CHAPTER 4-MATERIALS : METALS AND NON-METALS

Question 1. Which of the following can be beaten into thin sheets?

(a) Zinc **(✓)** (b) Phosphorus (c) Sulphur (d) Oxygen

Question 2. Which of the following statements is correct?

(a) All metals are ductile. (b) All non-metals are ductile.

(c) Generally, metals are ductile. **(✓)** (d) Some non-metals are ductile.

Question 3 Fill in the blanks.

(a) Phosphorus is a very **reactive** non-metal.

(b) Metals are **good** conductors of heat and **electricity**.

(c) Iron is **more** reactive than copper.

(d) Metals react with acids to produce **hydrogen** gas.

Question 4. Mark 'T' if the statement is true and 'F' if it is false.

(a) **Generally, non-metals react with acids. (F)**

(b) **Sodium is a very reactive metal. (T)**

(c) **Copper displaces zinc from zinc sulphate solution. (F)**

(d) **Coal can be drawn into wires. (F)**

Question 5. Some properties are listed in the following Table. Distinguish between metals and non-metals on the basis of these properties.

Answer-

Properties	Metals	Non-Metals
1. Appearance	Shiny	Dull
2. Hardness	Very hard	Hard or Soft
3. Malleability	Malleable	Not malleable
4. Ductility	Ductile	Non ductile
5. Heat conduction	Conductor of heat	Non-conductor of heat
6. Conduction of Electricity	Conductor of electricity	Non conductor of electricity

Question 6- Give reasons for the following.

(a) Aluminium foils are used to wrap food items.

Ans- Because aluminium metal is malleable. Therefore, it can be beaten into thin foils. Also a layer of aluminium oxide on aluminium foil make it non reactive with food.

(b) Immersion rods for heating liquids are made up of metallic substances.

Ans- Because metals are good conductors of heat and electricity.

(c) Copper cannot displace zinc from its salt solution.

Ans- Because copper is less reactive metal than zinc.

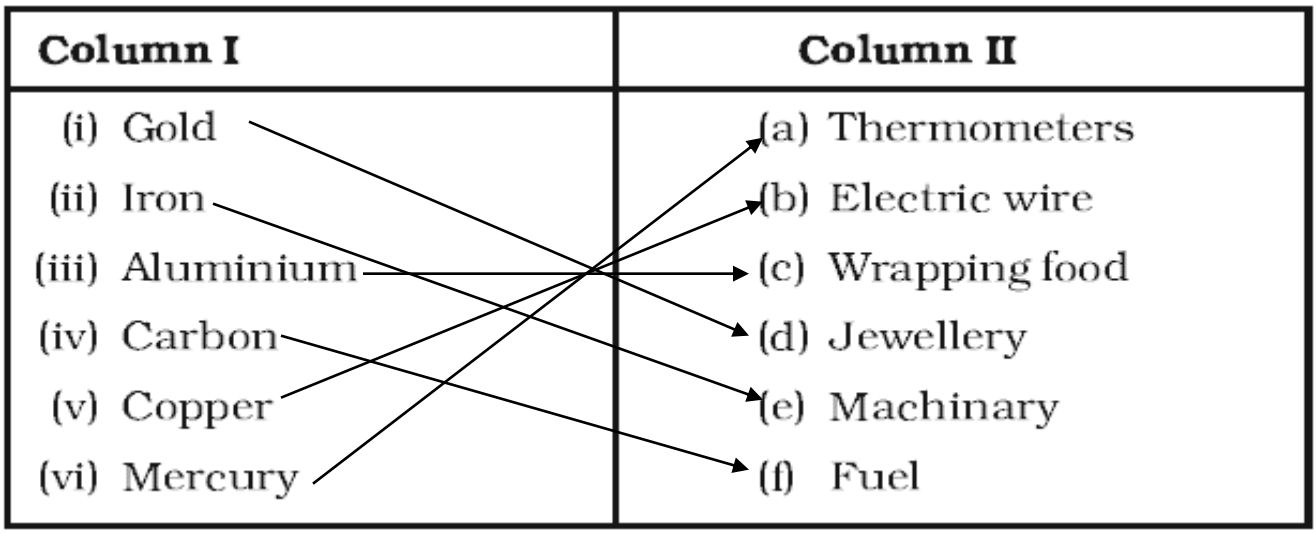
(d) Sodium and potassium are stored in kerosene.

Ans- Because they are highly reactive elements. They can easily catch fire even when in contact with air.

Question 7. Can you store pickle in an aluminium utensil? Explain.

Answer- As lemon pickle contains acid so it cannot be stored in metallic vessels as acids readily react with metals to produce hydrogen gas.

Question 8. Match the substances given in Column A with their uses given in Column B.



Question 9. What happens when

(a) Dilute Sulphuric acid is poured on a copper plate?

(b) Iron nails are placed in copper sulphate solution?

Write word equations of the reactions involved.

Answer- (a) No reaction will take place because copper is less reactive than hydrogen.

Copper sulphate + Sulphuric acid ⟶ No reaction

(b) When iron nails are placed in copper sulphate solution, Cu is displaced by iron and solution turns green from blue. Chemical equation is as follows:

Iron nails + Copper sulphate solution ⟶ Iron sulphate + copper.

(blue) (light green)

Question 10. Soloni took a piece of burning charcoal and collected the gas evolved in a test tube.

(a) How will she find the nature of the gas?

(b) Write down word equations of all the reactions taking place in this process.

Answer- (a) When charcoal is burnt in air, carbon dioxide gas is evolved. This gas when passed into the lime water, turns it milky. This is the test for CO_2 gas.

(b) Carbon + Oxygen $\longrightarrow$ Carbon dioxide gas.

Question 11. One day Reeta went to a jeweller's shop with her mother. Her mother gave an old gold Jewellery to the goldsmith to polish. Next day when they brought the Jewellery back, they found that there was a slight loss in its weight. Can you suggest a reason for the loss in weight?

Answer- In polishing, the jeweler put the gold Jewellery in a mild acid solution (aqua regia), which on reaction with acid goes into the solution. So, this process certain amount of gold is lost to the acidic solution.

Question 12. Write differences between metals and non metals.

Answer-

Metals	Non-metals
1. Metals are generally malleable and ductile.	1. Non-metals are non-malleable and non-ductile
2. Metals are good conductors of heat.	2. Metals are bad conductors of heat.
3. Metals are good conductors of electricity.	3. Metals are bad conductors of electricity.
4. Metals are generally hard.	4. Non-metals are generally soft or hard.
5. Metals look shiny.	5. Non-metals look dull.
6. Metals are generally sonorous.	6. Non- metals are non-sonorous.
7. Metals react with acids to liberate hydrogen gas.	7. Non-metals generally do not react with acids.
8. Oxides of metals are generally basic.	8. Oxides of non-metals are generally acidic.
9. Metals can donate electrons.	9. Non-metals can gain electrons.
10. Metals can form positive ion (cations).	10. Non-metals can form negative ions (anions).

ONE MARK MCQs

1. Prabhsimran bought an idol (statue) made of copper from a fair, but he was astonished to see that the idol was covered with a light green coating on its surface after some days. The light green coating on the statue is mixture of -

a) copper hydroxide and copper carbonate **(✓)**

b) copper sulphate and copper hydroxide

c) copper sulphate and copper carbonate

d) none of these

2. Name the metal which is used in thermometer and it is in liquid state at room temperature.

a) Alcohol b) Graphite c) Mercury **(✓)** d) Iron

3. Tejinder accidentally left a non metal in open air, the non metal started burning. Name the non metal?

a) Mercury b) Copper c) Phosphorus **(✓)** d) none of these

4. In temples, bells are made up of metal instead of wood. Metal produces sound waves that's why they are known as…….

a) Conductors b) Ductile c) Weak d) sonorous **(✓)**

5. While performing test for the gas evolved, when the teacher brought a burning matchstick near the mouth of the test tube, the gas evolved burnt by producing a pop sound. Name the gas evolved.

a) Carbon dioxide b) Oxygen c) Nitrogen d) Hydrogen **(✓)**

6. Balkaran immersed an iron nail into copper sulphate solution. The blue colour of copper sulphate solution changes to

a) blue to pink b) blue to green**(✓)** c) blue to black d) none of these

7. Mohit felt tired after doing a little work only. When he visited his doctor, he was told that he had iron deficiency. Where did Mohit have iron in his body?

a) In bones b) In blood **(✓)** c) In hair d) none of these

8. Magnesium oxide is obtained by burning magnesium ribbon in air. What is the nature of magnesium oxide?

a) acidic b) basic **(✓)** c) natural d) none of these

9. Raman is beating a piece of material into thin sheet. Which material is Raman beating from the given below

a) copper **(✓)** b) Sulphur c) chlorine d) oxygen

10. Ravinder had seen that blacksmith is hammering iron nail and it turns into sheet. This conversion of nail to sheet depicts which nature of iron.

a) ductility b) Malleability **(✓)** b) Lustre d) sonorous

11. Sarabjit's mother was holding the metal's kettle with a piece of cloth because it's wooden handle was broken . She used cloth to lift the kettle because cloth is:

a) good conductor of heat b) poor conductor of heat**(✓)** c) friend of heat d) none of these

12. Aman had learned that metal are hard but his teacher had cut one of the metal with knife. Name the metal used by the teacher.

a) Potassium **(✓)** b) Copper c) Aluminum d) Iron

13. In the following circuit which material can be used instead of iron nail to complete the circuit.

a) Graphite **(✓)** b) plastic c) Wood d) Rubber

14. Which of the following can be beaten into sheets?

a) Carbon b) Phosphorous c) Iodine d) Iron **(✓)**

15. Balkaran added zinc granules to ferrous sulphate solution . The green colour of ferrous sulphate solution disappeared after some time .What could be the possible cause of this colour disappearance.

a) zinc is more reactive than iron so it displaces iron from its solution. **(✓)**

b) iron is more reactive than zinc so the colour disappear.

c) can't say anything about the colour change

d) none of these.

16. Anhad had dissolved 'X' compound into water. He obtained a bright blue coloured solution. Name compound X he had used.

a) Zinc sulphate b) Iron sulphate c) Copper sulphate **(✓)** d) none of these

17. Avnoor had used aluminium foil paper to complete the circuit. After inserting the battery , blubs glows. From this what we can say about the nature of aluminium foil.

a) aluminium is metal **(✓)** b) aluminium is non metal

c) aluminium is bad conductor d) none of these

18. Manpreet dipped red litmus paper into rust solution. The colour of red litmus turns blue. What would be the possible cause of this change?

a) Rust solution is acidic in nature. b) Rust solution is basic in nature. **(✓)**

c) Rust solution is neutral. d) None of these.

19. Gagan was taught by his teacher that hydrogen gas is produced when metals react with acid ,but when he placed a metal in dilute hydrochloric acid , no reaction occurred . Which metal did he placed in dilute HCl ?

a) Magnesium b) Iron c) Copper **(✓)** d) Aluminium

20. Teacher asked Manpreet about a non metal which has lustre. Name that non metal?

a) Coal b) Chlorine c) Phosphorus d) graphite **(✓)**

21. Simran enquired her mother that why can't we store or keep lemon pickle in Aluminium vessel?

a) pickle turn sour. b) pickle turn sweet

c) pickle becomes poisonous d) vessel will get corroded **(✓)**

22. Element copper is mainly used to manufacture electrical wires and cooking utensils. Which of the following is NOT a property of copper ?

a) ductility b) malleability c) low melting point **(✓)** d) good conductor of heat

23. Two elements A and B on burning in air give corresponding oxides . Oxides of both A and B are soluble in water. The aqueous solution of A is alkaline and reacts with aqueous solution of oxide of B to give another compound. Identify A and B.

a) A and B are metals b) A and B are non-metals

c) A is metal and B is non-metal **(✓)** d) A is non-metal and B is metal

24. Name the least reactive metal out of the following?

a) Silver b) Gold c) Copper d) Platinum**(✓)**

25. Harpreet burnt a piece of charcoal (carbon) and collected the gas evolved during the burning process. Name the gas he collected.

a) Oxygen b) Sulphur dioxide c) Carbon dioxide **(✓)** d) Carbon mono-oxide

26. Name a metal that is so soft that it can be cut with knife and also it is so reactive that it can not be placed in open air.

a) Phosphorus b) Iron c) Potassium **(✓)** d) Aluminium

27. Mehak observed the lustre of new copper utensils is lost after some period of usage . A green coloured layer is formed over them. What is the reason behind this ?

a) Copper oxide layer is formed over it b) Copper carbonate layer is formed over it **(✓)**

c) Due to corrosion of copper **(✓)** d) None of these

28. What is the nature of oxide of non metal ?

a) Basic b) Acidic **(✓)** c) Neutral d) None of these

29. Name the type of reaction in which more reactive metal displaces less reactive metal from its salt solution?

a) Combination reaction b) Displacement reaction **(✓)**

c) Decomposition reaction d) Doubled displacement reaction

30. Which of the following is not a ductile element?

a) Silver b) Copper c) Sulphur **(✓)** d) Aluminium

31. Teacher gave Vicky four different samples of elements and asked him which sample can be beaten into sheet by hammering?

a) Crystal of iodine b) Piece of sulphur c) Piece of iron **(✓)** d) Piece of zinc

32. Name the Non metal element whose isotope is good conductor of electricity?

a) Gallium b) Silicon c) Carbon **(✓)** d) Copper

33. Study the characteristics of substance 'X' given below.

1. High melting point

2. Good conductor of electricity

3. Malleable

Based on the above characteristics, what could 'X' be?

a) Silicon b) Sodium chloride c) Iron **(✓)** d) Carbon

34. Which of the following element react vigorously with oxygen?

a) Carbon b) Sodium **(✓)** c) Silver d) Gold

35. Out of the following which is safer to store Sodium and Potassium?

a) Water b) Kerosene oil **(✓)** c) Glass bottle d) Plastic bottle

36. Which of the following non metal can be safely kept in water?

a) Oxygen b) Phosphorous **(✓)** c) Nitrogen d) Chlorine

37. Which gas is produced when Aluminium metal reacts with Sodium Hydroxide solution?

a) Oxygen b) Hydrogen **(✓)** c) Carbon dioxide d) nitrogen

38. What is the nature of Sulphur dioxide gas?

a) Acidic **(✓)** b) Basic c) Neutral d) Both

39. Inside of food cans are coated with tin and not with zinc because

a) Zinc is costlier than tin b) zinc has higher melting point than tin

c) Zinc is more reactive than tin **(✓)** d) zinc is less reactive than tin

40. Name the non metal whose violet colored solution is used as an antiseptic?

a) Phosphours b) Iodine **(✓)** c) Sulphur d) Calcium

CHAPTER 6-COMBUSTION AND FLAME

Question 1. List conditions under which combustion can take place.

Answer- There are certain conditions required for combustion to take place. They are:

(i) Presence of a fuel,

(ii) Air (or oxygen),

(iii) Temperature greater than ignition temperature.

Question 2. Fill in the blanks.

(a) Burning of wood and coal causes **Pollution** of air.

(b) A liquid fuel, used in homes is **Kerosene**.

(c) Fuel must be heated to its **Ignition Temperature** before it starts burning.

(d) Fire produced by oil cannot be controlled by **Water.**

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

Answer- As the amount of unburnt carbon particles produced is very less in comparison to petrol and amount of harmful gases produced is also very less ,so CNG is comparatively a cleaner fuel than petrol.

Question 4. Compare LPG and wood as fuels

Answer-

LPG	Wood
1. Leaves no residue after burning.	1. Leaves a lot of ash on burning.
2. It can be easily stored and transported.	2. It cannot be easily stored or transported.
3. It burns easily.	3. It burns comparatively with difficulty.
4. It has low ignition temperature.	4. It has high ignition temperature.
5. It is almost pollution free.	5. It causes a lot of pollution.

Question 5. Give reasons.

(a) Water is not used to control fires involving electrical equipment.

Answer- Because water is a good conductor of electricity, so it may result in electric shock to the user while controlling fire involving electrical equipments with water.

(b) LPG is a better domestic fuel than wood.

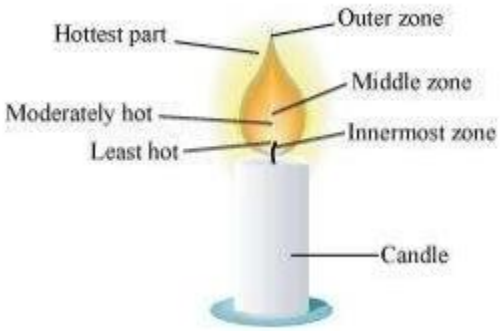
Answer- Because LPG neither produces pollution nor leave residue, on burning as compared to wood. LPG has much higher calorific value than wood.

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

Answer- This is because aluminium, being a metal, is a good conductor of heat. Therefore, heat is transferred from the paper to the metal and the paper does not attain its ignition temperature.

Question 6- Make a labelled diagram of a candle flame.

Answer-



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

Answer- Calorific value is defined as the energy contained in the fuel. It is expressed in the form kilojoule per kilogram (kJ/kg).

Question 8. Explain how CO_2 is able to control fires.

Answer- CO_2 being heavier than oxygen, covers the fire like blanket and also brings down the temperature of fuel. Since the contact between the fuel and oxygen is cut off, the fire comes under control.

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

Answer- Green leaves have a lot of moisture in them. This moisture does not allow them to catch fire easily. However, dry leaves have no moisture in them. Therefore, they catch fire easily.

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

Answer- Goldsmiths use the outermost part/zone of the flame to melt gold and silver. This is because the outermost zone of the flame undergoes complete combustion and is the hottest part of the flame.

Question 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.

Answer- Calorific value of fuel is = $\frac{\mathbf{180000\ kJ}}{\mathbf{4.5\ kg}}$ = 40,000 kJ/kg.

Question 12. Can the process of rusting be called combustion? Discuss.

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 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?

Answer- The water in the Ramesh's beaker will heat up in a shorter time. This is because the outermost zone of a flame is the hottest zone, while the yellow zone (in which Abida had kept the beaker) is less hot.

ONE MARK MCQs

1. If you hold a piece of iron wire with a pair of tongs inside pure oxygen in a candle flame or Bunsen burner flame. Name the colour of flame with which it will burn ?

a) Blue b) Gold **(✓)** c) Blue- Green d) light purple

2. The ignition temperature of four substances P, Q, R and S are 125ºC, 270ºC, 150ºC and 310ºC respectively. Which of following pairs of substances catches fire at 250ºC?

a) Q & S b) P & R **(✓)** c) R & S d) P & Q

3. Ankit was surprised after watching an experiment in science lab, His teacher put substance that catches fire spontaneously in presence of air, at room temperature. The name of that substance was

a) White phosphorous **(✓)** b) sulphur c) Calcium d) Iron

4. Why is L.P.G, used as domestic fuel, mixed with a strong smelling volatile liquid like mercaptan?

a) For better combustion b) For good smell

c) For detection of gas leakage **(✓)** d)For high calorific value

5. The given table lists some of the fuel along with their calorific temperature

Fuel	calorific value (KJ/g)	Ignition temperature (0ºC)
P	**100**	**5**
Q	**80**	**50**
R	**30**	**60**
S	**20**	**70**

Which of the following fuel is an ideal fuel?

a) P b) Q **(✓)** c) R d) S

6. Choose the correct option.

a) Air is not necessary for combustion. b) Magnesium is a non-combustible metal.

c) CO_2 is an excellent fire extinguisher. **(✓)** d) Caloric value of wood is higher than that of Coal.

7. Match the following item of column A with the item of column B for the Flame of Candle.

Column A	Column B
Hottest part	1) Yellow
Moderately Hot	2) Blue
Least Hot	3) Black

8. Hydrogen gas has the highest calorific value i.e, 150 kJ /kg, yet it is not used as a fuel. Why?

a) it is explosive in nature **(✓)** b) is limited in nature

c) it causes storage problem (d) it causes transportation problem

9. Juhi observes that kerosene oil and molten wax burn with flame but charcoal does not produce a flame. She concluded that it is due to

a) Charcoal is hard and kerosene and wax are soft

b) The substances which produces vapours during burning give flame **(✓)**

c) Both (a) and (b) are correct.

d) None of these

10. During birthday celebration, Raghav noticed that a candle flame always points upwards. The possible reason could be ?

a) Gases produced in a flame are cool, hence lighter. Therefore, they rise up.

b) Gases produced in a flame are hot, hence lighter. Therefore, they rise up. **(✓)**

c) Both (a) and (b) are correct.

d) None of these

11. Ram and Rahim were doing an experiment in which water was to be heated in a beaker. Ram kept beaker near the wick in the yellow part of the candle flame. Rahim kept the beaker in outermost part of the flame. Whose water will get hot in shorter time?

a) Ram‘s beaker will heat up in shorter time

b) Rahim‘s beaker will heat up in shorter time **(✓)**

c) Both (a) and (b)

d) None of these

12. Aman saw a fire in the wood and fire goes off when water is poured over burning wood. He asked his science teacher about the reason

a) It happens because water absorbs a large amount of heat and decreases the ignition temperature of wood and fire goes off. **(✓)**

b) Water cut the supply of oxygen which is necessary to catch fire.

c) Nothing to do with Ignition temperature

d) Both (a) and (b) are correct.

13. Ankita saw if kerosene oil is heated a little, it will catch fire But if wood is heated a little it would not catches fire . It is due to

a) Ignition temperature of kerosene oil is lower than that of wood **(✓)**

b) Ignition temperature of kerosene oil is more than that of wood

c) Kerosene react abruptly with oxygen

d) None of these

14. The Head of safety match stick contain red brown substances which is made of :

a) Antimony trisulphate b) Potassium chloride

c) Both (a) and (b) **(✓)** d)None of theses

15. A family consume 12kg of L.P.G.in 30 days. Calculate the average energy consumed per day, if the calorific value of L.P.G. is 50 kJ/kg.

a) 10000 J per day b) 15000 J per day

c) 20000J per day **(✓)** d) 25000 J per day

16. Amount of heat energy produced on ____combustion of 1kg of fuel is Calorific value.

a) Incomplete b) Complete **(✓)** c) Half d) None of these

17. Inspite of the danger involved with hydrogen, it is used for some application. Where it is used?

a) Rocket fuel **(✓)** b) Oxyhydrogen flame c) Car fuel d) All of above

18. In summer we feel very hot, It is because of global warming. Global Warming occurs due to _____ concentration of CO_2 in air.

a) Decreased b) increased **(✓)** c) Both (a) and (b) d) None of these

19. In Agra, The Taj Mahal marbleis getting corroded due to acid rain. This rain is caused by Oxide of:

a) Sulphur, Nitrogen **(✓)** b) Carbon, Nitrogen

c) Sulphur, Carbon d) Phosphorous, Carbon

20. Arrange the following fuels in the increasing order of their calorific value

(1). Petrol	(2). Wood	(3). Coal	(4). Natural gas

a) (1), (2), (3) & (4) b) (2), (3), (4) & (1)

c) (2), (1), (3) & (4) d) (2). (3), (1) & (4) **(✓)**

21. When the match stick is struck against rubbing surface, red phosphorous

a) Convert into white phosphorous **(✓)** b) React with potassium chloride

c) Ignite antimony trisulphate d) None of these

22. If the temperature falls below its ignition temperature, then what happens to the burning substances?

a) it gets extinguished **(✓)** b) it burns brightly

c) it burns dimly d) it burns with smoke

23. When methane burns in air, what are the products formed?

a) $CO_2 + 2H_2O$+ Heat **(✓)** b) $CO_2 + H_2$ c) $CO + O_2$ d) $CO_2 + O_2$ + Heat

24. On placing an inverted tumbler over a burning candle, the flame extinguishes after some time. This is because of non-availability of

a) Oxygen **(✓)** b) Water Vapours c) Carbon dioxide d) Wax

25. Shayam was cooking potato curry on a chulla. 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

26. The lowest temperature at which a substance catches fire is called its _

a) Boiling point b) Melting point

c) Ignition temperature **(✓)** d) Critical temperature

27. During combustion of fuel unburnt carbon particle are released and they cause :

a) Stomach infection b) Respiratory problems**(✓)**

c) Brain infection d) Throat problems

28. Raman went to repair ear ring with her mother to goldsmith. She observes that Goldsmith uses _____ part of the flame for melting gold.

a) Outermost **(✓)** b) Middle c) Innermost d) Both (a) and (b)

29. During activity a teacher put Magnesium ribbon in burner's flame in air, it produces

a) Magnesium oxide, water and light b) Magnesium oxide and Heat

c) Magnesium oxide, heat and light **(✓)** d) Magnesium oxide, water and heat

30. Which of the following is not a combustible substance?

a) Camphor b) Glass **(✓)** c) Straw d) Alcohol

CHAPTER- 11-FORCE AND PRESSURE

Question 1. Give two examples each of situations in which you push or pull to change the state of motion of objects.

Answer- Two examples of push or pull force are as follows:

(i) When we push or pull a box, then its state of motion changes.

(ii) When we push or pull a bicycle, its state of motion changes.

Question 2. Give two examples of situations in which applied force causes a change in the shape of an object.

Answer- (i) Squeezing of a plastic bottle changes the shape of the bottle.

(ii) Deformation of clay by pressing it between the hands.

(iii) Making a chapati from a ball of dough.

Question 3 Fill in the blanks

(a) To draw water from a well we have to **pull** at the rope.

(b) A charged body **attracts** an uncharged body towards it.

(c) To move a loaded trolley we have to **pull** it.

(d) The north pole of a magnet **repels** the north pole of another magnet.

Question 4. An archer stretches her bow while taking aim at the target. She then releases the arrow, which begins to move towards the target. Based on this information fill up the gaps in the statements using the following terms.

Muscular, contact, non-contact, gravity, friction, shape, attraction

(a) To stretch the bow, the archer applies a force that causes a change in its ____ **shape** __.

(b) The force applied by the archer to stretch the bow is an example of ___ **Muscular** _____ force.

(c) The type of force responsible for a change in the state of motion of the arrow is an example of a _ **contact** _ force.

(d) While the arrow moves towards its target, the forces acting on it are due to __ **gravity** __and that due to ____ **friction** _____ of air.

Question 5. In the following statements identify the agent exerting the force and object on which its acts. State the effect of the force in each case.

(a) Squeezing a piece of lemon between the fingers to extract its juice.

(b) Taking out paste from a toothpaste tube.

(c) A load suspended from a spring while its other end is on a hook fixed to a wall.

(d) An athlete making a high jump to clear the bar at a certain height.

Answer-

	Agents exerting force	Object on which force acts.	Effect of force
(a)	Fingers	Lemon	Lemon juice is extracted
(b)	Fingers	Toothpaste tube	Toothpastes comes out
(c)	A load	Spring	The spring expands
(d)	An athlete	On the legs	Cleans the height

Question 6- A blacksmith hammers a hot piece of iron while making tool. How does the force due to hammering affect the piece of iron?

Answer- The shape of the hot piece of iron changes. It flattens and becomes thinner than earlier. This is the effect of force due to hammering the piece of iron.

Question 7. An inflated balloon was pressed against a wall after it has been rubbed with a piece of synthetic cloth. It was found that the balloon sticks to the wall. What force might be responsible for the attraction between the balloon and the wall?

Answer- This is an electrostatic force.

Question 8. Name the forces acting on a plastic bucket containing water held above ground level in your hand. Discuss why the forces acting on the bucket do not bring a change in its state of motion.

Answer- A bucket filled with water held above the ground experiences two types of forces:

1. Muscular force (acting upwards)

2. Gravity (acting downwards)

These two forces are balanced because they are equal in magnitude but act in opposite directions. So, the net force on the bucket is zero and hence the state of motion of the bucket remains unchanged.

Question 9. A rocket has been fired upwards to launch a satellite in its orbits. Name the two forces acting on the rocket immediately after leaving the launching pad.

Answer- The two forces acting on the rocket immediately after leaving the launching pad are:

(i) Upward force applied by the rocket engine.

(ii) Downward gravitational force applied by the Earth.

Question 10- When we press the bulb of a dropper with its nozzle kept in water, air in the dropper is seen to escape in the form of bubbles. Once we release the pressure on the bulb, water gets filled in the dropper. The rise of water in the dropper is due to

(a) Pressure of water.

(b) Gravity of the earth.

(c) Shape of rubber bulb.

(d) Atmospheric pressure. (✓)

ONE MARK MCQs

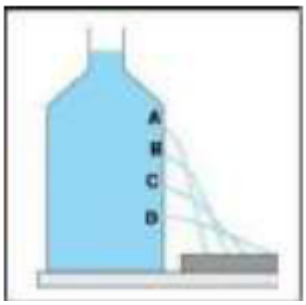
1. Force is a push or pull which helps in changing of an object.

(a) Position (b) Direction (c) Shape (d) All **(✓)**

2. Force acting per unit area is called

(a) Density (b) Pressure **(✓)** (c) Volume (d) Thrust

3. In the adjoining figure at which point is the pressure maximum?



(a) At point A (b) At point B (c) At point C (d) At point D **(✓)**

4. Forces acting in the same direction on an object gets …….

(a) Diminished (b) Divided (c) Added **(✓)** (d) none

5. What happens to the speed of an object if the applied force acts in the direction of the motion of the object.

(a) Decreases (b) Increases **(✓)** (c) Remains same (d) Changes its direction

6. What happens to the speed of an object if the applied force acts in the direction opposite to the direction of motion of an object?

(a) Decreases **(✓)** (b) Increases (c) Remains same (d) All may be true

7. What will be the speed of the object if it is at rest?

(a) Infinite (b) Zero v **(✓)** (c) Very High (d) Very Slow

8. Which force/forces act while holding a bucket of water?

(a) Magnetic force (b) Gravitational force (c) Muscular force (d) Both (b) and (c) **(✓)**

9. Why a ball rolling on the floor stops after some time?

(a) Ball becomes light (b) Due to friction **(✓)**

(c) Ball becomes heavy (d) Due to gravitational force

10. North pole of a bar magnet repels the north pole of another bar magnet. The force acting is ……..

(a) Non contact force **(✓)** (b) Contact force

(c) Gravitational force (d) Muscular force

11. The force exerted by a charged body on another charged or uncharged body is called….

(a) Magnetic force (b) Electrostatic force **(✓)**

(c) Gravitational force (d) Muscular force

12. A coin when dropped left from certain height starts moving towards the earth under the influence of……

(a) Gravitational force **(✓)** (b) Muscular force

(c) Magnetic force (d) Electrostatic force

13. A porter carrying a heavy luggage on his head always keeps a round wrap of cloth on his head. Why?

(a) It decreases the weight of luggage (b) To protect from injury

(c) It increases the area of contact between his head and luggage. **(✓)** (d) To Show to the other people.

14. What makes a balloon stretch as it is filled with air?

(a) Air becomes lighter inside the balloon. (b) Air becomes heavier inside the balloon.

(c) Gas exerts pressure on the walls of container **(✓)** (d) All of the above

15. Why we do not get crushed under atmospheric pressure exerted by the gases around us?

(a) Because our body is made of bones.

(b) Because pressure inside our body is equal to the atmospheric pressure. **(✓)**

(c) Because air is very light which can do nothing to our body. (d) All of the above.

16. Why water tanks are always kept on the top of the building?

(a) As it increases the height of of the water column.

(b) Water flows from taps with greater pressure.

(c) Pressure is directly proportional to the height of liquid column

(d) All the above **(✓)**

17. Why is the base of a wall kept wide?

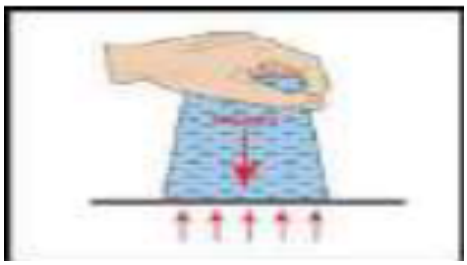
(a) To increase the pressure on the base of wall. (b) To decrease the pressure on the base of wall. **(✓)**

(c) To make the wall beautiful. (d) All the above

18. Choose the correct classification of contact and non contact forces from the following Contact Forces Non Contact Forces

Contact Forces	Non Contact Forces
(a) Magnetic force, Frictional force	Muscular force, Gravitational force, Electrostatic force
(b) Gravitational force, Electrostatic force	Frictional force, Muscular force, Magnetic force
(c) Muscular force, Frictional force,	Magnetic force, Gravitational force, Electrostatic force
(d) None of the above.	

19. As shown in the diagram cardboard placed over the top of a glass filled with water when pressed and inverted does not fall. Why?



(a) Glass attracts the cardboard.

(b) Water attracts the cardboard.

(c) Glass and Water both attracts the cardboard

(d) The atmospheric pressure acts on the card board from below and in the upward direction. **(✓)**

20. Why water comes out of the pipes used for water supply through the leakage joints?

(a) Because water always tends to flow out. (b) It is easy for water to flow out.

(c) Because of pressure exerted by water on the walls of the pipe. **(✓)** (d) all of the above

CHAPTER- 12-FRICTION

Question 1. Fill in the blanks.

(a) Friction opposes the **motion** between the surfaces in contact with each other.

(b) Friction depends on the **nature** of surfaces.

(c) Friction produces **heat**.

(d) Sprinkling of powder on the carrom board **reduces** friction.

(e) Sliding friction is **lesser** than the static friction.

Question 2. Four children were asked to arrange forces due to rolling, static and sliding frictions in a decreasing order. Their arrangements are given below. Choose the correct arrangement.

(a) rolling, static, sliding

(b) rolling, sliding, static

(c) static, sliding, rolling **(✓)**

(d) sliding, static, rolling

Question 3. Alida runs her toy car on dry marble floor, wet marble floor, newspaper and towel spread on the floor. The force of friction acting on the car on different surfaces in increasing order will be:

(a) wet marble floor, dry marble floor, newspaper and towel. **(✓)**

(b) newspaper, towel, dry marble floor, wet marble floor.

(c) towel, newspaper, dry marble floor, wet marble floor.

(d) wet marble floor, dry marble floor, towel, newspaper

Question 4. Suppose your writing desk is tilted a little. A book kept on it starts sliding down. Show the direction of frictional force acting on it.

Answer- Frictional force will act upward i.e. direction opposite to that of sliding book.

Question 5. You spill a bucket of soapy water on a marble floor accidently. Would it make it easier or more difficult for you to walk on the floor? Why?

Answer-It is difficult to walk on a soapy floor because soapy floor applies very less friction and hence we can slip on such floor.

Question 6- Explain why sportsmen use shoes with spikes.

Answer- Sportsmen use shoes with spikes because these shoes give them a better grip while running. This is because the force of friction between the shoes and the ground increases with the help of spikes.

Question 7. Iqbal has to push a lighter box and Seema has to push a similar heavier box on the same floor. Who will have to apply a larger force and why?

Answer- Seema will have to apply larger force, as heavy box interlock with ground to much extent. So heavy box have large force of friction.

Question 8. Explain why sliding friction is less than static friction Answer- A bucket filled with water held above the ground experiences two types of forces:

Answer- When an object has already started moving (sliding), the irregularities on its surface do not get enough time to lock into the irregularities on the surface of the other object completely. Therefore, the sliding friction is less than the static friction.

Question 9. **Give examples to show that friction is both a friend and a foe.**

Answer- Advantages of the friction:

a) Due to friction, we are able to walk.

b) We are able to write because of the friction between the tip of the pen and paper.

Disadvantages of friction:

a) Because of friction, the tires and soles of shoes wear out.

b) Friction produces heat between different parts of the machines. This can damage the machines.

Question 10- Explain why objects moving in fluids must have special shapes.

Answer- This frictional force by fluid on a moving body in it, depends on the shape of the body. By giving the objects a special shape, the force of friction acting on it can be minimized. Hence, it becomes easier for a body to move through the fluid.

ONE MARK MCQs

1. Why is it difficult to walk on a smooth and wet floor?

A. Due to more friction B. Due to very less friction **(✓)** C. Due to gravity D. None

2. Frictional Force always acts in _____ direction?

A. Upward B. Direction of motion of object

C. Downward D. Direction opposite to the motion of the object **(✓)**

3. Spring Balance is used to measure_____?

A. Direction of the force B. Density

C. Force of gravity acting on a body **(✓)** D. None

4. Frictional Force Depends on _____.

A. Speed of the object B. Smoothness of the surface

C. Roughness of the surface D. B and C both **(✓)**

5. Frictional Force is produced because of _____?

A. Irregularities in two contacting surfaces. **(✓)** B. To stop moving object

C. To make an object move easily D. None

6. Why grooves are made in tyres?

A. To reduce friction
B. To increase friction. (✓)
C. To make the tyres look beautiful
D. To reduce consumption of fuel.

7. Why rolling friction is less than the sliding friction?

A. Direction of frictional force changes
B. Moving object becomes lighter
C. Because it is easier for a body to roll over another in comparison to slide (✓)
D. All of above.

8. Name the system which converts sliding friction to rolling friction?

A. Ball bearing (✓) B. Airplane C. Bus D. None

9. Friction produces _____

A. Cooling B. Ice C. Steam D. Heat (✓)

10. Why talcum powder is spread on the carrom board?

A. To reduce friction
B. To make the surface of carrom board smooth
C. To make the carrom coins (goti) move longer distance
D. All of the above. (✓)

11. What are factors responsible for friction?

A. Nature of surface in contact
B. Area of contact
C. The force with which both surfaces are pressed
D. All (✓)

12. Friction is not useful for us, why?

A. It causes wear and tear
B. Loss of energy
C. The heat produced during friction destroys the machine
D. All (✓)

13. Why the shapes of objects moving in fluids (air and water) are streamlined?

A. To reduce the friction (✓)
B. To increase the friction.
C. To make it look beautiful
D. None

14. _____ is used to reduce the friction in moving parts of the machines

A. Oil or grease (✓) B. Sand C. Water D. Petrol

15. What are the factors on which the friction produced in fluids depends?

A. Nature of object B. Shape of the object (✓) C. Speed D. All

16. Friction is useful for us, how?

A. It helps us in walking
B. To apply brakes
C. To run machines and motors
D. All (✓)

17. Four students were asked to arrange the forces due to static friction, rolling friction and sliding friction in decreasing order?

A. Rolling, sliding, static

B. Rolling, Static, sliding

C. Static, sliding, rolling **(✓)**

D. Sliding, static, rolling

18. It is difficult to walk on ice because of less _____?

A. Gravitational force

B. Frictional force **(✓)**

C. Weight of ice

D. None

19. Why tyres are made circular?

A. Because rolling friction is less than sliding friction **(✓)**

B. To look beautiful

C. Because rolling friction is more than sliding friction

D. None

20. Soles of our shoes wear out because of _____?

A. Running

B. Slow moving

C. Friction **(✓)**

D. None

CHAPTER- 16 LIGHT

Question 1. Suppose you are in a dark room. Can you see objects in the room? Can you see objects outside the room. Explain.

Answer- We can see objects only if light from any source enter our eyes. If we are in a dark room, then it is not possible for us to see objects in the room. However, if there is light outside the room, then objects outside the room are visible to us.

Question 2. Differentiate between regular and diffused reflection. Does diffused reflection mean the failure of the laws of reflection?

Answer-

Regular Reflection	Diffused Reflection
1. It occurs from shiny and smooth surface.	1. It occurs from unpolished and rough surfaces.
2. Reflected rays are parallel to each other.	2. Reflected rays are parallel not to each other.

The laws of reflection have not failed even in diffused reflection, because each ray obeys the law of reflection.

Question 3. Mention against each of the following whether regular or diffused reflection will take place when a beam of light strikes. Justify your answer in each case.

(a) Polished wooden table.

Answer- Regular reflection will take place as the surface is smooth.

(b) Chalk powder.

Answer- Diffused reflection will take place as the surface is not smooth.

(c) Cardboard surface.

Answer- Diffused reflection will take place as the surface is not smooth.

(d) Marble floor with water spread over it.

Answer- Regular reflection will take place as the surface is smooth.

(e) Mirror.

Answer- Regular reflection will take place as the surface is smooth.

(f) Piece of paper.

Answer- Diffused reflection will take place as the surface is not smooth.

Question 4. State the laws of reflection.

Answer- Laws of reflection:

(i) The angle of reflection is always equal to the angle of incidence.

(ii) The incident ray, the reflected ray and the normal at the point of incidence, all lie in the same plane.

Question 5. Describe an activity to show that the incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.

Answer- Fix a white sheet of paper on a drawing board or a table. Let the sheet project a little beyond the edge of the table. Make a ray of light by passing torch light through a comb with all its openings closed except one in the middle. Place a strip of plane mirror in the path of the light ray. After striking the mirror, the ray of light is reflected in another direction. This is called the reflected ray. Now, cut the projecting portion of the sheet in the middle. Look at the reflected ray. Bend that part of the projected portion on which the reflected ray falls. The reflected ray that fell along this part can no longer be seen. This shows that the incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.

Question 6- Fill in the blanks in the following.

(a) A person 1 m in front of a plane mirror seems to be **2 m** away from his image.

(b) If you touch your **left** ear with right hand in front of a plane mirror it will be seen in the mirror that your right ear is touched with **left hand.**

(c) The size of the pupil becomes **large** when you see in dim light.

(d) Night birds have **less** cones than rods in their eyes.

Choose the correct option in Questions 7 – 8

Question 7. Angle of incidence is equal to the angle of reflection.

(a) **Always (✓)** (b) Sometimes (c) Under special conditions (d) Never

Question 8. Image formed by a plane mirror is:

(a) virtual, behind the mirror and enlarged.

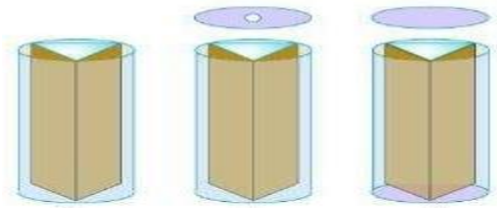
(b) virtual, behind the mirror and of the same size as the object. (✓)

(c) real at the surface of the mirror and enlarged.

(d) real, behind the mirror and of the same size as the object.

Question 9. Describe the construction of a kaleidoscope.

Answer- Take three rectangular mirror strips of dimensions 15cm x 4cm and join them together to form a prism. A prism is fixed into a circular cardboard tube. This circular tube is now closed at one end with a cardboard disc. This disc has a hole through which we can see. At the other end of the circular tube, a plane glass plate is fixed. On this glass plate, several small and broken pieces of coloured glass are placed. This end is now closed by a round glass plate allowing enough space for the coloured glass pieces to move.



Question 10- Draw a labelled sketch of the human eye.

Answer-

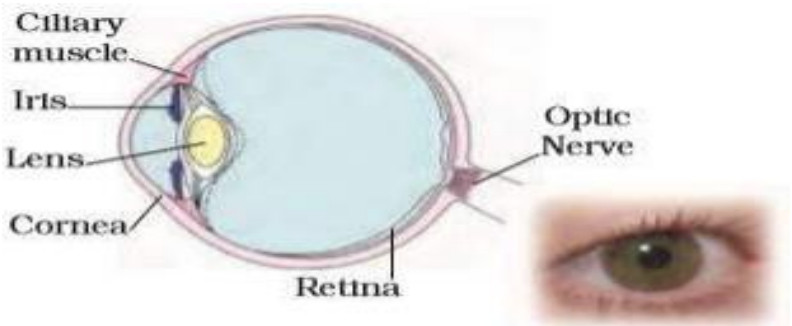


Fig. 16.14 : Human eye

Question 11. Gurmit wanted to perform Activity 16.8 using a laser torch. Her teacher advised her not to do so. Can you explain the basis of the teacher's advise?

Answer- Because of the intensity of the laser light is very high, and it is harmful to the human eyes. It can cause damage to the retina and leads to blindness.

Question 12- Explain how you can take care of your eyes.

Answer- (i) Visit an eye specialist regularly.

(ii) Avoid reading in dim light and very bright light.

(iii) Avoid direct exposure of sunlight to the eye.

(iv) Clean your eyes with cold water quickly if dust particles or small insects enter your eye.

(v) Do not rub your eyes.

(vi) Maintain a distance of at least 25 cm between the book and your eyes while reading.

Question 13- What is the angle of incidence of a ray if the reflected ray is at an angle of 90° to the incident ray?

Answer- 45º.

Question 14- How many images of a candle will be formed if it is placed between two parallel plane mirrors separated by 40 cm?

Answer- Infinite number of images.

Question 15- Two mirrors meet at right angles. A ray of light is incident on one at an angle of 30° as shown in Fig. 16.19. Draw the reflected ray from the second mirror.

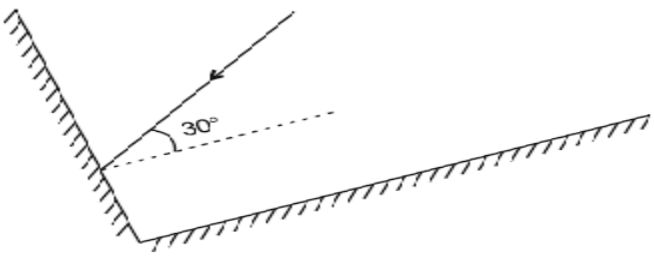
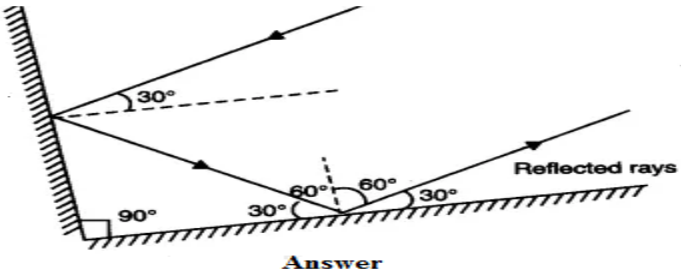


Fig. 16.19



Answer

Question 16- Boojho stands at A just on the side of a plane mirror as shown in Fig. 16.20. Can he see himself in the mirror? Also can he see the image of objects situated at P, Q and R?

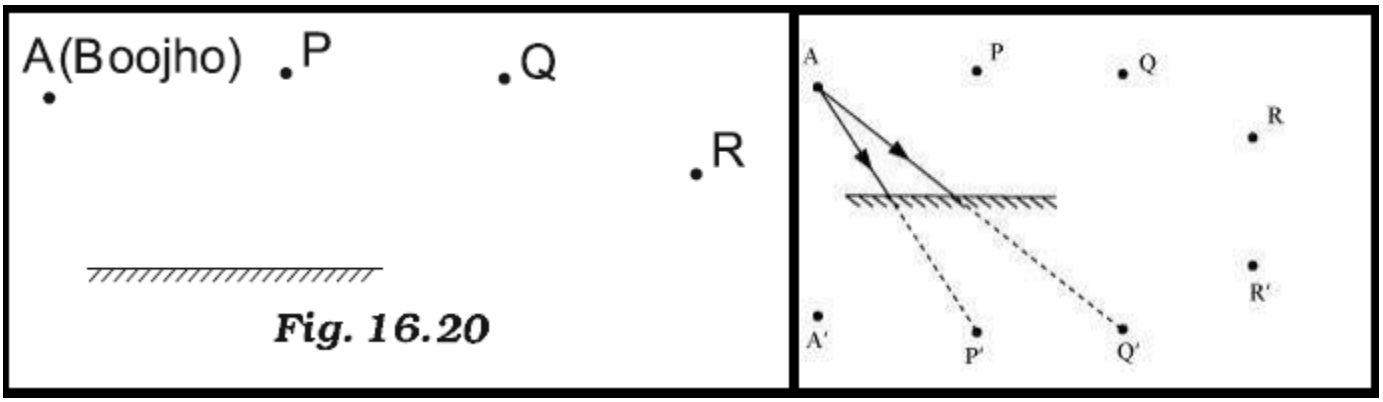


Fig. 16.20

Answer- A plane mirror forms a virtual image at same distance behind the mirror. A cannot see his image because the length of the mirror is too short on his side. However, he can see the objects placed at points P and Q, but cannot see the object placed at point R as shown in figure.

Question 17- (a) Find out the position of the image of an object situated at A in the plane mirror (Fig. 16.21).

(b) Can Paheli at B see this image?

(c) Can Boojho at C see this image?

(d) When Paheli moves from B to C, where does the image of A move?

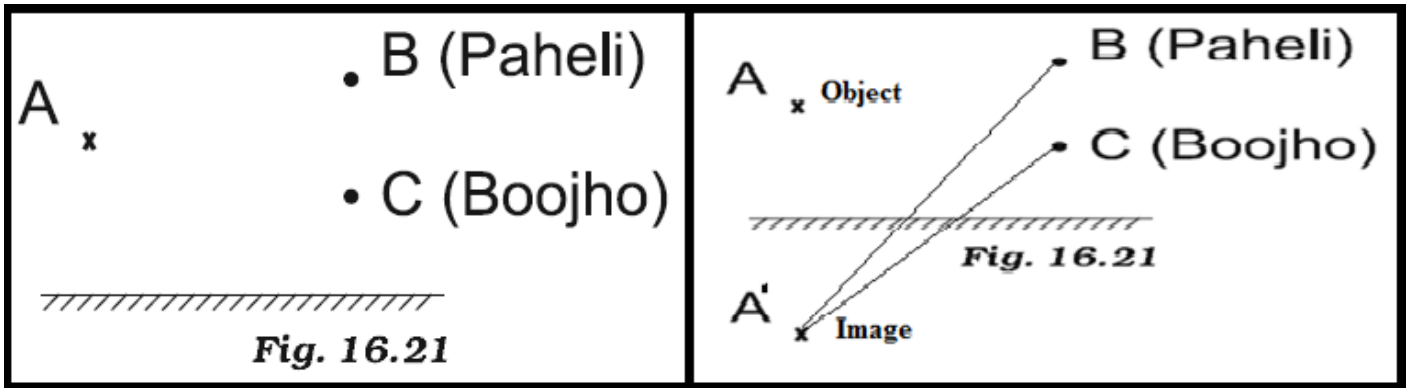


Fig. 16.21 Fig. 16.21

Answer- a) Image of an object placed at A is formed behind the mirror at the same distance.

b) Yes Paheli at B can see this image.

c) Yes Boojho at C can see this image.

d) Image of the object at A will not move.