

# Sample Paper

Max. Marks: 80

Duration: 3 hours

## General Instructions:

- (i) The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
- (ii) (Section-A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.
- (iii) Section-B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should be in the range of 30 to 50 words.
- (iv) Section-C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.
- (v) Section-D - question no. 34 to 36 are long answer type questions carrying 5 marks each. Answers to these questions should be in the range of 80 to 120 words.
- (vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (vii) Wherever necessary, neat and properly labelled diagrams should be drawn.

## Section-A

1. A green layer is gradually formed on a copper plate left exposed to air for a week in a bathroom. What could this green substance be?

OR



Explain why the element carbon forms a very large number of compounds.

2. Graphite is one of the allotropes of carbon. Unlike diamond, it is an electrical conductor and a good lubricant. Graphite is a good conductor of electricity due to the presence of \_\_\_\_\_.  
A. Lone pair of electrons                      B. Anions  
C. Cations    D. Free valence electrons
3. A convex mirror has a focal length  $f$ . A real object is placed at a distance  $f$  in front of it. The mirror produces an image at:  
A. infinity    B.  $f$   
C.  $\frac{f}{2}$     D.  $2f$
4. State whether the following statement is true or false:  
The axis of earth's imaginary magnet and the geographical axis coincide with each other.
5. Name the device which is used to reverse the direction of current in the coil of a motor.
6. What is the nature of image formed by a concave mirror if the magnification produced by the mirror is  
(a) + 4, and (b) - 2?

**OR**

State whether the following statement is true or false:

*Refraction occurs because light speeds up in denser materials.*

7. When is the force experienced by a current-carrying conductor placed in a magnetic field largest?
8. If 20 C of charge pass a point in a circuit in 1 s, what current is flowing?
9. Name two types of cells in the retina of an eye which respond to light.

**OR**

What type of reactions occurring inside the sun produces solar energy?

10. In a food chain, the third trophic level is always occupied by:  
A. Carnivores    B. Herbivores  
C. Decomposers    D. Producers
11. Name the ultimate source of energy in the biosphere.

**OR**



Name the first scientist who studied the inheritance of traits from one generation to the next.

12. Most of the plants reproduce by sexual method. Name two plants which can reproduce asexually.

**OR**

The nutritive tissue that ensures proper development of an embryo of the pea plant is known as \_\_\_\_\_.

13. How will you test for the gas which is liberated when hydrochloric acid reacts with an active metal?
14. Assertion: Magnetic field interacts with a moving charge and not with a stationary charge.

Reason: A moving charge produces a magnetic field.

- A. Both assertion and reason are true and the reason is the correct explanation of the assertion.
- B. Both assertion and reason are true but reason is not the correct explanation of the assertion.
- C. Assertion is true but reason is false.
- D. Assertion is false but reason is true.
15. Assertion (A) - Papaya is a unisexual plant.

Reason (R) - The flower of Papaya plants bear both male and female reproductive parts.

- (A) If both assertion and reason are CORRECT and the reason is the CORRECT explanation of the assertion.
- (B) If both assertion and reason are CORRECT, but the reason is NOT THE CORRECT explanation of the assertion.
- (C) If the assertion is CORRECT, but the reason is INCORRECT
- (D) If the assertion is INCORRECT, but the reason is CORRECT
16. The questions below consist of statements of an Assertion and a Reason. use the following key to choose the appropriate answer:
- ASSERTION: Colour of copper sulphate does not change when an iron nail is kept in it.
- REASON: Iron is more reactive than copper and it displaces it.
- (A) If both assertion and reason are CORRECT and the reason is the CORRECT explanation of the assertion.
- (B) If both assertion and reason are CORRECT, but the reason is NOT THE CORRECT explanation of the assertion.



(C) If the assertion is CORRECT, but the reason is INCORRECT

(D) If the assertion is INCORRECT, but the reason is CORRECT

17. Read the following and answer any four questions from 17 (i) to 17 (v)

The population growth rate has rapidly increased in the past few decades, resulting in a huge load on the natural resources. Topping over it is the increasing greed of human beings for the limited resources; so much so that no one is thinking about the sustainable development of these resources. To get access to more agricultural land, forests are being cleared off rapidly, which have their own repercussions on nature.

17 (i) The uprooting of forest trees to make way for more utilization of land is known as \_\_\_\_\_.

17 (ii) Trees are an important resource that should be conserved to mitigate the harmful effects of climate change because:

A. They provide us timber

B. They provide us pulp to manufacture paper

C. They give out oxygen

D. They absorb carbon dioxide

17 (iii) The protective Ozone layer is present in which layer of the atmosphere?

A. Stratosphere

B. Troposphere

C. Ionosphere

D. Lithosphere

17 (iv) Ozone molecules are formed by the union of

A. Two oxygen gas molecules

B. Two oxygen atoms and one oxygen gas molecule

C. Three Oxygen molecules

D. One oxygen gas molecule and one oxygen atom.

17 (v) The United Nations Environment Programme (UNEP) succeeded in forging an agreement to freeze \_\_\_\_\_ production at 1986 levels.

18. Read the following and answer any four questions from 18 (i) to 18 (v)

The release of energy in this aerobic process is a lot greater than in the anaerobic process. Sometimes, when there is a lack of oxygen in our muscle cells, another pathway for the break-down of pyruvate is



taken. Here the pyruvate is converted into lactic acid which is also a three-carbon molecule.

- 18 (i) Products of Glycolysis in cytoplasm include \_\_\_\_\_ and \_\_\_\_\_.
- 18 (ii) The site of Glycolysis in the cell is:
- |                 |              |
|-----------------|--------------|
| A. Mitochondria | B. Cytoplasm |
| C. Chloroplast  | D. Vacuole   |
- 18 (iii) In the yeast cells, the pyruvate is converted into how many products?
- 18 (iv) Muscle cramps in the athletes is due to accumulation of \_\_\_\_\_ in the muscle cells
- 18 (v) Complete Cellular respiration of glucose to give 38 ATP in Human cheek cells will take place in
- |                   |                               |
|-------------------|-------------------------------|
| A. Cytoplasm only | B. Mitochondria only          |
| C. Both A and B   | D. Cheek cells do not respire |

19. Read the following and answer any four questions from 19 (i) to 19 (v)

Sonia purchased a packet of potato chips from the shop. She opened the packet and ate some of the chips and left the packet as such in one corner of her study room. After a gap of about two weeks, she saw the packet and wanted to do so munching again. At that time, her elder sister Pallavi, a science student of class eleven was present in her room. She found that a foul smell was coming out from the packet. She immediately threw it in the dustbin and did not allow her sister to eat the chips.

1. Why did potato chips develop foul smell?
  2. What was the cause of the spoilage of the chips?
  3. What is the nature of the chemical reaction involved in it?
  4. Why do not sealed packets develop foul smell even if kept for months?
  5. Name the gas that is to be added in the sealed packets of potato chips.
20. Question numbers 20(a) to 20(e) are based on the table related to the values of absolute refractive index of different material mediums. Study the table and answer the questions on the basis of your understanding of the following paragraph and the related studied concepts.



Material Medium	Refractive Index	Material Medium	Refractive Index
Air	1.0003	Canada Balsam	1.53
Ice	1.31		
Water	1.33	Rock salt	1.54
Alcohol	1.36		
Kerosene	1.44	Carbon disulphide	1.63
Fused quartz	1.46	Dense flint glass	1.65
Turpentine oil	1.47	Ruby	1.71
Benzene	1.5	Sapphire	1.77
Crown glass	1.52	Diamond	2.42

- (a) Name the medium having highest optical density.
- (b) Find the medium with lowest optical density.
- (c) You are given kerosene, turpentine and water. In which of these does the light travel fastest?
- (d) In which of the mediums mentioned in table does the light travel slowest?
- (e) What is the relative refractive index of Kerosene with respect to the dense flint glass?

### Section-B

21. Write the dual purposes served by urethra in males.

**OR**

List a few modes of spreading AIDS.

22. What is observed when a solution of potassium iodide solution is added to a solution of lead nitrate? Name the type of reaction. Write



a balanced chemical equation to represent the above chemical reaction.

23. What is an alloy? State the constituents of solder. Which property of solder makes it suitable for welding electrical wires?
23. Name the natural source of each of the following acid
- |                   |                    |
|-------------------|--------------------|
| (i) Citric acid   | (ii) Oxalic acid   |
| (iii) Lactic acid | (iv) Tartaric acid |
24. The magnification produced by a plane mirror is + 1. What does this mean?
25. (i) Calculate the work done in moving a charge of 5 coulombs from a point at 20 to another at 30 V.  
(ii) With the help of scattering of light, explain the reason for the difference in colors of the sun as it appears during sunrise/sunset and noon.
26. What happens to the force experienced by a current carrying conductor placed in a uniform magnetic field, when placed
- (a) parallel to magnetic field?  
(b) perpendicular to magnetic field?

### Section-C

27. What are the methods used by plants to get rid of excretory products.
- OR**
- (i) Name the carrier of heredity.  
(ii) Mention the practical utility of genetics.
28. What is the function of the trachea? Why do its walls not collapse even when there is less air in it?
29. How is being a vegetarian advantageous in terms of energy?
30. State the type of chemical reactions and chemical equations that take place in the following:
- (i) Magnesium wire is burnt in air.  
(ii) Electric current is passed through water.  
(iii) Ammonia and hydrogen chloride gases are mixed.
31. (a) Explain Ionic compounds in general have high melting and boiling points.



- (b) How many covalent bonds are there in a molecule of ethane?  
(c) What are 'groups' and 'periods' in the 'periodic table'?
32. (a) Did Mendeleev have placed some gaps in his periodic table?  
(b) List any three limitations of Mendeleev's classification.
33. A 2.0 cm tall object is placed perpendicular to the principal axis of a concave lens of focal length 15 cm. At what distance from the lens, should the object be placed so that it forms an image 10 cm from the lens? Also find the nature and the size of image formed.

### Section-D

34. Draw a labelled diagram of the human female reproductive system. With the help of this diagram, explain the working of the human female reproductive system.

OR

Draw a labelled diagram of the human male reproductive system. With the help of this diagram, describe the working of the human male reproductive system ?

35. (a) Define a balanced chemical equation. Why should an equation be balanced?  
(b) Write the balanced chemical equation for the following reactions:  
(i) Phosphorus burns in presence of chlorine to form phosphorus pentachloride.  
(ii) Burning of natural gas.  
(iii) The process of respiration.
36. (i) A wire of resistance  $20 \Omega$  is bent to form a closed square. What is the resistance across a diagonal of the square?  
(ii) A wire of given material having length  $l$  and area of cross-section  $A$ , has a resistance of  $2 \Omega$ . Find the resistance of another wire of same material having length  $2l$  and area of cross-section  $A/2$ .  
(iii) Is electric current a scalar or vector quantity? State the smaller unit of current.

OR

(a) What is "dispersion of white light"? Draw a labelled diagram to illustrate the recombination of the spectrum of white light. Why it is





essential that the two prisms used for the purpose should be identical and placed in an inverted position with respect to each other?

(b) Name the:

a. Component of white light that deviates the least.

b. Component of white light that deviates the most, while passing through a glass prism.

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## Hints & Solutions

### Section-A

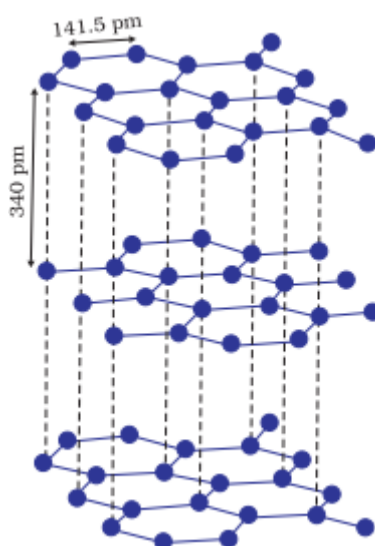
1. **Answer:** It is due to the formation of basic copper carbonate  $[\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2]$

**OR**

Carbon forms a large number of compounds since carbon is small in size and can form stable covalent bonds (catenation) and it shows tetravalency.

2. **Answer:** D

The graphite is a good conductor of electricity due to the presence of free valence electrons.



This property of graphite is due to the carbon atoms being arranged in different layers and each atom is covalently bonded on three of its neighboring atoms in the same layer. The fourth valence electrons of each atom are present between different layers and are free to move about. These free electrons in graphite make it a good conductor of electricity.

3. **Answer:** C

The focal length of a convex mirror is positive. And according to the question the object is kept at a distance  $f$  in front of the mirror ( $u$ )

Using the mirror formula;



$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

Substituting the value of v and u in the equation;

$$\frac{1}{v} + \frac{1}{(-f)} = \frac{1}{f}$$

$$\frac{1}{v} = \frac{1}{f} + \frac{1}{f}$$

$$\frac{1}{v} = \frac{2}{f}$$

$$v = \frac{f}{2}$$

The image is formed at a distance  $\frac{f}{2}$  from the mirror.

4. **Answer:** False

The two axis do not coincide with each other as they are separated by an angle of about  $17^\circ$ .

5. **Answer:** Commutator is used to reverse the direction of current in the coil of a motor.

6. **Answer:** (a) The nature of image formed by a concave mirror is Virtual and erect

(b) The nature of image formed by a concave mirror is Real and inverted

**OR**

False, the light as it enters the denser material slows down.

7. **Answer:** The force experienced by a current carrying conductor is largest when it is placed at right angle in a magnetic field.

8. **Answer:** The flow of electric charge is known as electric current. Here 20 C charge pass in a circuit in one second.

$$I = \frac{q}{t} = \frac{20}{1} = 20 A$$

9. **Answer:** The two types of cells in the retina of an eye which respond to light are Rods and Cones.

**OR**

Nuclear fusion reactions occur inside sun that produces solar energy. This reaction, converts hydrogen atoms into helium.

10. **Answer:** A

The first trophic level is occupied by producers and the second by herbivores. Third trophic level will comprise of the organisms who feed on the organisms of second trophic level. They are known as the secondary consumers or the carnivores.

11. **Answer:** The Sun.

**OR**

Gregor Johann Mendel

12. **Answer:** Rose (by Cuttings), *Bryophyllum* (by Leaf buds), Potato (by "eyes" or buds) and Jasmine (by Layering).

**OR**

Endosperm

13. **Answer:** Bring a burning matchstick near the gas. It burns with a 'pop' sound showing that it is hydrogen.

14. **Answer:** A

A moving charge experiences a force in magnetic field. It is because of interaction of two magnetic fields, one which is produced due to the motion of charge and other in which charge is moving.

15. **Answer:** C

A plant is known as a Unisexual one when it bears one type of sexual organs (either male or female reproductive organs) on its flowers.

16. **Answer:** D

Assertion is incorrect. Iron is more reactive, displaces Cu and forms ferrous sulphate which changes the colour.

17 (i) **Answer:** Deforestation

17 (ii) **Answer:** D

The climate change due to the excess of greenhouse gases in the atmosphere is the main cause of all the harmful effects seen around the world. Concentration of one of the major greenhouse gases, the carbon dioxide has increased manifolds and as the trees absorb the carbon dioxide for photosynthesis, its toxic concentrations can be reduced to sustainable levels. Hence, we should not cut the trees and conserve them.

17 (iii) **Answer:** A

The protective Ozone layer is present in the stratosphere layer of the atmosphere.

17 (iv) **Answer:** D

Ozone at the higher levels of the atmosphere is a product of UV radiation acting on oxygen ( $O_2$ ) molecules. The higher energy UV radiations split apart some molecular oxygen ( $O_2$ ) into free oxygen (O) atoms. These atoms then combine with the molecular oxygen to form ozone.

17 (v) **Answer:** Chlorofluorocarbons (CFCs)

18 (i) **Answer:** Products of Glycolysis in cytoplasm include Pyruvate and ATP.

18 **Answer:** B

Glycolysis is found in all the cells (be it prokaryotic or eukaryotic) and is observed in the cytoplasm.

18 (iii) **Answer:** 3 Products - Ethyl alcohol/ethanol,  $CO_2$  and ATP.

18 (iv) **Answer:** Lactic Acid

18 (v) **Answer:** C

Complete Cellular respiration to give 38 ATP in Human cheek cells will take place in two steps-

i) Glycolysis in the cytoplasm to yield two molecules of pyruvate and 2 ATPs from one molecule of glucose.

ii) Aerobic respiration in Mitochondria to yield  $CO_2$ ,  $H_2O$  and 36 ATPs from two molecules of pyruvate.

19. **Answer:**

1. Potato chips developed foul smell due to rancidity.

2. Potato chips contain some oil as well as fat. These were slowly oxidised since they were exposed to air and therefore, developed foul smell.

3. It is a type of oxidation reaction

4. The bags or packets containing chips or other such eatables are filled with nitrogen and then sealed.

5. Nitrogen gas is added in the sealed packets of potato chips.

20. **Answer:**

(a) The index of refraction value of a material is a number that indicates the number of times slower that a light wave would be in that material than it is in a vacuum.

So as the index of refraction value increases, the optical density increases, and the speed of light in that material decreases.

Hence, diamond has the greatest optical density.

(b) As explained in the previous problem, the substance with least refractive index will have the least optical density.

(c) The greater the refractive index, greater will be the optical density of the substance. And the speed of light will also decrease with the increase in the optical density.

The increasing order of the refractive index is

Water > Kerosene > Turpentine Oil.

Thus, the light will travel the slowest in the water.

(d) The greater the refractive index, greater will be the optical density of the substance. And the speed of light will also decrease with the increase in the optical density.

Therefore, the speed of light will travel the slowest in air.

(e) The relative refractive index is defined as follows;

$$\mu_{12} = \frac{\mu_1}{\mu_2}$$

Where  $\mu_1$  and  $\mu_2$  is the refractive indices of the substance 1 and 2 respectively.

Refractive index of Kerosene =  $\mu_1 = 1.47$

Refractive index of dense flint glass =  $\mu_2 = 1.65$

Thus,

$$\mu_{12} = \frac{1.47}{1.65} = 0.89$$

## Section-B

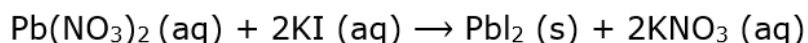
21. **Answer:** Human penis conducts urine as well as semen, but the two cannot pass at the same time.

**OR**

AIDS is an STD that can spread through:

- Unprotected copulation
  - Sharing of infectious needles
  - Transfusion of blood between a normal and infected person
  - It can also be transmitted from an infected mother to the the fetus.
22. **Answer:** Yellow precipitate of lead iodide is formed. It is a precipitation reaction.





It is also called double displacement reaction.

23. **Answer:** Alloy is a homogeneous mixture of two or more metals. One of them can be non-metal also. Solder consists of lead and tin. It has low melting point which makes it suitable for welding electrical wires

23. **Answer:** (i) Lemon and orange

(ii) Tomatoes and Guava

(iii) Sour milk (curd)

(iv) Tamarind

24. **Answer:** Given,

Magnification by plane mirror = 1

We know,

$$\text{magnification} = \frac{\text{height of image}}{\text{height of object}}$$

Substituting value of magnification in this formula:

$$1 = \frac{\text{height of image}}{\text{height of object}}$$

Height of object = Height of image

So, the given information signifies that image formed by a plane mirror is of same size as that of object.

Also,

$$\text{magnification} = - \frac{\text{image distance}}{\text{object distance}}$$

Substituting value of magnification in this formula:

$$1 = - \frac{\text{image distance}}{\text{object distance}}$$

Object distance = - Image distance

Or image distance = - Object distance

So, the given information also tells that image formed by a plane mirror is at same distance behind the mirror as the object is in front of the mirror i.e. virtual and erect image.

25. **Answer:** (i) Given;



Charge (Q) = 5C;

Potential difference = 30 – 20 = 10V;

Work done = Charge × Potential difference

⇒ Work done = 5 × 10 = 50 J.

Hence the work done is 50 Joule.

(ii) When there is sunrise or sunset the sun is near the horizon, so the light rays have to cover large distance and hence the blue colour scatters away and far from earth but the red colour scatters near the earth and lesser than blue colour because red has maximum wavelength.

At noon the sun is at least possible distance from earth, so the blue colour scatters very less due to that distance and hence we see sun as white in colour, and as blue has minimum wavelength, so the rest of the colors would also not get scattered.

26. **Answer:** Whenever a current carrying conductor is placed in a uniform magnetic field. It will experience a magnetic force. However, the magnetic force depends on various parameters. Hence the magnetic force depends on four things:

- Amount of current
- Strength of Magnetic field
- Length of the wire which remain in magnetic field
- And the angle between the current carrying conductor and magnetic field.

The most important criteria here is the angle between the current carrying conductor and the magnetic field. If the angle is 0° or 180° then there will be no force acting on the wire. But if the angle is 90° the force will be maximum. If you observe the pattern it goes on like that, at 0° the force is 0 but as the angle increases the force increases and at 90° the force reaches its maximum value. And then again it starts decreasing and it becomes 0 at 180°. Hence,

(a) parallel to magnetic field

When the current carrying wire is placed parallel or anti-parallel to the magnetic field the magnetic field does not act on it.

(b) perpendicular to magnetic field

When the current carrying conductor is placed perpendicular to the magnetic field then magnetic force acting on conductor is maximum.

### Section-C





27. **Answer:** Plants get rid of their excretory wastes by the following methods:

1. Excess water is removed by the process of transpiration.
2. Some of the intracellular waste may get stored in the vacuole or in the leaves which later on are shed.
3. Resins and gum are stored in specific resin vacuole or also in xylem.
4. Salts and some other by products move out of the stomata by the process of diffusion.
5. Dead bark is the dead phloem cells that later act as protective covering also called the "rhytidome"

**OR**

i) Gene or the functional segment of the DNA is the carrier of heredity. Genes are present on the chromosomes which code for different characters. Genes play a very important role in passing the information from one generation to another.

ii) Genetics is used for sex determination in humans. E.g.- It is important in finding the parent of the child as the child will have one set of similar genes as that of parents. It is also useful in predicting the genetic disorders that a progeny may inherit from the parents.

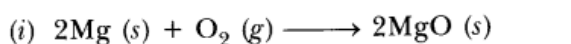
28. **Answer:** Trachea is an 11 cm long and hollow tube that opens into laryngopharynx through its opening called "glottis). The inner wall of Trachea contains Mucus glands and cilia, this Mucus keeps the lumen of Trachea moist and cilia pushes the Mucus and dust away from lungs.

Trachea has "C-shaped" cartilaginous rings on its outer wall. These rings prevent the collapsing of the Trachea when there is less air in it.

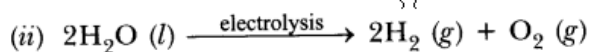
29. **Answer:** Being a vegetarian will increase the amount of energy taken up by your body. As we know that energy decreases at each successive trophic level. It is least available for the last trophic level. Humans are the final (tertiary) consumers of any food chain; hence if they skip the primary and secondary consumers and directly feed on plants, then they can have the more amount of energy comparative to the energy if they don't skip.

30. **Answer:**

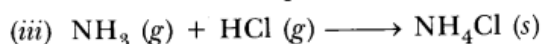




Combination reaction (Redox reaction).



Electrical decomposition reaction.



Combination reaction.

31. **Answer:** (a) Ionic compounds have high melting and boiling points due to strong force of attraction between oppositely charged ions.

(b) There are 7 covalent bonds in a molecule of ethane.

(c) The vertical columns in the periodic table are called 'groups'. The horizontal rows in the periodic table are called 'periods'.

32. **Answer:** (a) Gaps were left for undiscovered elements in the Mendeleev's Periodic Table.

(b) Three limitations of Mendeleev's classification:

(i) Position of hydrogen was not justified.

(ii) Increasing order of atomic mass could not be maintained.

(iii) Isotopes have similar chemical properties but different atomic masses, they cannot be given separate places.

33. **Answer:** According to the question;

Object distance =  $u$ ;

Image distance ( $v$ ) =  $-10\text{cm}$ ;

Focal length =  $-15\text{cm}$ ;

By lens formula;

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

$$\Rightarrow \frac{1}{-10} - \frac{1}{u} = \frac{1}{-15}$$

$$\Rightarrow \frac{1}{u} = \frac{1}{15} - \frac{1}{10}$$

$$\Rightarrow \frac{1}{u} = \frac{2-3}{30} = \frac{-1}{30}$$

$$\Rightarrow \frac{1}{u} = \frac{-1}{30}$$

$$\Rightarrow u = -30\text{cm}.$$

Thus, object should be placed  $30\text{cm}$  in front of lens.

Now;

Height of object  $h_1 = 2\text{cm}$ ;

Magnification,

$$\frac{h_1}{h_2} = \frac{v}{u}$$

Putting values of  $v$  and  $u$

Magnification,

$$\frac{h_2}{2} = \frac{-10}{-30}$$

$$\frac{h_2}{5} = \frac{1}{3};$$

$$h_2 = \frac{5}{3} = 1.67$$

Height of image is 1.67 cm.

Thus, the image is virtual, diminished, and erect and one-third of the size of object.

## Section-D

34. **Answer:** The human female reproductive system consists of:

(i) Ovaries - These are the primary reproductive organs in women. They are oval shaped and present inside the abdominal cavity of a woman. The ovaries produce ova or female gametes and sex hormones called Estrogen and Progesterone.

(ii) Fallopian tubes (or Oviducts) - These are paired tubes which have funnel shaped openings that cover the ovaries. The ovum released by an ovary goes into the oviduct through its funnel shaped opening. The fertilisation of egg by a sperm takes place in it.

(iii) Uterus - It is an elastic bag- like structure in which the fertilised egg develops into a baby. The uterus opens into the vagina through the cervix.

(iv) Vagina - It is a tubular structure. It receives the sperms for the fertilisation. It is also called the birth canal because it is the passage through which the baby is born.





*Human Female Reproductive System*

**OR**

The human male reproductive system consists of:

(i) Testes – These are main reproductive organs in male. They are located outside the abdominal cavity in scrotum. The testes produce male germ cells called sperms. It also produces male sex hormones called testosterone.

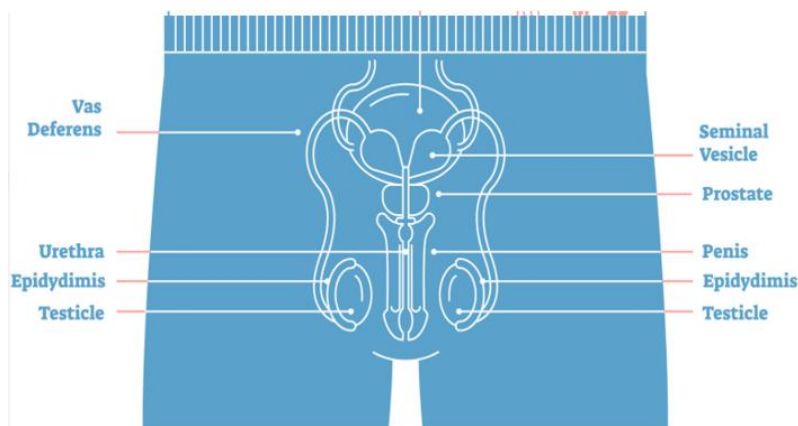
(ii) Scrotum – It is a muscular pouch which houses the testes. It is present outside the abdominal cavity and maintains a lower temperature than the normal body temperature.

(iii) Epididymis – It is a coiled tube which stores the sperms temporarily.

(iv) Vas Deferens - It is a long tube which carries the sperms from epididymis to another tube called urethra.

(v) Seminal vesicles and prostate gland – The secretion of seminal vesicles and prostate glands pass out along with sperms. These secretions provide a fluid medium for the movement of sperms.

(vi) Penis - It is an organ which passes the sperms from the man's body into the vagina in the women's body during mating.

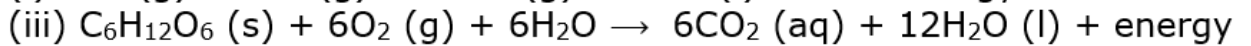
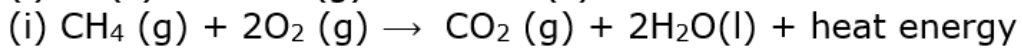
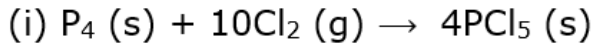


*Human Male Reproductive System*

35. **Answer:** (a) Balanced chemical equation has an equal number of atoms of different elements in the reactants and products.

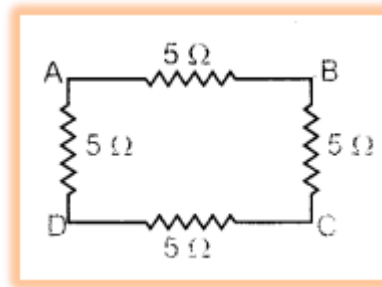
According to the law of conservation of mass, matter can neither be created nor be destroyed in a chemical reaction.

(b)



36. **Answer:**

(i) Since the wire is bend in form of the square and we know that sides of square are equal so each side will have same resistance i.e 5 ohm. Now if we make diagonal two faces in each side of the diagonal will have two sides and resistance will be 10 Ω. As shown below.



So total resistance will be

$$\frac{1}{R_{eq}} = \frac{1}{10} + \frac{1}{10} = \frac{2}{10}$$

$$R_{eq} = 5 \text{ ohm}$$

Hence, the equivalent resistance is 5 Ω.

(ii) Given

$$\text{Resistance } (R) = 2\Omega$$

$$\text{Area of cross-section} = A$$

$$\text{Length} = l$$

We know that

$$R = \rho \frac{l}{A}$$

$$2 = \rho \frac{l}{A} \dots \dots \dots (1)$$

New Area =  $A/2$

New Length =  $2l$

New Resistance =  $R'$

$$R' = \rho \frac{2l}{\frac{A}{2}}$$

$$R' = \rho \frac{4l}{A}$$

$$R' = 4\rho \frac{l}{A}$$

From (1) we can write,

$$R' = 4 \times 2 = 8.$$

Hence the new resistance will be four times the previous resistance i.e.  $8\Omega$ .

(iii) Electric current is a scalar quantity because it is the measure of how much charge flow through a particular area.

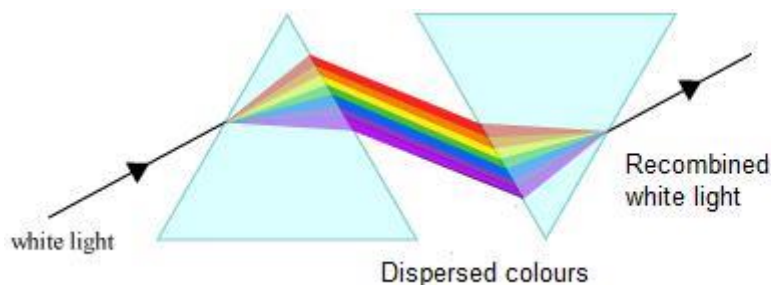
Smaller unit of current is Ampere denoted by A.

**OR**

The splitting of white light into seven colours on refraction is called dispersion of light.

The dispersion of white light occurs because colours of white light travel at different speeds through the glass prism. The amount of refraction depends on the speed of coloured light in glass.

The two prisms should be identical because if they are different, their refractive index would be different resulting in further dispersion and not recombination. If the prisms are identical then both have equal and opposite refractive index which would help in recombination. Prisms are inverted so that from first prism the lights will get diverged and from the second it will converge.



(b) The visible spectrum of light consists of 7 colours. These are mentioned along with the wavelength as below:

Color	Wavelength
Violet	380–450 nm
Blue	450–495 nm
Green	495–570 nm
Yellow	570–590 nm
Orange	590–620 nm
Red	620–750 nm

a. As the red colour has the maximum wavelength, it will deviate the least. It has less velocity, and thus deviated the least.

b. As the violet colour has the minimum wavelength, it will deviate the most.

Small wavelengths have larger velocity due to which it is deviated the most.

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