Sample Paper
Class 10 CBSE 2020-21

Time Allowed :3Hours **Maximum marks:80**

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 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 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. Answer 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. Students have to attempt only one of the alternatives in such questions.

(vii) Wherever necessary, neat and properly labelled diagrams should be drawn.

Section-A

1. Why does Calcium float on water?

   (OR)

   Name two metals which are found in nature in the free state.
2. When air is blown from mouth into a test tube containing lime water, the lime water turned milky due to the presence of:
   A. oxygen
   B. carbon dioxide
   C. nitrogen
   D. water vapour
3. The force experienced by a current-carrying conductor placed in a magnetic field is the largest when the angle between the conductor and the magnetic field is:
   A. 45°
   B. 60°
   C. 90°
   D. 180°
4. What condition is necessary for the production of current by electromagnetic induction?
5. State the factors on which the strength of electric current flowing in a given conductor depends.
6. What is the nature of a mirror having a focal length of, +10 cm?

   OR

   Describe the nature of image formed when an object is placed at a distance of 30 cm from a convex lens of focal length 15 cm.
7. State two effects produced by the scattering of light by the atmosphere.
8. An electric lamp is labeled 12 V, 36 W. This indicates that it should be used with a 12 V supply. What other information does the label provide?
9. Why are the coils of electric irons and electric toasters made of an alloy rather than a pure metal?

   OR

   Give two reasons why different electrical appliances in a domestic circuit are connected in parallel.
10. Various steps in a food chain represent:
    (a) Food web
    (b) Trophic level

(c) Ecosystem
(d) Biomagnification

11. What is fertilization? Where does it occur in a human female?

OR

What is micturition?

12. Where does aerobic respiration occur in a cell?

OR

List two functions of the ovary of the human female reproductive system.

13. Mention the respiratory unit of lungs and excretory unit of kidneys.

A-R Type Questions

DIRECTIONS: Each of these questions contains an Assertion followed by Reason. Read than carefully and answer the question on the basis of following options. You have to select the one that best describes the two statements.

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.

14. Assertion: Wire A is thin in comparison to wire B of same material and same length, then resistance of wire A is greater than resistance of wire B.
Reason: R: Resistivity of wire A is greater than resistivity of wire B.

15. Read the statements given below and choose the correct option.
Statement I: Non-metals react with oxygen to form acidic oxides.
Statement II: Nitrogen being a non-metal reacts with oxygen in the atmosphere to form oxides of nitrogen at the normal conditions of temperature and pressure.
    A. Statement-I is correct but statement-II is incorrect
    B. Both statements are correct
    C. Statement-I is incorrect but statement-II is correct
    D. Both statements are incorrect

16. Assertion (A): Surgical methods are the most effective methods of contraception.
    Reason (R): Surgical method blocks gametes transport and hence prevent fertilization
17. Read the given passage and answer any four questions.
    Sanjana is suffering from frequent stomach pain and vomiting. She went to the Doctor. The doctor asked her to go for an ultrasound. In the report, a stone was found in her gallbladder. Doctor asked her to remove the gallbladder by operation. But she was reluctant to go for the Operation.

(a) The role played by gall bladder in human body is
    (i) To store bile
    (ii) To secrete bile
    (iii) To emulsify fats
    (iv) To digest fats

(b) Removal of gall bladder
    (i) affects the person's health
    (ii) Has no effect on the person’s health
    (iii) Effects the secretion of bile
    (iv) Effects the digestion of proteins

(c) Which of the following statements is correct about bile?
    (i) It helps in emulsification of fat.
    (ii) It helps in digestion of carbohydrates
    (iii) It helps in absorption of digested food.
    (iv) It helps in egestion of undigested food.

(d) Which part of the alimentary canal receives bile from the liver?
    (i) Stomach
    (ii) Small intestine
    (iii) Large intestine
    (iv) Oesophagus

(e) What is the function of bile salt in the intestine?
    (i) Activator of lipase
    (ii) Emulsifier
    (iii) Cofactor of cholesteryl esterase
    (iv) Inhibitor of lipid absorption

18. Answer any four question (a)-(e) based on the paragraph given below:
Mendeleev realized that the physical and chemical properties of elements were related to their atomic mass in a 'periodic' way, and arranged them so that groups of elements with similar properties fell into vertical columns in his table. He was also able to work out the atomic mass of the missing elements, and so predict their properties. He also left the gaps for the elements to be discovered later. At present 118 elements are known to exist in nature but at the time of Mendeleev, less elements were studied.
    (a) The position of which element is not fixed in Mendeleev's periodic table?
    (b) According to Mendeleev, elements are periodic function of their _____.
    (c) How many elements were studied by Mendeleev?
    (d) In Mendeleev 's Periodic Table, gaps were left for the elements to be discovered later. Which elements found a place in the periodic table later?
    (e) What Mendeleev had done for the undiscovered elements?
19. Answer any four question (a)-(e) based on the paragraph given below:
Tooth enamel, made up of calcium phosphates, is the hardest material in our body. It does not dissolve in water. It gets corroded at pH below 5.5, i.e., in moderately acidic conditions. The bacteria produce acid during the degradation of sugar and the food particles left behind after meals. This acid corrodes the teeth. To prevent tooth decay, one should brush teeth properly after each meal. Another way to prevent tooth decay is to avoid eating sugary foods.
    (a) What is the enamel on your teeth made of?
    (b) What is the nature of calcium phosphate present in tooth enamel?
    (c) At what pH teeth gets corroded?
    (d) What is the hardest material in our body?
    (e) How can one prevent tooth decay?
20. Question numbers 20(a) to 20(d) is based on the table related to the values of current I, flowing in a given resistor for the corresponding values of potential difference V across the resistor.
Ohm's law enunciates the linear variation of current on linear change brought in the potential impressed across the conductor. The resistance of a conductor is determined to remain constant provided its temperature

stays stagnant during the experiment. The resistance of an object also depends on temperature, since R_0 is directly proportional to ρ (resistivity). For a cylinder shaped resistor we know, $R = \rho \frac{l}{A}$. If so, if L and A do not change greatly with temperature, R will have the same temperature dependence as ρ.

The expression that governs the change in the resistance due to the varying temperature is as follows: -

$$R = R_0(1 + \alpha \Delta T)$$

Where R_0 is the original value of resistance; ΔT is the change in temperature and α is the coefficient of linear expansion.

An experiment is conducted to determine the resistance of a cylindrical shaped copper conductor by varying the voltages across it. The observation is recorded in the table mentioned below. Study the table and answer the questions that follow:

{$\rho_{copper} = 1.72 \times 10^{-8}$; $\alpha_{copper} = 3.9 \times 10^{-3}$}

Voltage (V)	0.5	1.0	2.0	3.0	4.0
Current (I)	1.85	3.70	7.40	11.10	15.0

(a) Calculate the resistance of the resistor. Comment on whether the conductor is an ohmic or non-ohmic conductor?

(b) What type of curve you will obtain if you plot the above values of I and V?

(c) What will be the value of new resistance if the temperature of the wire specimen is increased from room temperature (20ºC) to a typical operating temperature of 2850ºC?

(d) Name any one safety you will prefer while doing the experiment to record the values given in the table.

Section-B

21. List four methods of contraception used by humans?

OR

Name one nitrogenous waste present in urine. What is the basic filtration unit of the kidney called?

22. What is DNA copying? State its importance.

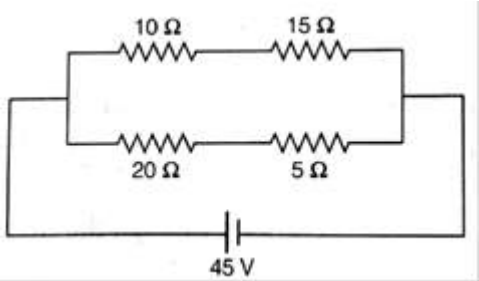
23. (a) Write the electron dot structures for potassium and chlorine.
    (b) Show the formation of KCl by the transfer of electrons.

(OR)

A shiny brown coin made up of an element turned black on heating. What was the element of the coin and what is the black compound formed?

24. State what would happen to the direction of rotation of a motor if:
    (i) the current was reversed
    (ii) the magnetic field were reversed
    (iii) both current and magnetic field were reversed simultaneously

25. In the circuit shown below, calculate the net resistance of the circuit.



26. What is meant by refractive index? If the speed of light in a medium is $\frac{2}{3}$rd of the speed of light in vacuum, find the refractive index of that medium.

Section-C

27. (a) Why did Mendel choose garden pea for his experiments? Write two reasons.
    (b) List two contrasting visible characters of garden pea Mendel used for his experiment.

OR

Write the functions of the following parts of human female reproductive system:

28. (a) Budding, fragmentation and regeneration, all are considered as asexual mode of reproduction. Why?
    (b) With the help of neat diagrams, explain the process of regeneration in Planaria?

29. (a) Define excretion.
    (b) Name the basic filtration unit present in the kidney
30. (a) What are hydrated salts? Give three examples.
    (b) Define deliquescence. Name one compound which shows this property.

31. Give reason for the following:
    (a) Aluminum oxide is considered as an amphoteric oxide.
    (b) Ionic compounds conduct electricity in a molten state.
32. For making cake, baking powder is taken. If you use baking soda instead of baking powder in cake. How will it affect the taste of cake and why? How can baking soda be converted into baking powder?
33. (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) The image of an object place at 60 cm in front of a lens is obtained on a screen at a distance of 120 cm from it. Find the focal length of the lens. What would be the lens? What would be the height of the image? If the object is 5 cm high?

Section-D

34. Mention the organ and site of photosynthesis in green plants. What are the raw materials essential for this process? How are they obtained? Write a complete balanced chemical equation for the process. Name the by-products.

OR.

(i) Draw the diagram of cross section of a leaf and label the following parts:
    (a) chloroplast
    (b) cuticle

(ii) A gas is released during photosynthesis. Name the gas and also state the way in which the gas is evolved.

(iii) In certain groups of plants, stomata remain closed during the day. How is food synthesized by such plants ? Also name them.

35. (a) In the following set of elements, one element does not belong to the set. Select this element and explain why it does not belong: Magnesium, Sodium, Beryllium, Calcium
    (b) What were the limitations of Newland's law of octaves?
    (c) How were the positions of cobalt and nickel resolved in the modern periodic table?

36. Answer the following questions
    a. A stationary charge is place in a magnetic field. Will it experience a force? Give reason to justify your Answer:
    b. On what factors does the direction of force experienced by a conductor when placed in a magnetic field depend?
    c. Under what conditions is the force experienced by a current carrying conductor placed in a uniform magnetic field maximum?
    d. under what conditions is the force experienced by a current carrying conductor placed in a uniform magnetic field maximum?

OR

Explain why the direction of the induced current in the coil of an AC generator changes after every half revolution of the coil.

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Solutions

Section-A

1. Answer: When calcium reacts with water, it forms hydrogen gas. The reaction is given below:

$$Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$$

The bubbles of hydrogen gas produced in the reaction get stick to the surface of the metal. Hence, calcium floats on water.

(OR)

Answer: Gold and platinum are found in nature in the free state.

2. Answer: B

We exhale carbon dioxide, so when air is blown from the mouth, i.e., carbon dioxide, into a test tube that contains lime water, the lime water turns milky due to presence of carbon dioxide. Carbon dioxide turns lime water milky. This is due to the formation of calcium carbonate when carbon dioxide combines with calcium hydroxide (limewater)

3. Answer: C

Solution:

The force experienced by a current carrying conductor placed in a magnetic field is the largest when the angle between the conductor and the magnetic field is 90°

4. Answer: A relative motion between the wire and the magnet is necessary for the production of current by electromagnetic induction.
5. Answer: The strength of electric current flowing in a given conductor depends upon the potential difference and resistance of the conductor.
6. Answer: A mirror of positive focal length is a convex mirror. It is a diverging mirror.

OR

Answer: The image formed by a convex lens of an object placed at 2f is of same size as the object and it is inverted.

7. Answer: The two effects produced by the scattering of light by the atmosphere are: -
   a) Sky appears blue due to the scattering of the blue component of the white light.

b) Sun appears red at sunrise and sunset.

8. Answer:
9. Answer: The resistivity of an alloy is generally higher than that of its constituent metals. Alloys do not oxidize readily at high temperatures.

OR

Answer: The two reasons why different electrical appliances in a domestic circuit are connected in parallel are: -

a. In parallel connection it is possible to use one application while the other is switched off.
b. Voltage remains same throughout in case of parallel connection.

10. Answer: (b) Trophic level

A food chain depicts a linear link of organisms involved in transfer of energy and matter. Each link consists of an organism and is called the trophic level. A single food chain may have three to five trophic levels. The trophic level indicates the mode of nutrition of organism present at that trophic level.

11. Answer: Fusion of male and female gamete is known as fertilization. It occurs in the fallopian tube.

OR

Answer: It is the expulsion of urine from the body

12. Answer: Aerobic respiration occurs in mitochondria of the cell.

OR

Answer: Two functions of Ovary:

(i) To produce female gamete / ovum.
(ii) To secrete female hormones; estrogen and progesterone.

13. Answer:

Respiratory unit of lungs — Alveoli
Excretory unit of kidneys — Nephrons

A-R Type Questions

14. Answer: (c)

Solution:

The resistance of a conductor is inversely proportional to the area of cross-section. For a thinner wire, the area of cross-section is less; consequently, the resistance of the wire is relatively more than a thicker wire.

$$R \propto \frac{1}{A}$$

The resistivity of the conductor depends on the material of the wire.

15. Answer: A

Solution: Non-Metals react with oxygen to form acidic oxide.

$N_2 \Rightarrow N \equiv N \rightarrow$ Stable due to triple bonds and energy required to break this triple bond is high. That's why the reaction of N_2 and O_2 (O=O) does not take place at the normal conditions of temperature and pressure. This can happen only at higher temperatures (» 2000 K).

16. Answer: (c) A is true but R is false.

17. Answer:

(a) (i) Gall bladder stores bile.

(b) (ii) The removal of the gall bladder has no effect on a person's health.

(c) (i) It helps in emulsification of fat.

(d) (ii) Bile is dark green or a yellowish brown fluid which is produced by the liver and comes to the small intestine through hepato-pancreatic duct.

(e) (ii) The food coming from the stomach is acidic and has to be made alkaline for the pancreatic enzyme to act. Bile juice accomplishes this. Bile salts break-down large globules of fats into smaller globules increasing the efficiency of enzyme action.

18. Answer:

(a) Electronic configuration of hydrogen is similar to that of alkali metals. Just like alkali metals, it reacts with halogens, oxygen and sulphur to form compounds of similar formulae. On the other hand, hydrogen reacts with metals and non-metals just like halogens. Due to this anomalous behavior of hydrogen, Mendeleev was unable to fix a position for it.

(b) According to Mendeleev's Periodic Table, the chemical and physical properties of the elements recur periodically when the elements are arranged in the order of their atomic weights.

(c) During Mendeleev's work, only 63 elements were known. After studying the properties of every element, Mendeleev found that the properties of elements were related to atomic mass in a periodic way.

(d) In 1869, after Newlands Octave Law was rejected, Mendeleev Periodic table was introduced. In this periodic table, elements were arranged on the basis of their atomic masses.
A few gaps were left for the elements to be discovered later. Later, Gallium (Ga) and Germanium (Ge) were found that had the same properties as eka– aluminum and eka–silicon, respectively.

(e) Mendeleev left few gaps for the elements to be discovered later.

19. Answers:

(a) Enamel on teeth is made up of an extremely hard mineral called calcium phosphate.

(b) Calcium phosphate is basic salt since it is a source of weak phosphoric acid and a slightly stronger base of calcium hydroxide.

(c) Teeth gets corroded at pH below 5.5, i.e., in moderately acidic conditions.

(d) The tooth enamel is the hardest material in our body. It is made up of calcium phosphate.

(e) To prevent tooth decay,

a. One should brush teeth properly after each meal.

b. Avoid eating sugary foods.

20. Answer:

(a) The slope of the curve gives the value of resistance. Any two values from the table will provide the resistance of the conductor.

$$R = \frac{V}{I} = \frac{0.5}{1.85} = 0.27\Omega$$

Since the value of the resistance measured across different temperature is the same. It follows Ohm's law. Hence, it is an ohmic conductor.

(b) The slope is constant throughout. Thus, we will obtain a straight line parallel to the current axis.

(c) The new resistance can be determined using the formula provided in the paragraph i.e.

$$R = R_0(1 + \alpha\Delta T)$$

$$R = 0.27\left(1 + 3.9 \times 10^{-3}(2830)\right) \Rightarrow R = 3.24\,\Omega$$

(d) Use of a fuse is one of the many caution that is advisable. It limits the value of current that could potential damage the resistor.

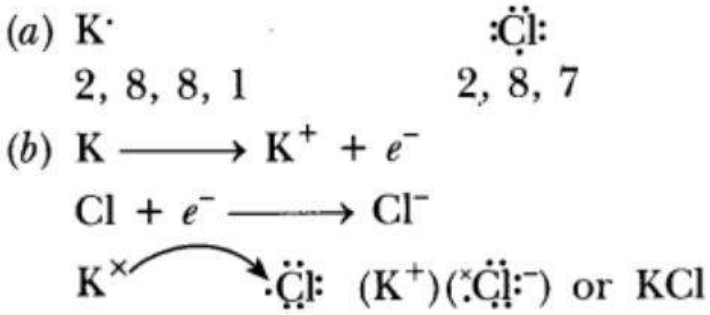
Section-B

21. Answer: The four methods of contraceptives used by humans are:
    (i) Mechanical barrier method.
    (ii) Chemical methods
    (iii) Oral pills
    (iv) Surgical methods

OR

Answer: Nitrogenous waste present in urine is uric acid or urea. The basic filtration unit of the kidney is nephron.

22. Answer: DNA replication or DNA copying is the process of producing two identical replicas from one original DNA molecule during cell division.
    Importance of DNA Copying:
    (i) DNA replication needs to occur so that during cell division, new cells will also have a copy of the organism's DNA.
    (ii) DNA is necessary to make all the RNA and proteins needed for cells to carry out necessary reactions and cellular processes in order to survive.
23. Answer:



(OR)

Answer:

From the description, it can be concluded that the element of the coin is copper. On being heated copper gets oxidized due to the presence of oxygen in air which results in the formation of copper oxide (precisely cupric oxide) which is black in color.

24. Answer:
    (i) When the current was reversed then in that case the rotation of the motor would be reversed.

(ii) When the magnetic field were reversed then in that case the rotation of the motor would reverse.

(iii) When both the current and magnetic field were reversed simultaneously then in that case the rotation of the motor remains same or unchanged.

25. Answer: Here, the resistances 10Ω and 15Ω are connected in series and also the resistances 20Ω and 5Ω are also connected in series.
Thus, R_1 = 10Ω + 15Ω = 25Ω
R_2 = 20Ω + 5Ω = 25Ω
Now, these two resistances R_1 and R_2 are connected in parallel

$$\therefore \frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$R = \frac{R_1 \times R_2}{R_1 + R_2}$$

$$R = \frac{25 \times 25}{25 + 25}\Omega = \frac{625}{50}\Omega$$

$$R = 12.5\Omega$$

Thus the net resistance is 12.5Ω.

26. Answer: Refractive index is the measure of bending of ray of light as it passes from one medium to another. It is also defined as the ratio of the speed of light in vacuum to the speed of light in any medium.
Refractive index (μ)

$$\frac{\text{c (speed of light in vaccum)}}{\text{v(speed of light in any medium)}}$$

Given,
Speed of light in a medium (v),

$$\frac{2c}{3}$$

$$\mu = \frac{c}{\frac{2c}{3}}$$

$$\mu = \frac{3c}{2c} = 1.5$$

Hence, the refractive index of medium is 1.5.

Section-C

27. Answer:

(a) Reasons:

(i) Pea plants are small and easy to grow.

(ii) A large number of true breeding varieties of pea plant are available.

(iii) Short life cycle.

(iv) Both self and cross-pollination can be made possible.

(b) Contrasting characters:

Round / Wrinkled seeds

Tall / Short plants

White / Purple flowers

Green / Yellow seeds

OR

Answer:

(i) Ovary: Produces egg or female gamete, female sex hormone/estrogen.

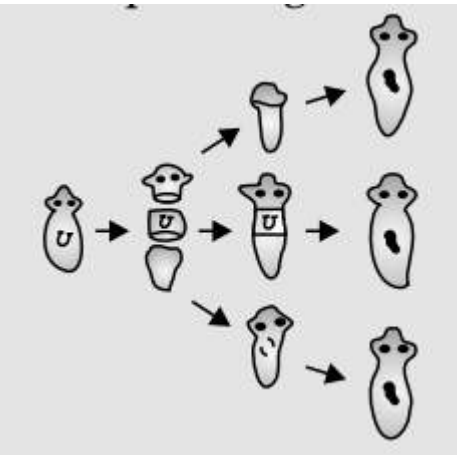
(ii) Fallopian tube: Transfer of ovum to the uterus, site for fertilization

(iii) Uterus: Site of implantation of zygote, development of embryo.

28. Answer:

(a) These methods involve only one parent/organisms are formed as a result of mitotic division/progeny (organisms) are similar in their genetic makeup with no variations.

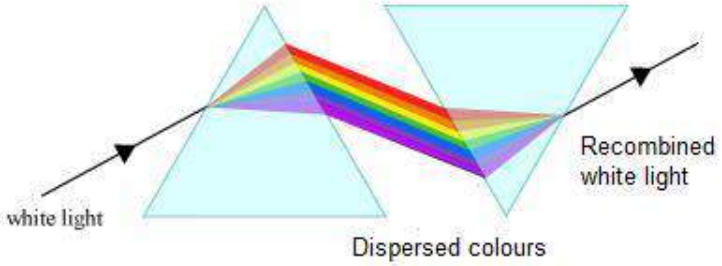
(b) Planaria can be cut into any number of pieces and each piece grows through specialized cells into a complete organism.



29. Answer: (a) Process involved in removal of nitrogenous harmful metabolic waste from the body.
(b) Nephron.
30. Answer: (a) The salt containing water of crystallization is called hydrated salts. For e.g., Epsom salt, gypsum, washing soda
(b) Deliquescence is the property of salt by which hydrated salt can absorb moisture from the air and become moist. Salt like magnesium chloride shows this property.

31. Answer:
(a) It is because it reacts with acids as well as bases to produce salts and water. 'Al' is less electropositive metal. So, it forms amphoteric oxide which can react with acid as well as base.
(b) Ionic compounds can conduct electricity in molten state because in molten state there is formation of ions which become free to move in molten state.
32. Answer: The advantage of using baking powder is that tartaric acid present in baking powder reacts with sodium carbonate produced during decomposition and neutralizes it.
If only sodium hydrogen carbonate (baking soda) is used in making a cake, then sodium carbonate formed from it by the action of heat (during baking) gives a bitter taste to the cake. By adding Tartaric Acid to baking soda, the Baking powder is formed.
33. Answer:
(a) 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) According to the question it is given;
Object distance (u) = -60cm;
Image distance (v) = 120cm;
Focal length = f
By lens formula;

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

$$\Rightarrow \frac{1}{120}-\frac{1}{-60}=\frac{1}{f}$$

$$\Rightarrow \frac{1}{f}=\frac{1}{120}+\frac{1}{60}$$

$$\Rightarrow \frac{1}{f}=\frac{1+2}{120}=\frac{3}{120}$$

$$\Rightarrow f=\frac{120}{3}$$

$\Rightarrow$ f = 40cm.

Therefore, the focal length of lens is 40 cm.
Since the focal length is positive. Therefore, the lens is convex lens of focal length 40cm.
Now;
Height of object h_1= 5cm;
Magnification (m),

$$m = \frac{H_2}{H_1} = \frac{v}{u}$$

Putting values of v and u
Magnification,

$$\frac{h_2}{5} = \frac{120}{-60}$$

$$\frac{h_2}{5} = -2$$

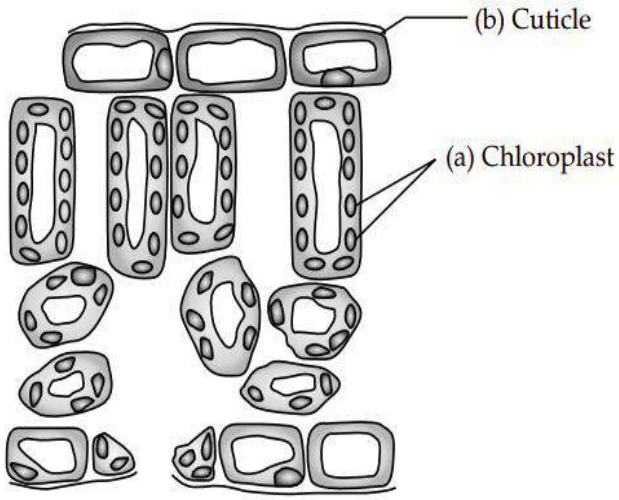
$\Rightarrow h_2 = -2 \times 5 = -10$ cm
Height of image is 10 cm.
Negative sign means image is real and inverted.

Section-D

34. Mention the organ and site of photosynthesis in green plants. What are the raw materials essential for this process? How are they obtained? Write a complete balanced chemical equation for the process. Name the by-products.

OR.

Answer: (i)



(ii) Oxygen.
By splitting of water (photolysis)

$$2H_2O \xrightarrow{\text{splits}} 2H_2 + O_2$$

(iii) They take up CO2 at night through stomata, which open during night and produce an intermediate organic acid which is acted upon by the

energy absorbed by chlorophyll during the day and breaks up to release of CO2. The CO2 so produced internally is used in photosynthesis during the day when stomata are closed.
Desert plants.

35. Answer:
    (a) In the above elements Sodium does not belong to this group because Sodium belongs to the group of alkali metals and the rest three belong to the alkaline earth metals group.
    (b) Limitations of Newland's law of octaves are listed as below:
        (i) This law was applicable only for lighter elements. It did not hold true for the classification of elements after calcium. After calcium, not every eighth element had properties similar to the first element.
        (ii) He thought that only 56 elements existed in nature and that no more would ever be discovered. However, later many new elements were discovered and their properties did not fit into Newland's law of octaves.

    He put two elements in one slot even in the column of unlike elements having different properties. For example, he put cobalt Cobalt (Co) and nickel (Ni) in a single slot with elements like fluorine, chlorine and bromine with which their properties do not match at all.
    (c) In modern periodic table the elements are placed according to their atomic number so cobalt is 27 and nickel is 28, so in modern periodic table cobalt comes first and then Nickel.

36. Answer:
    a. A magnetic field exerts force only on moving charges. So, a stationary charge kept in a magnetic field does not experience any force until it starts moving.
    b. The direction of force experienced by a current carrying conductor placed in a magnetic field depends on:
    - the direction of the current in the conductor
    - direction of the magnetic field applied

    c. The force experienced by a current carrying conductor placed in a uniform magnetic field is maximum when the current makes right angle with the magnetic field.

d. The force experienced by a current carrying conductor placed in a uniform magnetic field is maximum when the current makes right angle with the magnetic field.

OR

Answer:

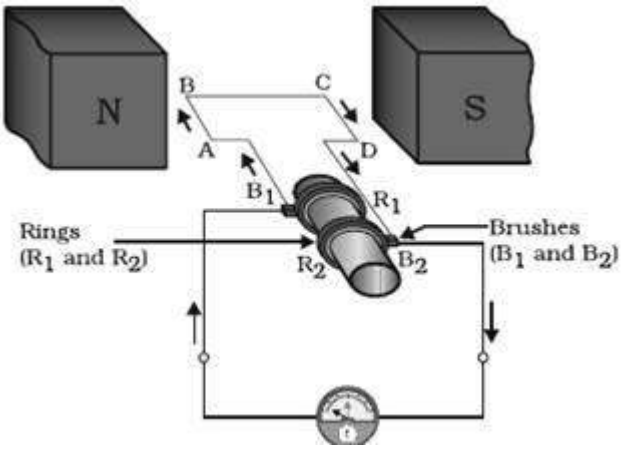
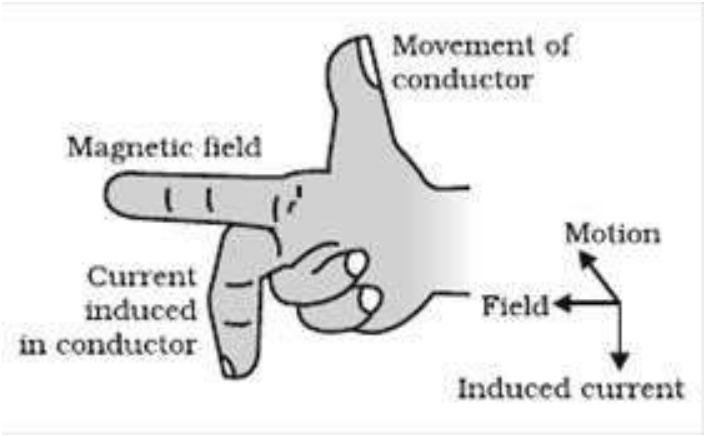


Fig. AC generator

The axle of an AC generator is rotated such that one arm AB moves up and other CD moves down. The change in the magnetic field linked to the coil induces current in the coil. From Fleming's right hand rule, the current flows from AB to CD in the coil during half rotation and from B_2 to B_1 in the external circuit.

After half rotation, the arm CD starts moving upward and AB downwards. So, the current starts flowing from CD to AB by Fleming's Right hand rule. As a result the current starts flowing from B_1 to B_2 in the external circuit after half rotation.

In this way, the direction of induced current changes after each half rotation in an AC generator.


Movement of
conductor
Magnetic field
Motion
Current
induced
in conductor
Field
Induced current