Kerosene, petrol, diesel, alcohol.
c) Gaseous fuels: Coal gas, natural gas

Question 43.
Name the various zones of a candle flame. Which zone(or part) of a candle flame is the least hot(or coldest)?
Answer:
A candle flame has three main zones. They are:-

1. Outer zone
2. Middle zone
3. Inner zone

In the inner zone there are no burnt vapours of the fuel due to which the colour is black and is least hot(or coldest) part.

Question 44.
Why does a goldsmith blow air into the kerosene lamp flame with a blow-pipe?
Answer:
A goldsmith blows air into the kerosene lamp flame with a blow pipe so that complete combustion of fuel takes place and the temperature of the flame increases. He blow the outermost zone of a flame with a metallic blow pipe for melting gold and silver because this is the hottest part of the flame.

Question 45.
In which zone of a candle flame:
(a) partial combustion of fuel takes places, and
(b) complete combustion of fuel takes place?
Answer:
(a) In the middle zone partial combustion of the fuel takes place, so the colour of the flame is yellow and it is moderately hot part of the flame. It is the luminous part of the flame.
(b) In the outer zone complete combustion of the fuel takes place, so colour of the flame is blue and it is the hottest part of the flame. It is the non luminous part of the flame.

Question 46.
Explain how, the use of CNG in automobiles has reduced pollution in cities.
Answer:
The use of petrol and diesel as fuels in automobiles is being replaced by CNG because

1. It produces very small amount of harmful gases.
2. It burns without smoke so it is a clean fuel.

Question 47.
What are the disadvantage of burning wood as fuel?
Answer:
Disadvantages of burning wood as fuel are as follow:

1. Burning of wood produces a lot of smoke which is very harmful for human being. It causes respiratory diseases such as bronchitis and asthma.
2. When trees are cut down to obtain wood for use as fuel, then all the useful substances which are obtained from trees are lost.
3. Deforestation is very harmful for environment.

Question 48.
Give reason for the following:
LPG is a better domestic fuel than wood.
Answer:
LPG is a better domestic fuel than wood due to:

1. LPG has higher calorific value, so it produces much more heat on burning than an equal mass of wood.
2. It burns without leaving behind any smoke.
3. It burns completely without leaving behind any solid residue but wood leaves behind a lot of ash on burning.

Question 49.
Explain why, when a burning candle is covered with an inverted gas jar ,the candle gets extinguished after sometime.
Answer:
When a burning candle is covered with an inverted gas jar, the oxygen supply gets cut-off. Oxygen is necessary for combustion to take place. It is a supporter of combustion. Hence the candle gets extinguished after sometime.

Question 50.
It is difficult to burn a heap of green leaves but dry leaves catch fire easily. Explain.
Answer:
It is difficult to burn a heap of green leaves but dry leaves catch fire easily. The green leaves contain a lot of water. This water does not allow the green leaves to get heated to their ignition temperature and makes burning of green leaves difficult. Dry leaves do not contain water, they get heated to their ignition temperature easily and hence catches fire easily.

Long Answer Type Questions

Question 51 A.
What are combustible substances? Name three combustible substances.
Answer:

Those substances which can burn are called combustible substances. For Ex: Cloth, straw, cooking gas, kerosene oil, wood, coal, charcoal etc. A combustible substance is called as fuel

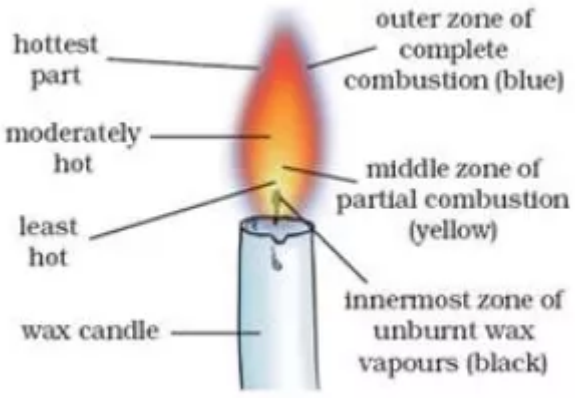
Question 51 B.
What are non-combustible substance? Name three non-combustible substances.
Answer:
Those substances which do not burn are called non-combustible substances. For Ex: Stone, cement, glass, bricks, soil, sand, water, iron nails, copper objects.

Question 52 A.
What is meant by 'combustion'? Explain with an example.
Answer:
A chemical process in which a substance reacts with the oxygen to give heat and light is called combustion. The light which is given off during combustion can be in the form of flame or as a glow. The substance which undergoes combustion is said to be combustible. It is called fuel.

Question 52 B.
What are the conditions necessary for combustion to take place.
Answer:
There are three conditions which are necessary for combustion to take place:

1. Presence of combustible substance.
2. Presence of supporter of combustion.
3. Heating the combustible substance to its ignition temperature.

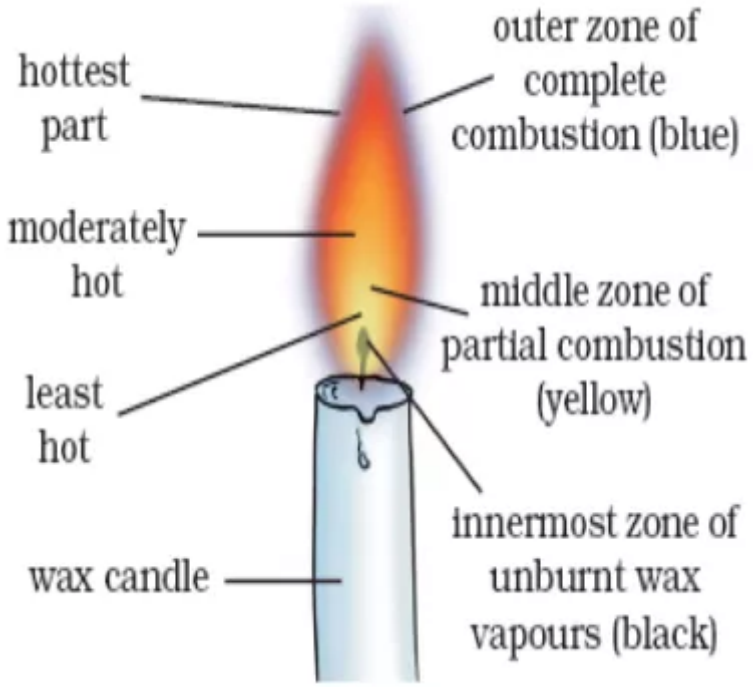
Question 53 A.
Make a labeled diagram of a candle flame.
Answer:



It is given in the following picture:

Question 53 B.
What makes the middle zone of a candle flame luminous(or light–giving)?
Answer
In the middle zone, partial combustion of the fuel takes place, so the colour of the flame is yellow and it is moderately hot part of the flame. It is the luminous part of the flame.

It is given in the following picture:



Question 54.
What is global warming? Name the gas whose increasing percentage in air is leading to global warming. State a harmful effect which can be caused by global warming.
Answer:
Global warming is the rise in temperature of earth atmosphere caused by the excessive amount of carbon dioxide in the air. Due to rise in the temperature of atmosphere, the ice in polar regions will melt very fast, producing a lot of water. Burning of fuels releases carbon dioxide in air in the environment. Increased percentage of carbon dioxide in air is causing global warming. Carbon dioxide gas in the air trap sun's heat rays by producing green house effect. Rise in water may cause a rise in the sea level leading to floods in coastal areas. The low-lying areas may be completely submerged under water leading to loss of life and property.

Question 55.
Explain how, burning if fuels such as coal, petrol and diesel leads to acid rain. How is acid rain harmful?
Answer:
Burning of coal, petrol and diesel produces sulphur dioxide which goes into the air. It is an extremely suffocating and corrosive gas. It may damage our lungs. The burning of petrol and diesel in the engines of vehicles also releases nitrogen oxides into the air. These oxides produced by the burning of fuels dissolve in rain water and form acids. The rain water containing acid is called acid rain. It is harmful for crops, soil and damages buildings.

Multiple Choice Questions (MCQs)

Question 56.
Which of the following substance has the lowest ignition temperature?
A. kerosene
B. spirit
C. diesel

D. mustard oil
Answer:
B. spirit
Spirit/petrol has the lowest ignition temperature and can catch fire easily.

Question 57.
One of the following is not a combustible substance. This one is:
A. alcohol
B. hydrogen
C. asbestos
D. chaff
Answer:
C. asbestos
Asbestos is a non combustible substance and cannot catch fire on its own.

Question 58.
Which of the following is not used in making matchsticks these days?
A. potassium chlorate
B. white phosphorus
C. antimony tri sulphide
D. red phosphorus
Answer:
B. white phosphorus
White phosphorus undergoes spontaneous combustion. Hence it is not used in making matchsticks now days.

Question 59.
Which of the following undergoes spontaneous combustion?
A. yellow sulphur
B. red phosphorus
C. white phosphorus
D. brown sulphur
Answer:
C. white phosphorus
white phosphorus undergoes spontaneous combustion. It catches fire on its own at room temperature.

Question 60.
which of the following statement is not correct about carbondioxide acting as a fire extinguisher for electrical fires?
A. it is heavier than air
B. it is lighter than air
C. it is not combustion
D. it does not support combustion
Answer:
B. it is lighter than air
Carbon dioxide is lighter than air and forms a layer around the burning substance. It covers the fire like a blanket due to which fresh air cannot reach the burning substance.

Question 61.
Fires in underground coalmines usually occur due to the:
A. explosive combustion
B. deliberate combustion
C. spontaneous combustion
D. rapid combustion
Answer:
C. spontaneous combustion
fires in underground coalmines occur due to spontaneous combustion of coaldust.

Question 62.
The calorific value of a fuel is 40000KJ/kg. This fuel is most likely to be:
A. biogas
B. methane
C. hydrogen gas
D. liquefied petroleum gas
Answer:
A. biogas
Biogas has calorific value of 40000Kj/Kg.

Question 63.
Which of the following fuels has the highest calorific value?
A. natural gas
B. liquefied petroleum gas
C. coal gas
D. hydrogen gas
Answer:
D. hydrogen gas
Hydrogen gas has the highest calorific value.

Question 64.
On a cold winter night, the person sleeping in a room with closed door and windows with a coal fire burning inside may die due to the excessive accumulation of:
A. nitrogen monoxide
B. nitrogen dioxide
C. carbon dioxide
D. carbon monoxide
Answer:
D. carbon monoxide
Due to the burning of coal, the available oxygen gets depleted and it leads to incomplete burning of coal. Incomplete combustion of coal gives carbon monoxide gas. It is a very poisonous gas. It is dangerous to burn coal in a closed room. The carbon monoxide gas produced can kill persons sleeping in that closed room

Question 65.
Which of the following burns without producing a flame?
A. camphor
B. coke

C. cooking gas
D. kerosene
Answer:
B. coke
Coke does not vapourise during burning and hence do not produce flame.

Question 66
On a cold winter night, the persons sleeping in a room with closed door and windows with a coal fire burning inside may die to the excessive accumulation of:
A. Kerosene
B. CNG
C. biogas
D. LPG
Answer:
B. CNG
CNG

Question 67.
Which of the following is the main cause of global warming?
A. nitrogen dioxide
B. sulphur dioxide
C. carbon dioxide
D. carbon monoxide
Answer:
C. carbon dioxide
Burning of fuels releases carbon dioxide in air in the environment. Increased percentage of carbon dioxide in air is causing global warming. Carbon dioxide gas in the air trap sun's heat rays by producing green house effect.

Question 68.
Which of the following gas does not contribute to the formation of an acid rain?
A. nitrogen monoxide
B. carbon monoxide
C. sulphur dioxide
D. nitrogen dioxide
Answer:
B. carbon monoxide
Carbon monoxide does not contribute to the formation of an acid rain.

Question 69.
Which of the following is the most environment friendly fuel to be used in automobiles?
A. petrol
B. diesel
C. natural gas
D. petroleum gas
Answer:
C. natural gas

The use of petrol and diesel as fuels in automobiles is being replaced by CNG because it produces very small amount of harmful gases.

Question 70.
Which of the following does not involve a combustion reaction?
A. production of heat and light from kerosene in a rocket
B. production of heat and light from hydrogen in a rocket.
C. production of heat and light from hydrogen in the sun
D. production of heat and light from wood in a bonfire.
Answer:
C. production of heat and light from hydrogen in the sun
production of heat and light from hydrogen in the sun is a nuclear reaction.

Question 71.
A heap of green leaves is lying in one corner of a park. The green leaves in the heap burn with difficulty because:
A. they contain a tough material called cellulose.
B. they contain a lot of water.
C. they contain a green pigment chlorophyll.
D. they do not get sufficient oxygen for burning
Answer:
B. they contain a lot of water.
The green leaves contain a lot of water. This water does not allow the green leaves to get heated to their ignition temperature and makes burning of green leaves difficult.

Question 72.
If the clothes of a person working in the kitchen catch fire, then to extinguish the fire:
A. sand should be thrown over the burning clothes
B. water should be thrown over the burning clothes.
C. polyester blanket should be used to cover the burning clothes
D. woolen blanket should be used to cover the burning clothes
Answer:
D. woolen blanket should be used to cover the burning clothes
If the clothes of a person working in the kitchen catch fire, the person is immediately covered with a blanket. When the burning clothes of a person are covered with a blanket, the supply of air to the burning clothes is cut off and hence the burning stops.

Question 73.
The outermost zone of a candle flame is the:
A. least hot part
B. coldest part
C. hottest part
D. moderately hot part
Answer:
C. hottest part
In the outer zone complete combustion of the fuel takes place and the colour of the flame is blue and is the hottest part of the flame.

Question 74.
The flame of a kerosene oil lamp (or lantern) has:
A. single zone
B. two zones
C. three zones
D. four zones
Answer:
C. three zones
It has three zones.

Question 75.
A lot of dry powder of one of the following chemicals can be released over a fire to extinguished it. This chemical is:
A. plaster of Paris
B. baking soda
C. washing soda
D. bitumen
Answer:
B. baking soda
To obtain carbon dioxide for extinguishing a fire is to release a lot of dry powder of chemicals like sodium bicarbonate(baking soda) or potassium bicarbonate over the fire.

Questions Based on High Order Thinking Skills (HOTS)

Question 76.
An electric spark is struck between two electrodes placed near each other in a closed tank full of petrol. Will the petrol catch fire. Explain your answer.
Answer:
As it is a closed tank full of petrol, there will be no supply of air. Hence the petrol will not catch fire as air is necessary for the combustion of petrol.

Question 77.
Give reason for the following:
Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not.
Answer:
A piece of paper wrapped around aluminium pipe does not catch fire easily. This is because aluminium, being a metal, is a good conductor of heat and hence heat is conducted away. Also, the ignition temperature of paper is lower compared to that of aluminium. When paper is wrapped around an aluminium pipe; the ignition temperature increases. That is why paper itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not.

Question 78.
Abida and Ramesh want to heat water taken in separate beakers. 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? Why?
Answer:
The yellow part of the flame is the middlemost part where Abida has kept the beaker. The fuel

vapours burn partially in the middle zone because there is not enough air of burning in this zone. The partial burning of fuel in the middle zone produces carbon particles. It has moderate temperature. Hence, Abida's beaker will take time to heat up.

Ramesh's beaker is kept in the outermost part of the flame. In this zone, complete combustion of the fuel takes place because there is plenty of air around it. The outermost zone has the highest temperature in the flame. It is the hottest part of the flame. Hence Ramesh's beaker gets heated in a shorter time.

Question 79.
When a lot of dry powder of a substance X is released over a fire, the fire gets extinguished.
(a) Name the substance X.
(b) How does this substance extinguish the fire?
(c) Name another substance which behaves like X.
Answer:
(a) Sodiumbicarbonate (sodiumhydrogencarbonate)
(b) The heat of fire decomposes sodium bicarbonate to produce carbondioxide gas. This carbon dioxide covers the fire like a blanket and cuts off supply of fresh air to the burning substance. Due to this the fire gets extinguished
(c) Potassium bicarbonate(or Potassium hydrogen carbonate)

Question 80.
What type of combustion is represented by:
(a) burning of white phosphorus in air at room temperature?
(b) burning of LPG in a gas stove?
(c) ignition of a cracker?
(d) burning of coal dust in a coalmine?
Answer:
(a) Burning of white phosphorus in air at room temperature is a spontaneous combustion. The type of combustion in which a material suddenly bursts into flames, without the application of any apparent cause is called spontaneous combustion.

(b) Burning of LPG is combustion in which a substance burns rapidly and produces heat and light with the help of external heat.

(c) Ignition of a cracker is a combustion in which a substance burns suddenly and produces heat, light and sound with the help of heat or pressure.

(d) Burning of coal dust in a coalmine is a spontaneous combustion. The type of combustion in which a material suddenly bursts into flames, without the application of any apparent cause is called spontaneous combustion.