

SOLUTIONS : 10th CBSE 2023 CODE 31/5/1

1. Select a pair of olfactory indicators from the following :

- (a) ☒ Clove oil and vanilla essence (b) Onion and turmeric
(c) Clove oil and litmus solution (d) Vanilla and methyl orange

2. The balanced chemical equation showing reaction between quicklime and water is :

- (a) $2 \text{CaO} + \text{H}_2\text{O} \longrightarrow 2 \text{CaOH} + \text{H}_2 + \text{Heat}$
(b) $\text{CaO} + \text{H}_2\text{O} \longrightarrow \text{Ca(OH)}_2 + \text{H}_2 + \text{Heat}$
(c) ☒ $\text{CaO} + \text{H}_2\text{O} \longrightarrow \text{Ca(OH)}_2 + \text{Heat}$
(d) $2 \text{CaO} + 3 \text{H}_2\text{O} \longrightarrow 2 \text{Ca(OH)}_3 + \text{O}_2 + \text{Heat}$

3. Study the following chemical reaction :



The reducing agent in this reaction is :

- (a) ☒ Na (b) H_2O
(c) NaOH (d) H_2

4. Fresh milk has a pH of 6. To delay its curdling, a chemical substance is added to it, which is :

- (a) Sodium carbonate
(b) Baking powder
(c) Sodium hydroxide (Caustic soda)
(d) ☒ Baking soda (Sodium hydrogen carbonate)

5. Which of the following statements is true for an amphoteric oxide ?

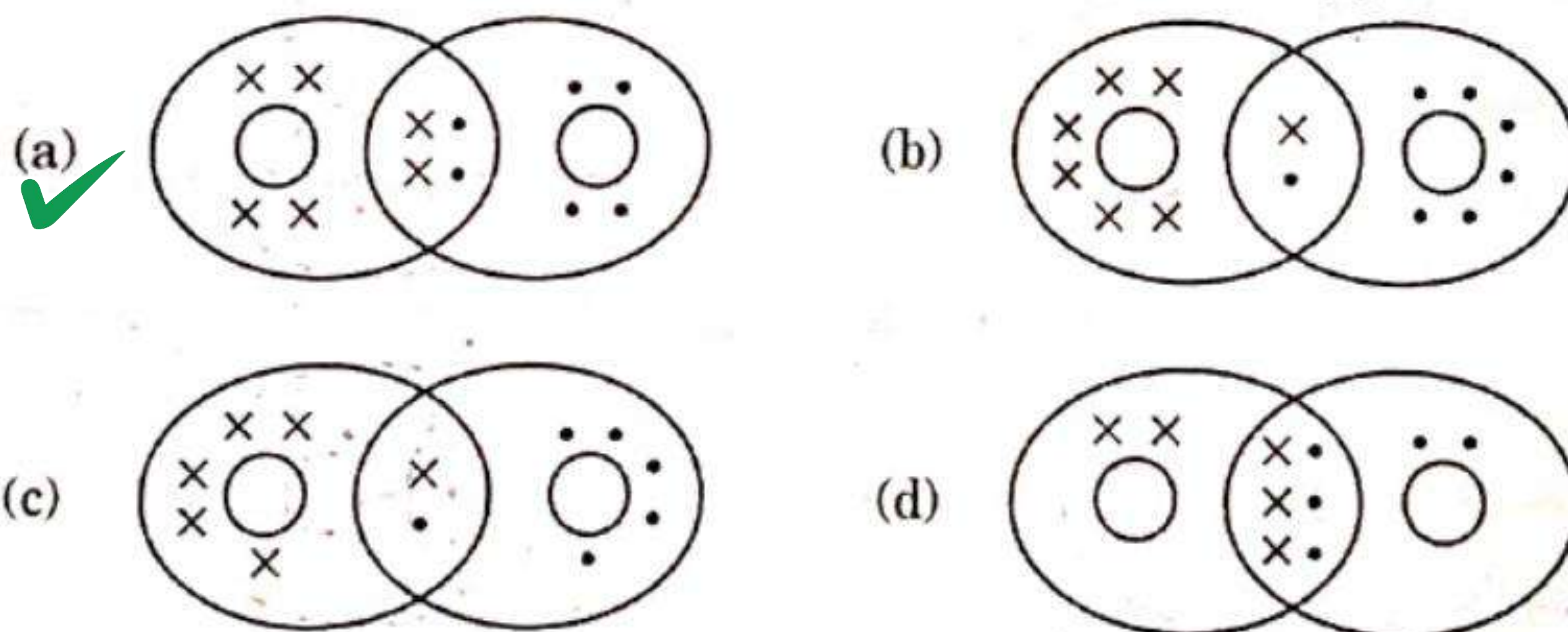
- (a) It reacts only with acid and does not form water.
(b) It reacts with acid as well as base to form salt and hydrogen gas.
(c) ☒ It reacts with both acid as well as base to form salt and water.
(d) It reacts only with base and does not form water.

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6. Hydronium ions are formed by the reaction between :

- (a) Sodium hydroxide and water (b) Calcium chloride and water
 (c) ☒ Hydrogen chloride gas and water (d) Ethanol and water

7. The correct representation of covalent bonding in an oxygen molecule is :



8. The process in which loss of water in the form of vapours from the aerial parts of plants takes place is X, which helps in Y. Here X and Y respectively are :

- (a) transpiration and photosynthesis.
 (b) ☒ transpiration and temperature regulation.
 (c) translocation and movement of soluble products of photosynthesis in phloem.
 (d) translocation and absorption of water and minerals from soil by roots.

9. As compared to terrestrial organisms, the rate of breathing in aquatic organisms is :

- (a) faster because they need more oxygen for their survival.
 (b) ☒ faster because the amount of dissolved oxygen in water is fairly low.
 (c) slower because the amount of dissolved oxygen in water is fairly low.
 (d) slower because the capacity of water of dissolving atmospheric air is limited.

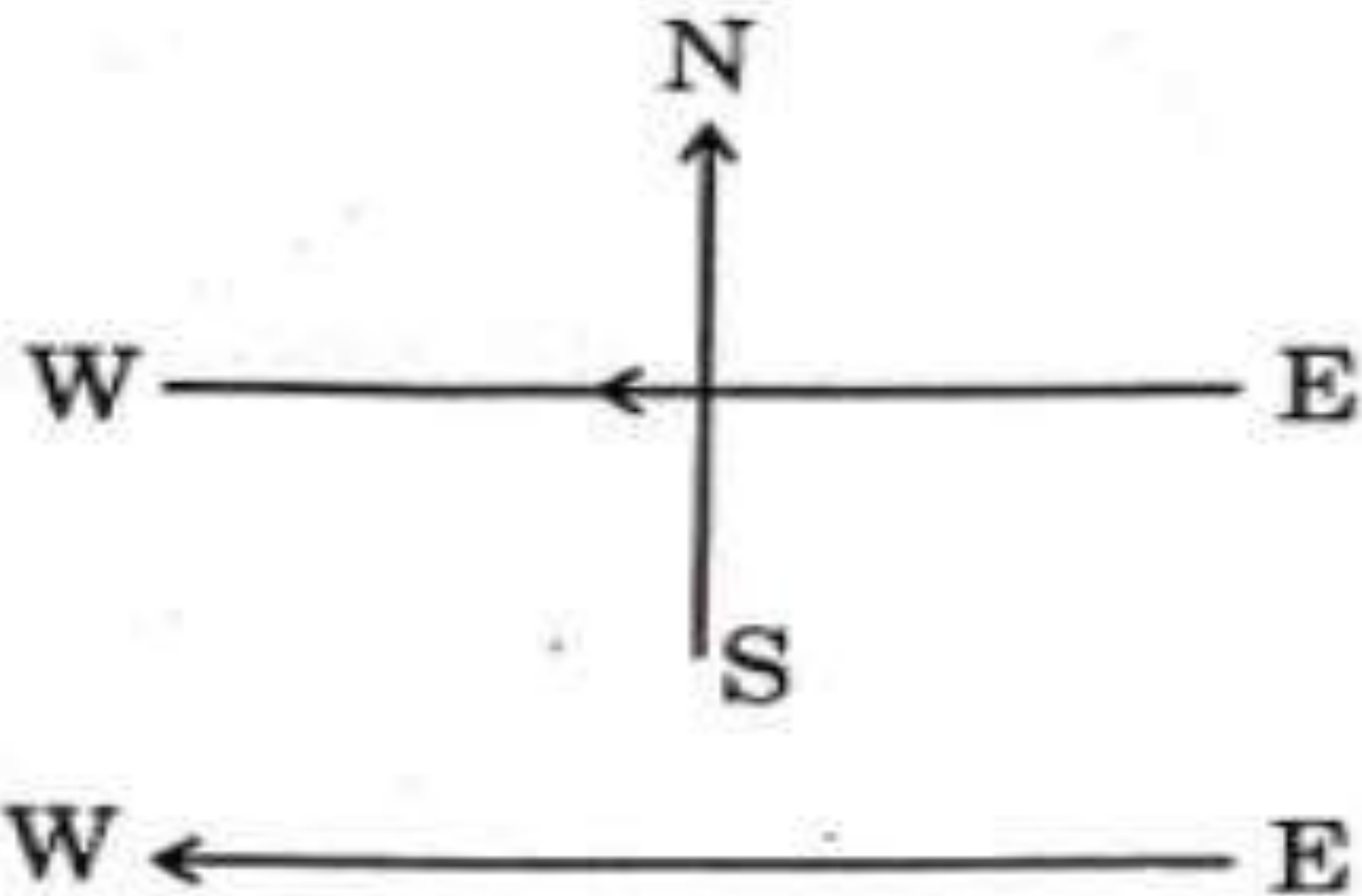
10. Consider the following two statements :

- (i) The trait that expresses itself in F₁ generation.
 (ii) The trait that keeps on passing from one generation to another.

The appropriate terms for the statements (i) and (ii) respectively are :

- (a) Recessive trait, Dominant trait
 (b) Dominant trait, Recessive trait
 (c) ☒ Dominant trait, Inherited trait
 (d) Recessive trait, Inherited trait

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11. The part in which gustatory receptors are present in our body is :
 (a) inner ear (b) skin
 (c) ☒ tongue (d) inner lining of nose
12. The bacterial and the viral infections that may be caused due to unsafe sex respectively are :
 (a) Warts and HIV-AIDS (b) HIV-AIDS and Warts
 (c) Gonorrhoea and Syphilis (d) ☒ Syphilis and Warts
13. The expressions that relate (i) Q , I and t and (ii) Q , V and W respectively are (Here the symbols have their usual meanings) :
 (a) (i) $I = \frac{Q}{t}$ (ii) $W = \frac{V}{Q}$
 (b) ☒ (i) $Q = I \times t$ (ii) $W = V \times Q$
 (c) (i) $Q = \frac{I}{t}$ (ii) $V = \frac{W}{Q}$
 (d) (i) $I = \frac{Q}{t}$ (ii) $Q = \frac{V}{W}$
14. A constant current flows in a horizontal wire in the plane of the paper from east to west as shown in the figure. The direction of the magnetic field will be north to south at a point :

 (a) directly above the wire.
 (b) ☒ directly below the wire.
 (c) located in the plane of the paper on the north side of the wire.
 (d) located in the plane of the paper on the south side of the wire.

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15. An electric kettle consumes 1 kW of electric power when operated at 220 V. The minimum rating of the fuse wire to be used for it is

- (a) 1 A
- (b) 2 A
- (c) 4 A
- (d) 5 A

16. For a current in a long straight solenoid, N and S poles are created at the two ends. Among the following statements, the *incorrect* statement is :

- (a) The magnetic field lines inside the solenoid are in the form of straight lines, which indicates that the magnetic field is uniform at all points inside the solenoid.
- (b) The strong magnetic field produced inside the solenoid can magnetize the soft iron placed inside it.
- (c) The pattern of the magnetic field associated with a current carrying solenoid is different from the pattern of the magnetic field around a bar magnet.
- (d) The N and S poles exchange positions when the direction of current through the solenoid is reversed.

For questions number 17 to 20, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below :

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

17. Assertion (A) : In the following reaction



A

ZnO undergoes reduction.

Reason (R) : Carbon is a reducing agent that reduces ZnO to Zn.

18. *Assertion (A)* : Human populations show a great deal of variations in traits.

C

Reason (R) : All variations in a species have equal chances of surviving in the environment in which they live.

19. *Assertion (A)* : The walls of atria are thicker than those of the ventricles.

D

Reason (R) : Ventricles have to pump blood into various organs at high pressure.

20. *Assertion (A)* : Two magnetic field lines around a current carrying straight wire do not intersect each other.

B

Reason (R) : The magnitude of the magnetic field produced at a given point increases as the current through the wire increases.

21. (a) On heating 'X' at 373 K, it loses water molecules and becomes 'Y'. 'Y' is a substance which doctors use for supporting fractured bones in the right position.

- (i) Identify 'X' and 'Y'.
(ii) How can 'X' be reobtained from 'Y'?

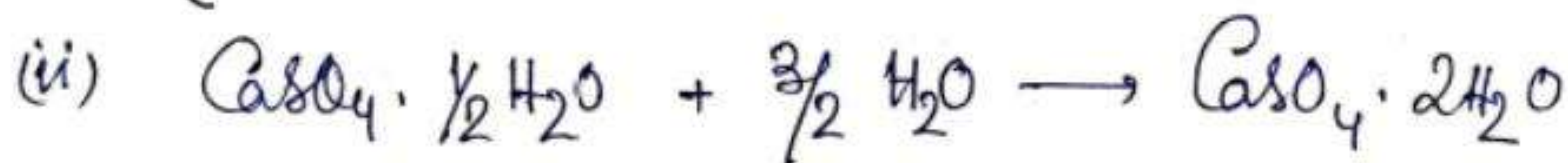
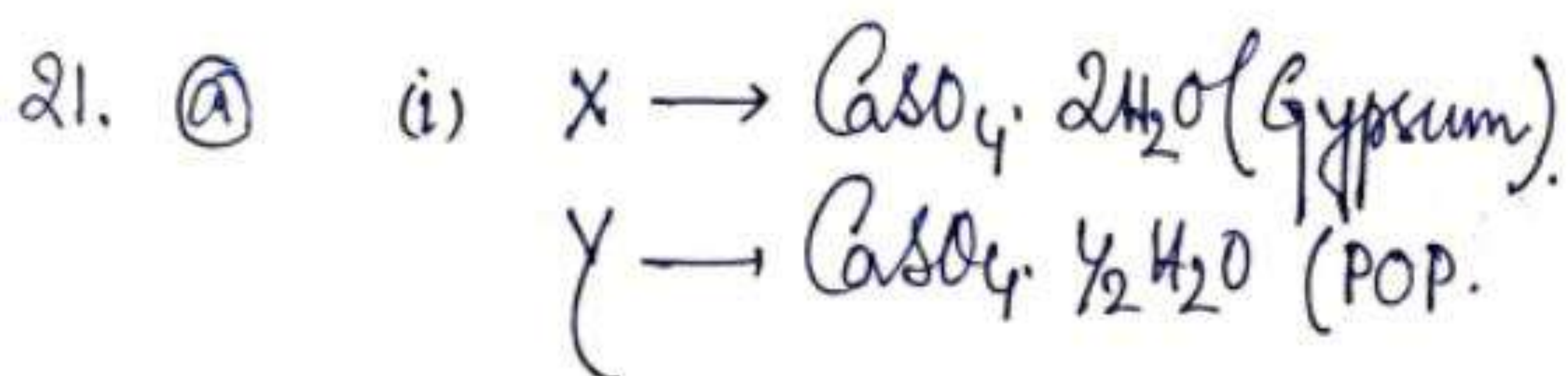
2

OR

- (b) Two solutions M and N give Red and Blue colour respectively with a universal indicator.

- (i) In which solution will the hydrogen ion concentration be more? Justify your answer.
(ii) If both M and N solutions are mixed and the resultant mixture is tested with a universal indicator, it turns green. What is the nature of the salt formed? Justify your answer.

2



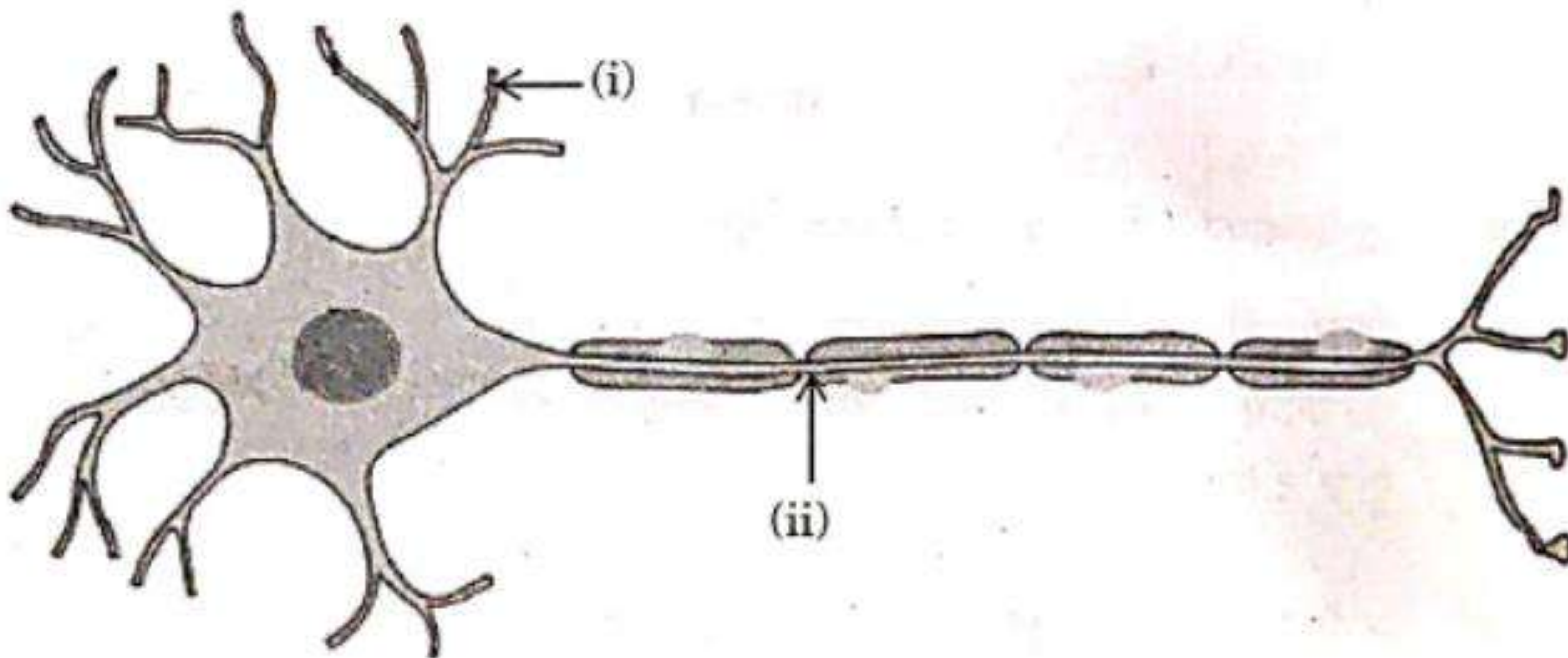
(b) (i) Red \Rightarrow Refers to ~~alkaline~~ acidic soln.
Blue \Rightarrow Refers to ~~acidic~~ alkaline soln.

"M" has higher H^+ conc. because it is highly acidic

(ii) Green \Rightarrow weakly alkaline / neutral

So, it should be a salt of Strong acid & Strong base.

22. Write the name and function of parts (i) and (ii) in the diagram of a neuron given below. 2



Ans-22) (i) dendrites (ii) axon

23. (a) List the events in proper sequence that take place during the process of photosynthesis. 2

OR

- (b) Explain in brief two ways by which leaves of a plant help in excretion. 2

Ans-23) Steps of photosynthesis: 1. Absorption of light energy by chlorophyll. 2. Conversion of light energy to chemical energy and splitting of water molecule into hydrogen and oxygen. 3. Reduction of carbon dioxide to carbohydrates.

or

Ans-23) (B) Leaves help in excretion - a. Via guttation (exudation of water droplets from xylem sap) and transpiration (evaporation of water from stomata) excess water is lost through the leaves of plants.

B. Oxygen is excreted through stomatal pores during the process of photosynthesis (synthesis of chemical energy from sunlight).

C. CO₂ is excreted out from the stomatal aperture of leaves during respiration.

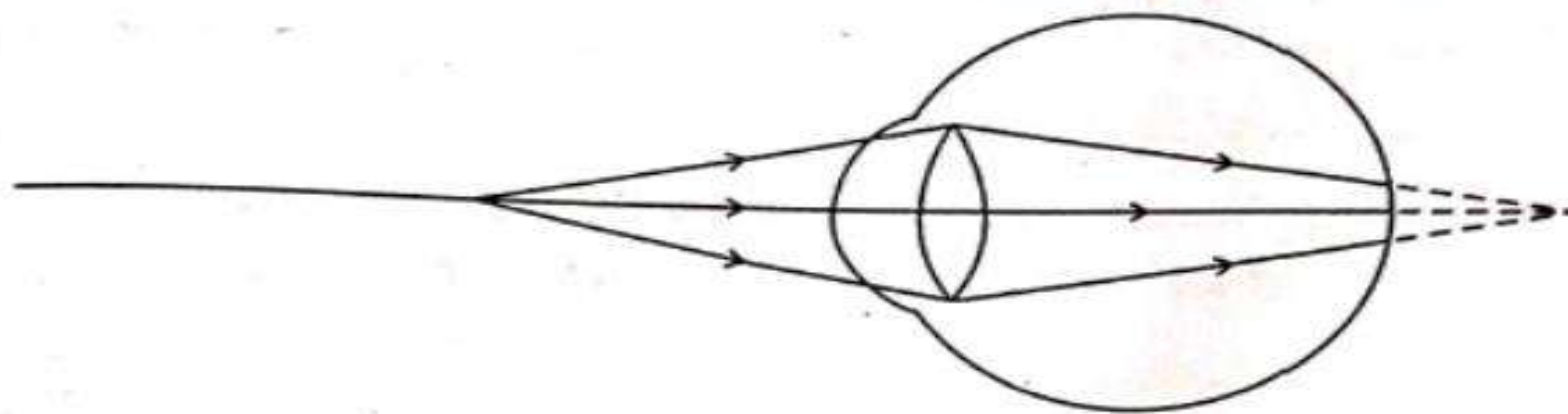


24. In the process of digestion of food in human beings, two protein-digesting enzymes are secreted. Name the enzymes along with the glands that secrete them.

2

Ans-24) Two protein digesting enzymes are pepsin and trypsin. Pepsin is secreted by stomach and Trypsin is secreted by Pancreas.

25. Observe the following diagram showing an image formation in an eye :



- (a) Identify the defect of vision shown in the figure.
 (b) List its two causes and suggest a suitable corrective lens to overcome this defect.

2

(25). (a) Hypermetropia

(b) → causes :

↓
 Focal length of the eye lens is too long.

↓
 eyeball has become too small

→ correction :

↓
 convex lens of suitable focal length.

26. In the following food chain, if 50 J of energy was available to the hawk, how much energy would have been present at the first and third trophic levels? Justify your answer.

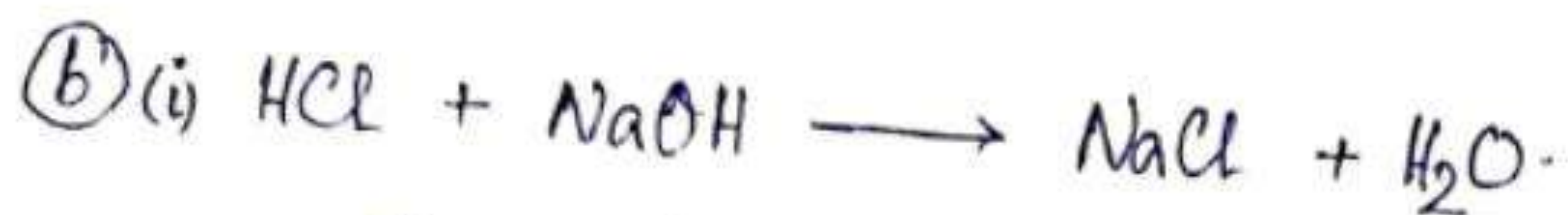
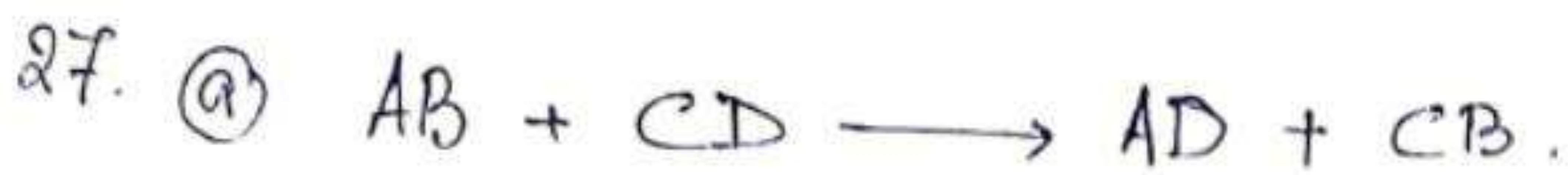
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Grass \longrightarrow Grasshopper \longrightarrow Frog \longrightarrow Snake \longrightarrow Hawk

Ans-26) Generally, per trophic level, there is a loss of 10% of the total energy. if 50 J of energy was available to the hawk,
 grass will have 5,00,000 J
 Grasshopper will have 50,000 J
 Frog will have 5000 J
 Snake will have 500 J
 So first trophic level grass has 5,00,000 J of energy
 And third level frog will have 5,000 J of energy

27. (a) Define a double displacement reaction.
 (b) Write the chemical equation of a double displacement reaction which is also a (i) Neutralization reaction and (ii) Precipitation reaction. Give justification for your answer.

3



Na^+ combines with Cl^- , while H^+ combines with OH^- .

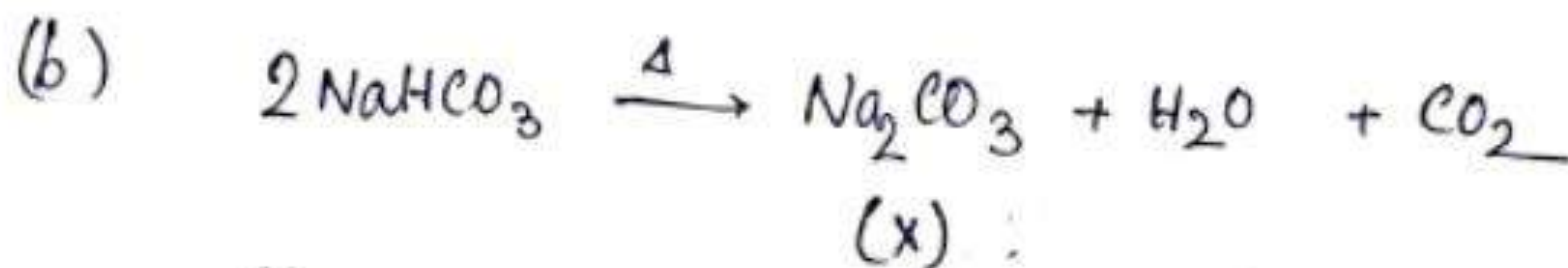


K^+ combines with NO_3^- , while Pb^{2+} combines with I^- .

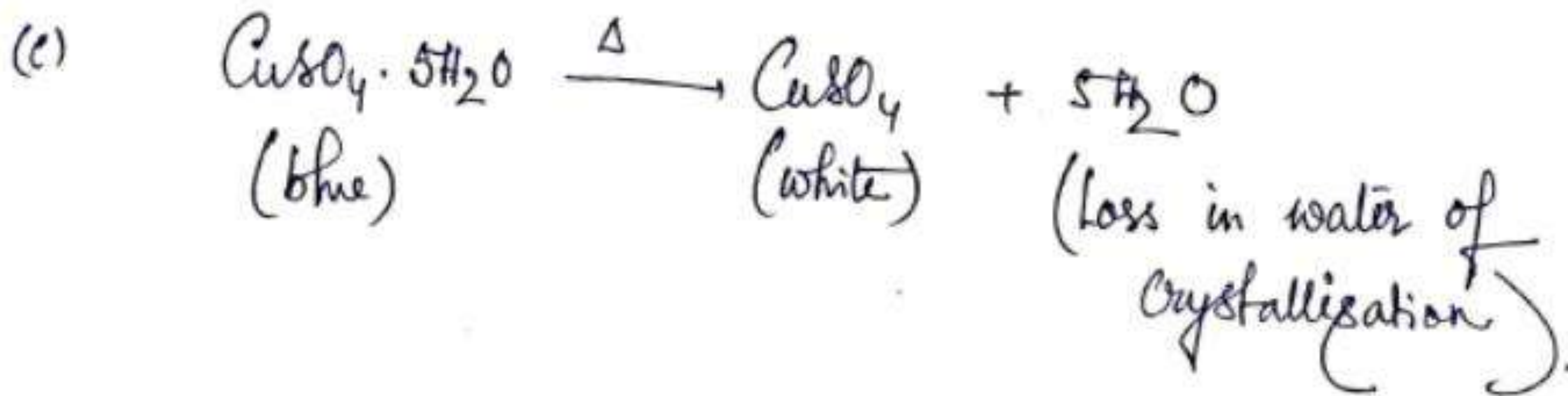
28. (a) Sometimes the pH of our mouth gets lower than 5.5. Why?
- (b) A basic salt 'X' is obtained by heating baking soda followed by crystallisation. Identify 'X' and state its two industrial uses.
- (c) Why do copper sulphate crystals turn white on heating?

3

28. (a) Bacteria present in mouth produce acids by degradation of sugar & food particles left in mouth.

Uses:

- (i) Removal of permanent hardness.
(ii) Used in glass, soap & paper industries.





29. (a) With the help of an activity, explain the action of saliva on the food we eat.
- (b) Why is bile juice important in the process of digestion ?

3

Ans-29) Experiment:

A. Boiled potato is used here in mashed form and separated into three parts.

Separate them in test tube A, test tube B and test tube C.

In the test tube A, iodine is added. 2

In the test tube B, iodine is added and then saliva is introduced.

In test tube C, nothing is added and kept as the control set.

Observation:

The test tube A, the iodine solution changes the boiled potato to blue color.

In the test tube B, saliva is introduced and mixed with the sample after adding iodine.

As a result, the color change will be observed when starch will be broken down to simple sugars like maltose.

The blue color starts reducing in the test tube B as the saliva containing the salivary amylase starts acting on the starch.

Test tube C shows no color change.

Inference:

The change in the test tube containing saliva shows the effect of salivary enzymes like salivary amylase on the boiled starch present in potato.

B. Bile helps with digestion. It breaks down fats into fatty acids by emulsification, which can be taken into the body by the digestive tract. Bile helps to activate the enzyme lipase for digestive action on fats.

30. (a) (i) An object of 5 cm height is placed at a distance of 20 cm from the optical centre of a concave lens of focal length 18 cm. Calculate (1) image distance and (2) the magnification in this case.

(ii) Compare the values of magnification obtained by a concave lens and a convex lens when both the lenses form virtual images.

3

OR

(b) A convex lens can form a (i) real, inverted and magnified image as well as (ii) virtual, erect and magnified image of an object. If the focal length of the lens is 10 cm, what should be the range of the object distance in both cases? Draw ray diagrams to justify your answer.

3

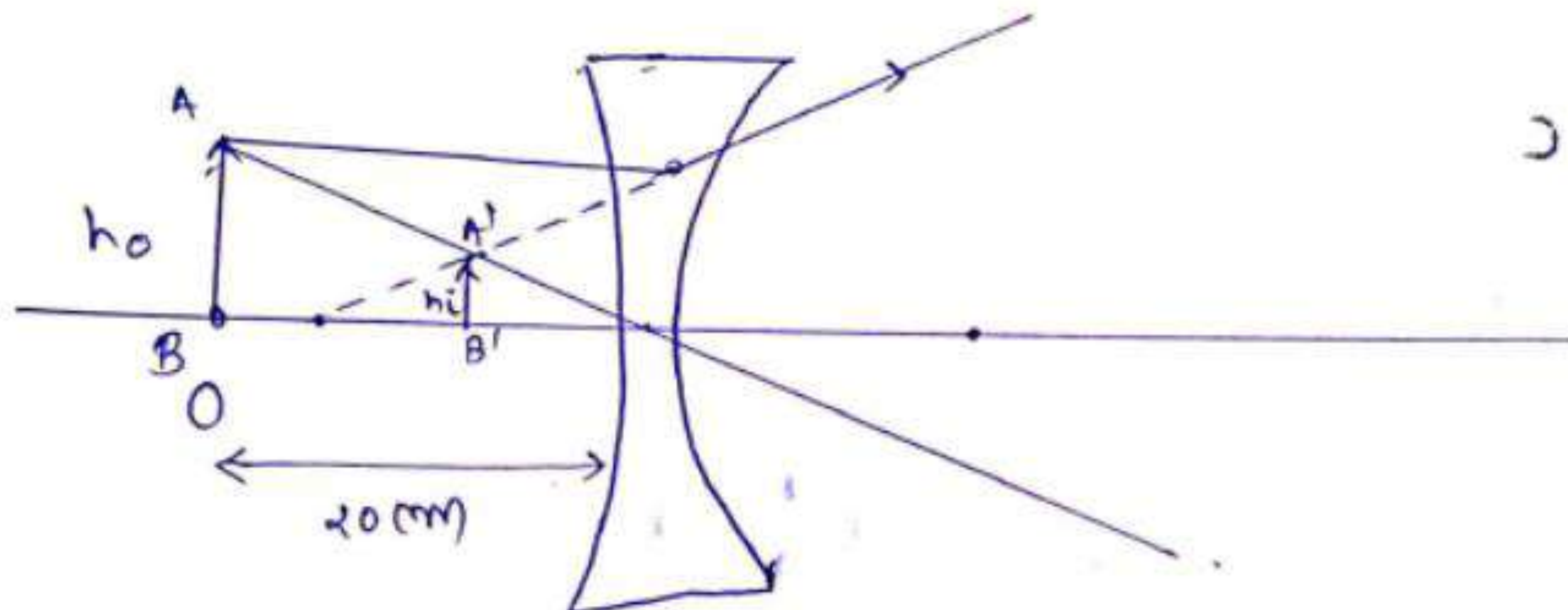
[30] (a)

(i)

$$h_o = 5 \text{ cm}$$

$$u = -20 \text{ cm}$$

$$f = -18 \text{ cm (concave)}$$



① According to lens formula,

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

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

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

$$\Rightarrow \therefore v = \frac{u \cdot f}{u + f}$$

$$= \frac{(-20)(-18)}{-20-18}$$

$$v = \frac{360}{-38} = -\frac{180}{19} \text{ cm}$$

————— (i)

(ii) Magnification $m = +\frac{v}{u} = +\frac{\left(-\frac{180}{19}\right)}{-20} = \frac{9}{19}$

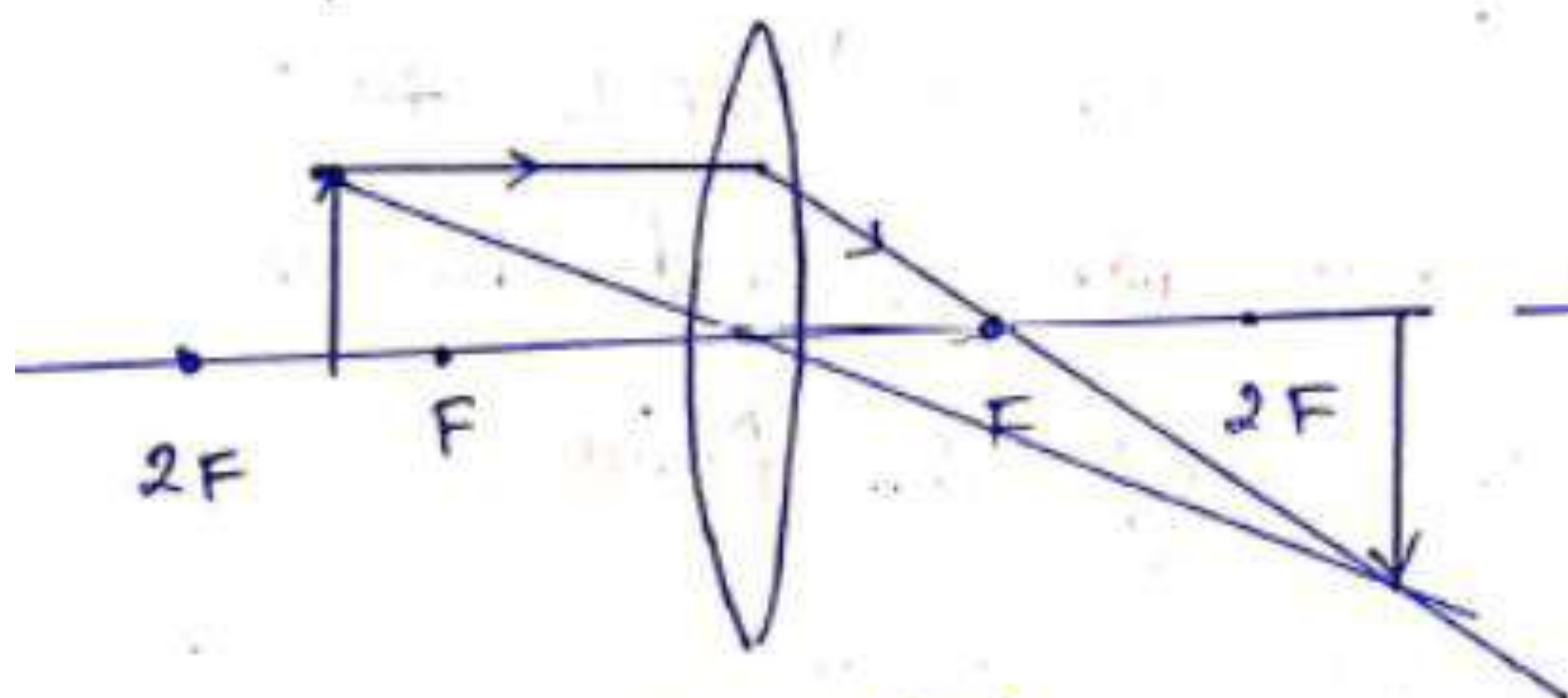
30. @

(ii) Magnification in concave lens is always positive and less than 1.
 $[m < 1]$ & +ve.

→ In case of convex lens when image is virtual magnification is +ve and greater than 1.
 $[m > 1]$

Q-30
OR

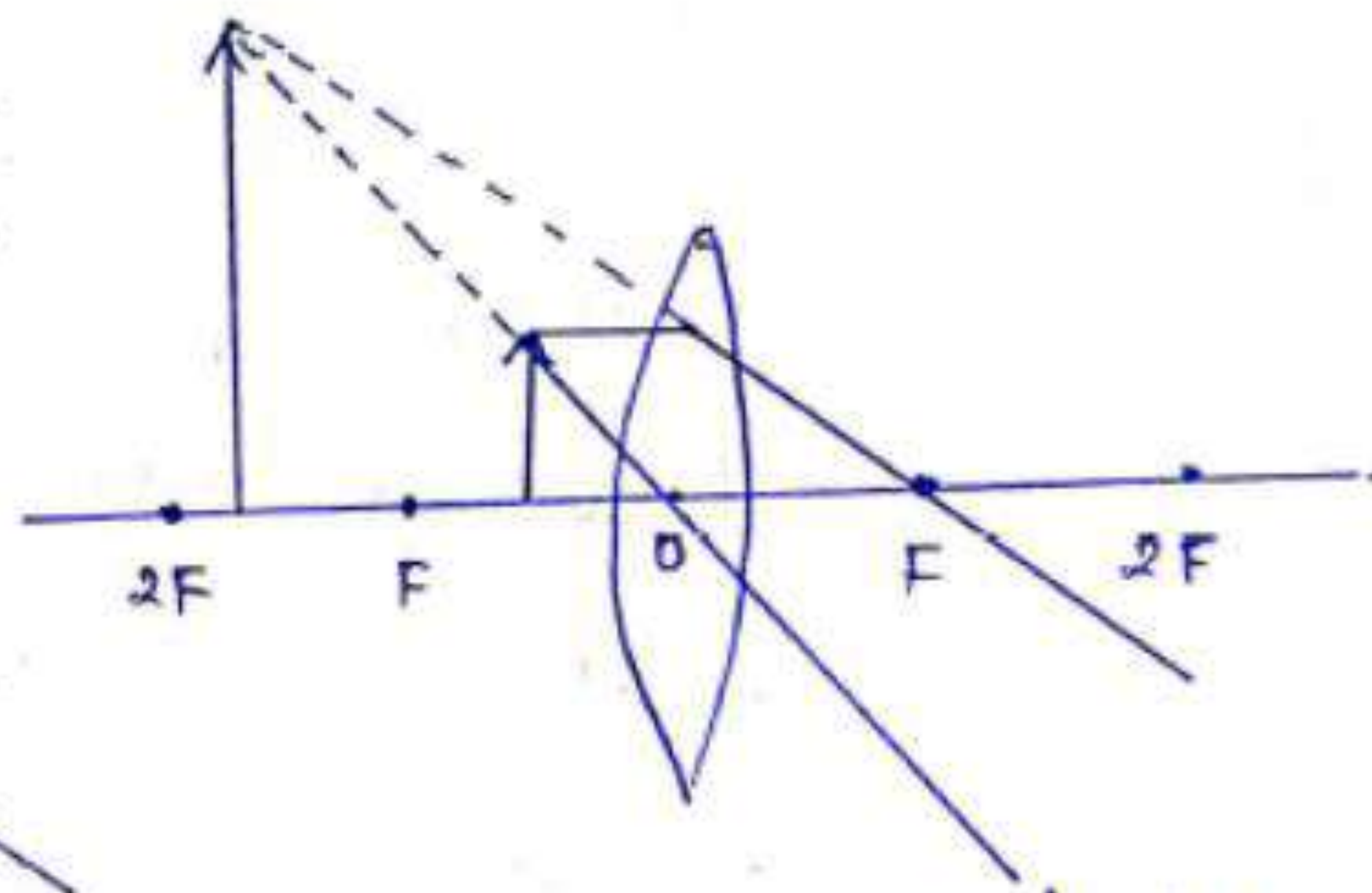
(6)



$$f = 10 \text{ cm}$$

→ object should be placed between F & $2F$ for getting real, inverted and magnified image.

→ so, the object distance should be between ~~10 cm to 20 cm~~ 10 cm and 20 cm.



→ object should be placed between ~~at~~ focus and optical centre to get virtual, erect and magnified image.

→ so, the object distance should be 0 to 10 cm.

31. (a) State one important function of the following parts of the human eye :

(i) Retina

(ii) Pupil

(b) State the role of ciliary muscles in focussing objects at varying distances from the eye.

3

[31]
a

(i) Retina :

→ It is a delicate membrane having a large number of light-sensitive cells called 'rods' and 'cones' which respond to the intensity of light and colour of objects respectively.

(ii) Pupil :

→ It controls the illumination in the eye.

⑥ The ciliary muscles can change the curvature of the eye lens, and hence the focal length necessary to form objects at various distances on the retina.

32. (a) (i) A straight cylindrical conductor is suspended with its axis perpendicular to the magnetic field of a horse-shoe magnet. The conductor gets displaced towards left when a current is passed through it. What will happen to the displacement of the conductor if the
- (1) current through it is increased ?
 - (2) horse-shoe magnet is replaced by another stronger horse-shoe magnet ?
 - (3) direction of current through it is reversed ?



- (ii) Name and state the rule for determining the direction of force on a current carrying conductor in a magnetic field.

3

OR

- (b) Draw the pattern of the magnetic field produced around a vertical current carrying straight conductor passing through a horizontal cardboard. Mark the direction of current and the magnetic field lines. Name and state the rule which is used to determine the direction of magnetic field associated with a current carrying conductor.

3

[32] (a)

(i) ① If current is increased, force on the conductor will increase, so displacement will increase.

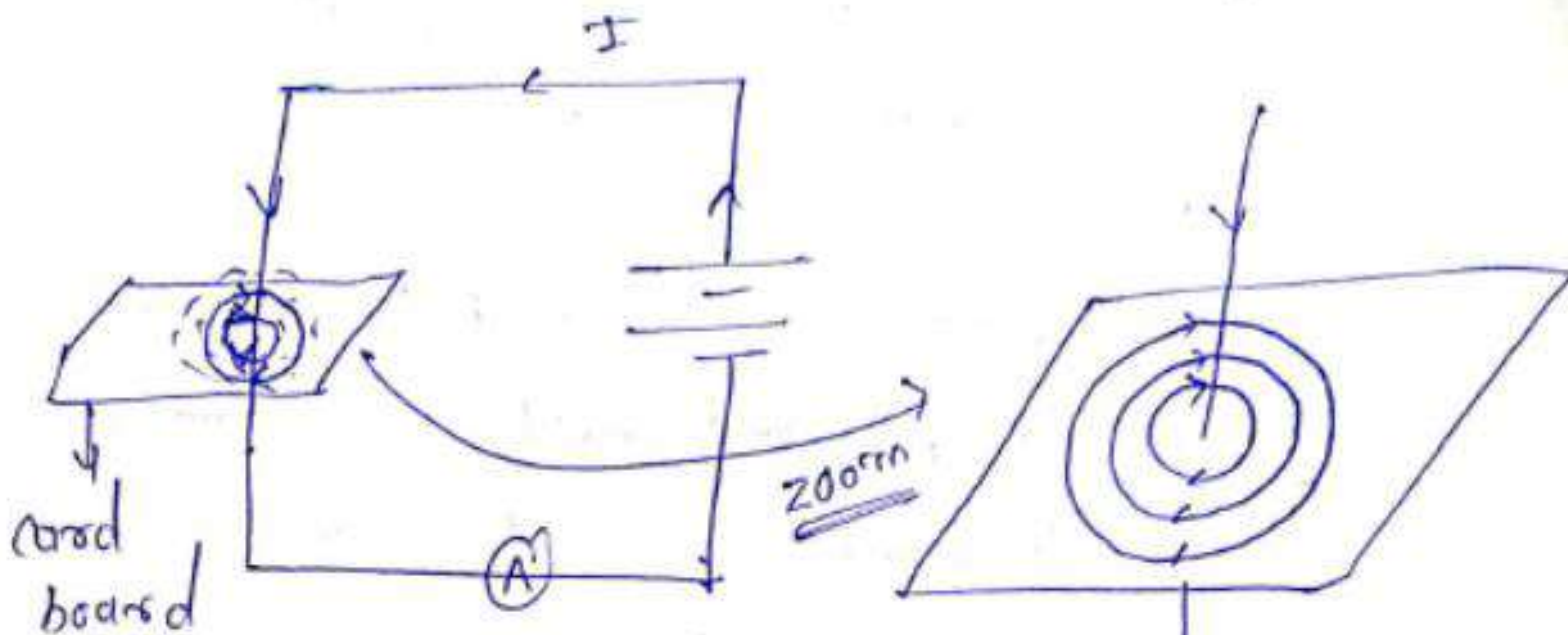
② By replacing the magnet by stronger magnet, magnetic field will increase, so displacement will also increase.

③ ~~dir~~ If the direction of current is reversed then displacement will be in opposite direction.

(ii) Fleming's Left hand Rule:

→ "If we'll place our thumb, index finger and middle finger perpendicular to each other and if ~~thumb~~ index finger is kept in the direction of magnetic field and middle finger in the direction of current, then direction of thumb will tell you the direction of motion of the conductor."

Q2 → OR
⑥



→ To determine the direction, we shall use Maxwell's right hand thumb rule.

"If we'll keep our right hand thumb in the direction of current and curl our fingers across the wire, then the direction of curled fingers will give us the magnetic field lines"

33. How is ozone formed in the higher levels of the atmosphere ? "Damage to the ozone layer is a cause of concern." Justify this statement.

3

Ans-33) Ozone which is also called trioxygen, is an inorganic molecule. It has a chemical formula- O_3 .

Formation of ozone:

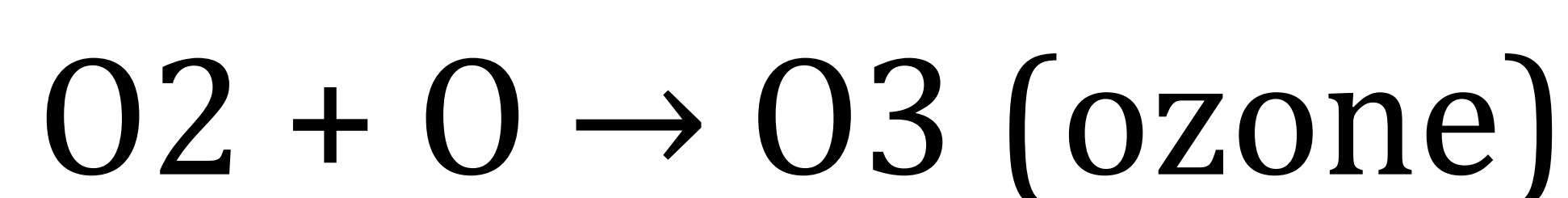
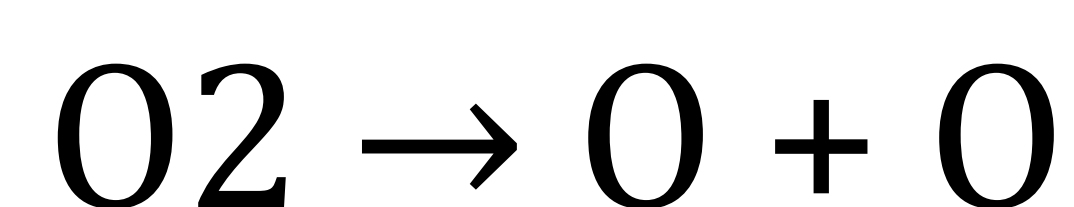
Ozone is maximally present in the stratosphere of the atmosphere.

In the atmosphere, the formation of ozone is a continuous process because UV rays have continuous action on the molecular oxygen.

In the presence of electrical discharges within the atmosphere, the UV rays break down molecular oxygen into nascent oxygen.

The nascent oxygen then combines with the molecular oxygen to form an ozone molecule.

Reaction that follows this process:

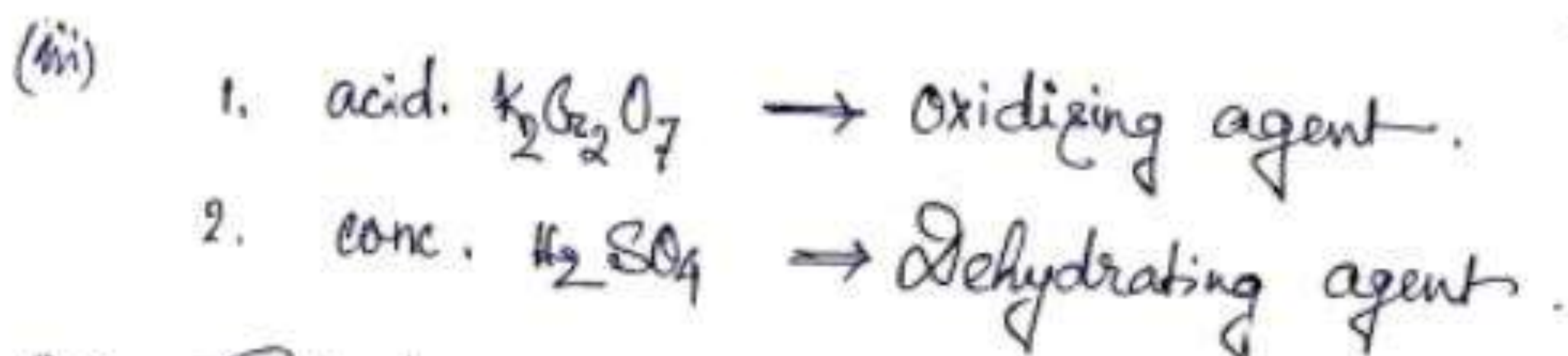
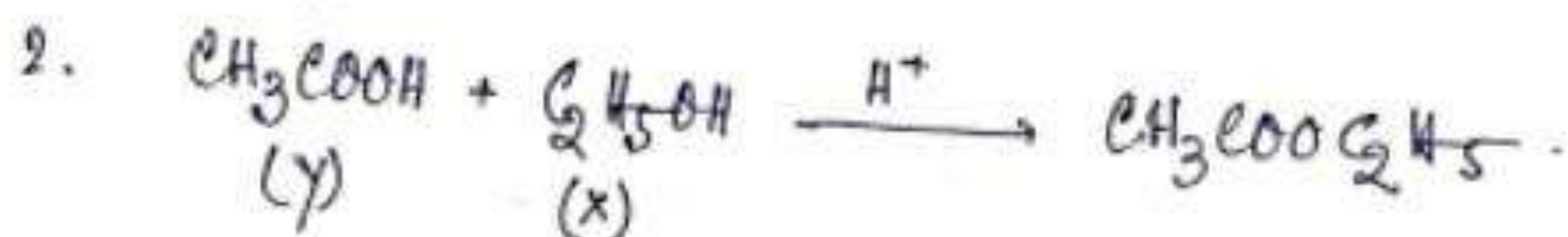
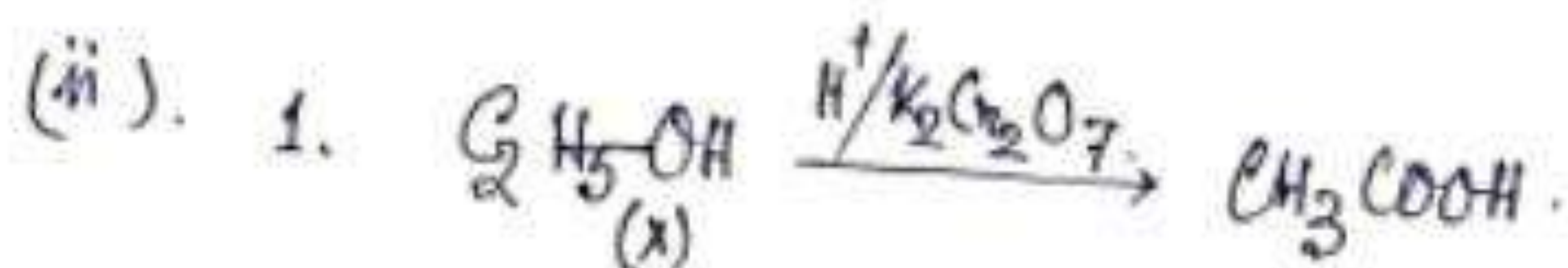
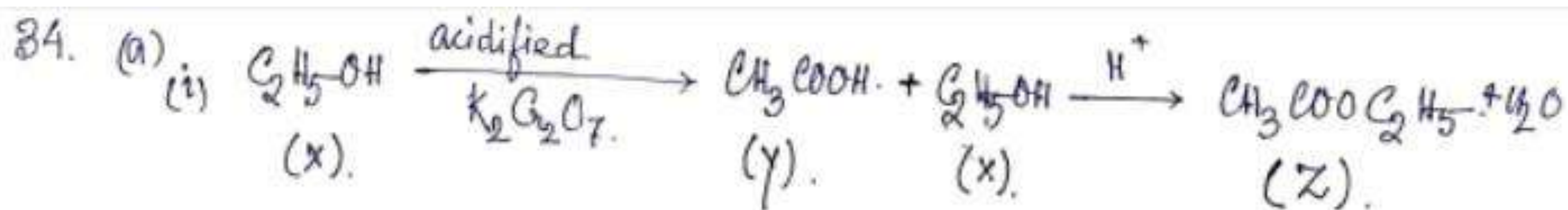


Damage to the ozone layer is a cause for concern because the harmful ultraviolet (UV) radiation from the sun will reach the earth. This radiation is highly damaging to organisms, for example, is known to cause skin cancer in human beings.

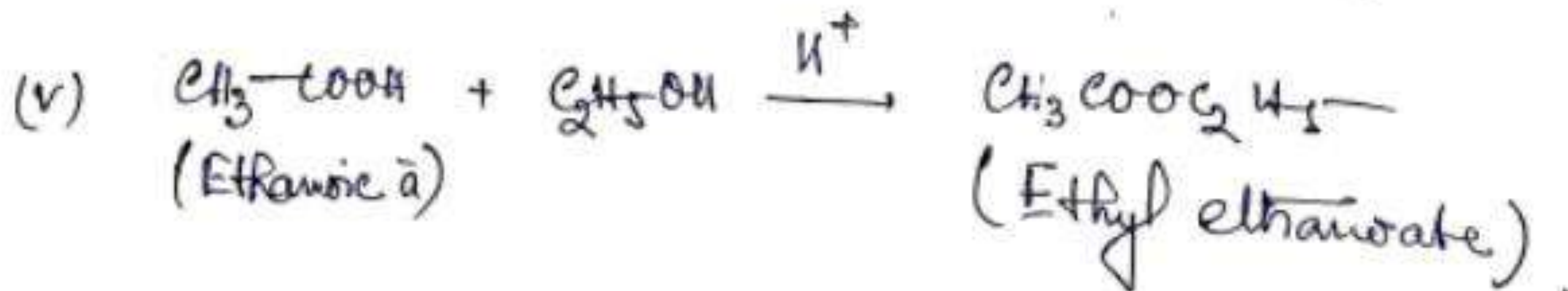
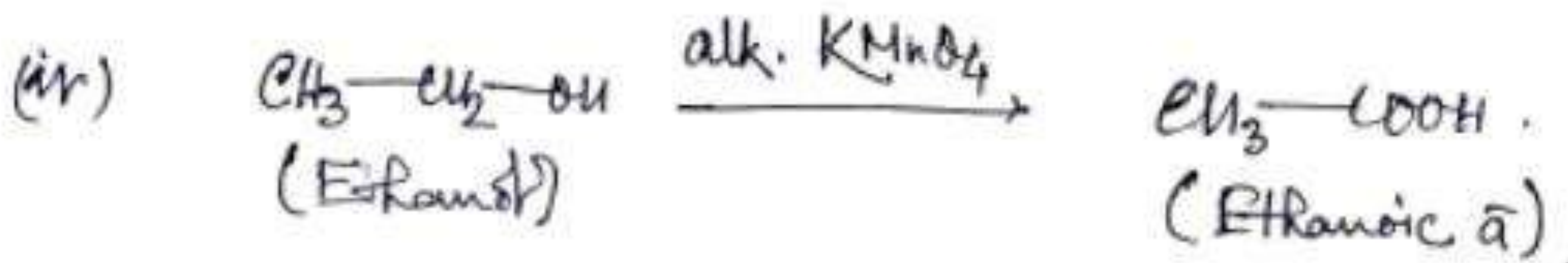
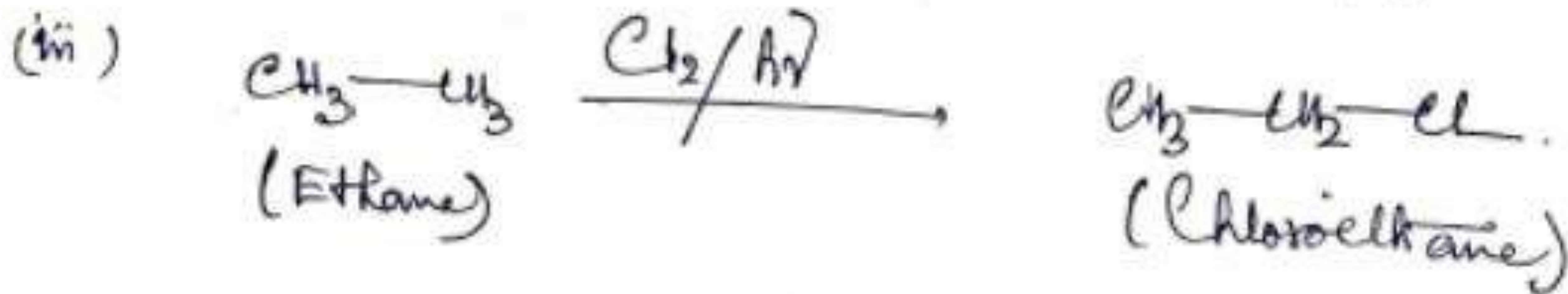
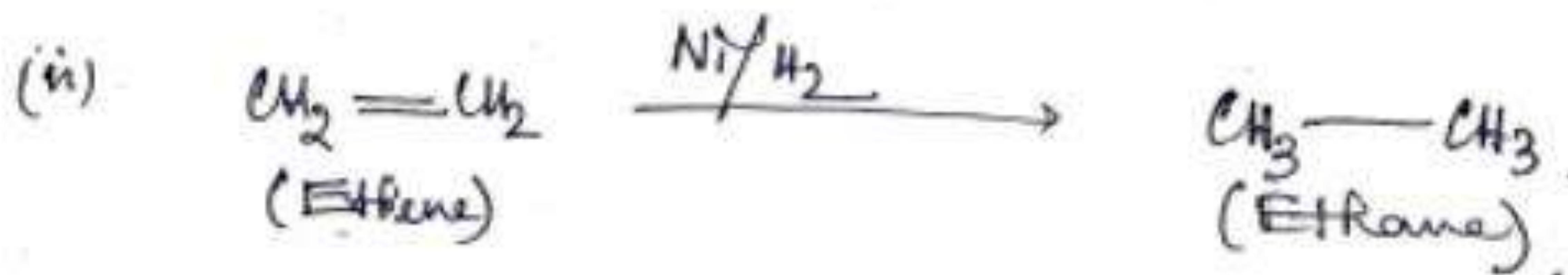
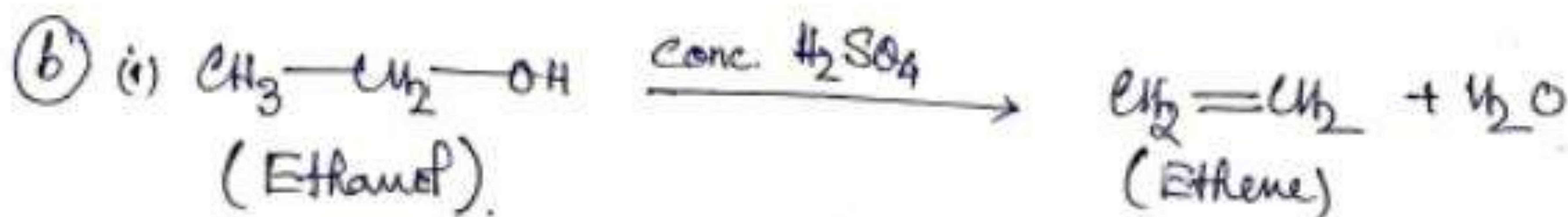
34. (a) A neutral organic compound 'X' (Molecular formula C_2H_6O) on reacting with acidified $K_2Cr_2O_7$ gives an organic compound 'Y' which is acidic in nature. 'X' reacts with 'Y' on warming in the presence of conc. H_2SO_4 to give a sweet smelling compound 'Z'.
- (i) Identify 'X', 'Y' and 'Z'.
 - (ii) Write the chemical equations for the reactions in the conversion of (1) 'X' to 'Y' and (2) 'X' to 'Z'.
 - (iii) State the role of (1) acidified $K_2Cr_2O_7$ in the conversion of 'X' to 'Y' and (2) conc. H_2SO_4 in the reaction of 'X' and 'Y'.
 - (iv) Name the reaction which occurs when 'Z' reacts with an alkali. 5

OR

- (b) Carry out the following conversions, stating the condition(s) for each : 5
- (i) Ethanol \longrightarrow Ethene
 - (ii) Ethene \longrightarrow Ethane
 - (iii) Ethane \longrightarrow Chloroethane
 - (iv) Ethanol \longrightarrow Ethanoic acid
 - (v) Ethanoic acid \longrightarrow Ethyl ethanoate



(iv) \rightarrow Esterification rxn.



35. (a) (i) Where are testes located in the human males and why ? State two function of the testes.
- (ii) In the human female, one of the ovaries releases an egg every month. State the changes that take place if
- (1) the egg is fertilized, and
 - (2) the egg is not fertilized.
- (iii) What is done during the surgical method in males and females to prevent pregnancy ?

5

OR

- (b) (i) What happens when :
- (1) Leaves of Bryophyllum fall on the soil ?
 - (2) Planaria is cut into many pieces ?
 - (3) Sporangia of Rhizopus on maturation liberate spores ?
- Mention the modes of reproduction in each of the above three cases.
- (ii) Write the changes that occur in a flower once the fertilisation has taken place.

5

Ans-35) (a)

(i) Testes are located in scrotum in males that is outside abdomen, as it provides less temperature than body for spermatogenesis. Testes gives rise to male gametes, sperms and male hormone, testosterone.

(ii) 1. when eggs are fertilised, it develops into zygote and gets implanted in uterus for further development. Corpus luteum is maintained in uterus for 9 months.

2. When eggs are not fertilised, it degenerates and corpus luteum degenerates which breaks the thickening of uterine endometrium causing menstruation.

(iii) in surgical methods of contraception, ends of duct system are cut and tied. In males, ends of vas deferens are cut and tied and in females, ends of fallopian tube are cut and tied that prevent gamete transfer. or

B. (i)

(1) when Leaves of Bryophyllum fall on the soil, buds develop from the ends of leaf lamina and grow into new plants. - Vegetative propagation

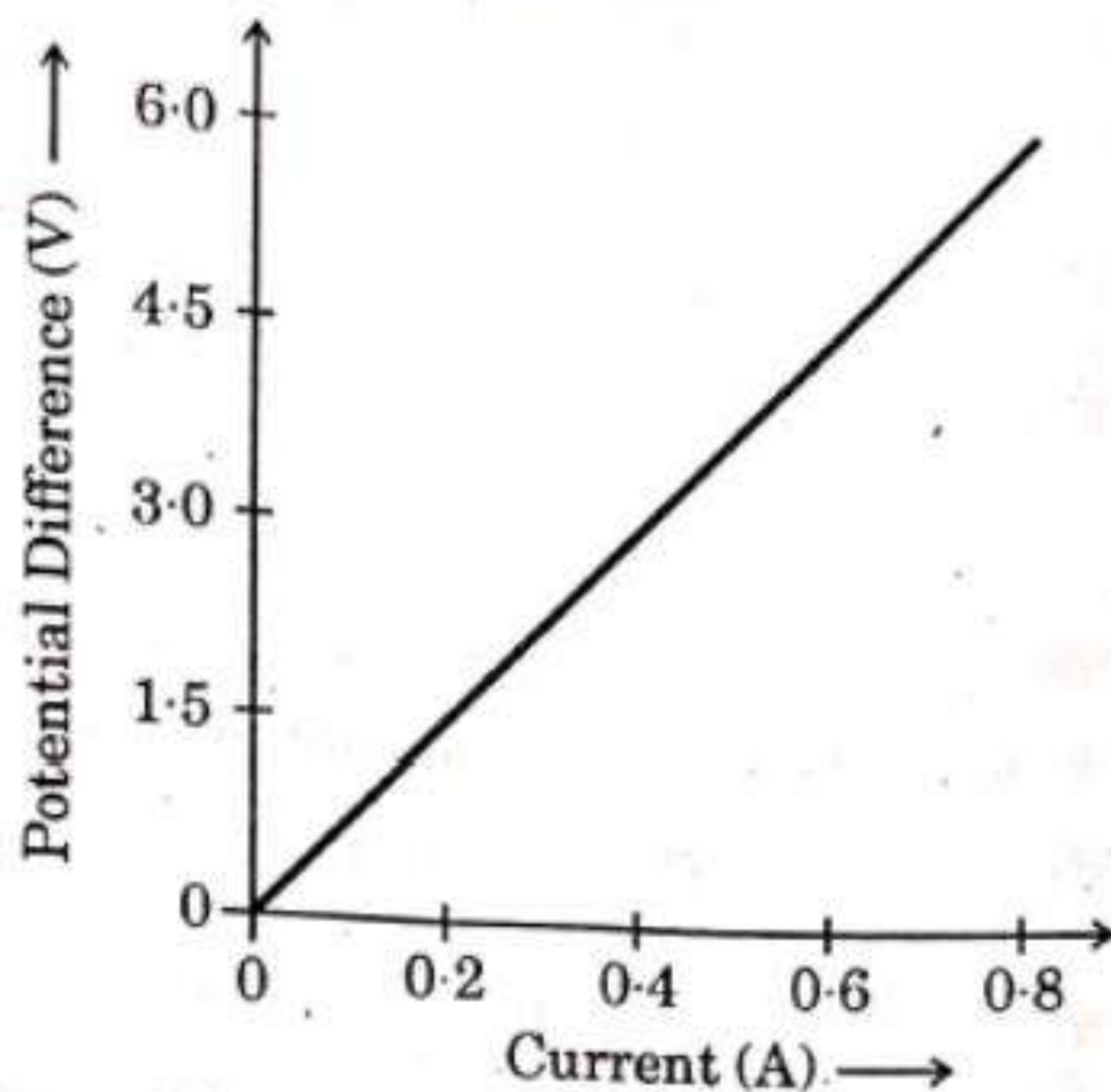
(2) when Planaria is cut into many pieces, each part of Planaria develops into a new part as it shows regeneration.

(3) when Sporangia of Rhizopus on maturation liberate spores, the spores remain in air during unfavourable conditions and then germinate into new hyphae when conditions are favourable.- spore formation

B. (ii) Flowers exhibit two changes after fertilization. The first change involves the rapid growth and conversion of the ovary into the fruit. The second change involves the formation of a tough coat around the ovule, which then changes into seeds.

36. (a) State Ohm's Law.

(b) Name and define the physical quantity determined by the slope of $V - I$ curve given in the diagram. Use this graph to find the value of this physical quantity in SI units.



(c) Establish the relationship between 1 kWh and 1 joule.

Q → 36(a) Ohm's Law:

↓ If the physical conditions of a conductor remain same then current through a conductor is directly proportional to the potential difference b/w two ends of the conductor.

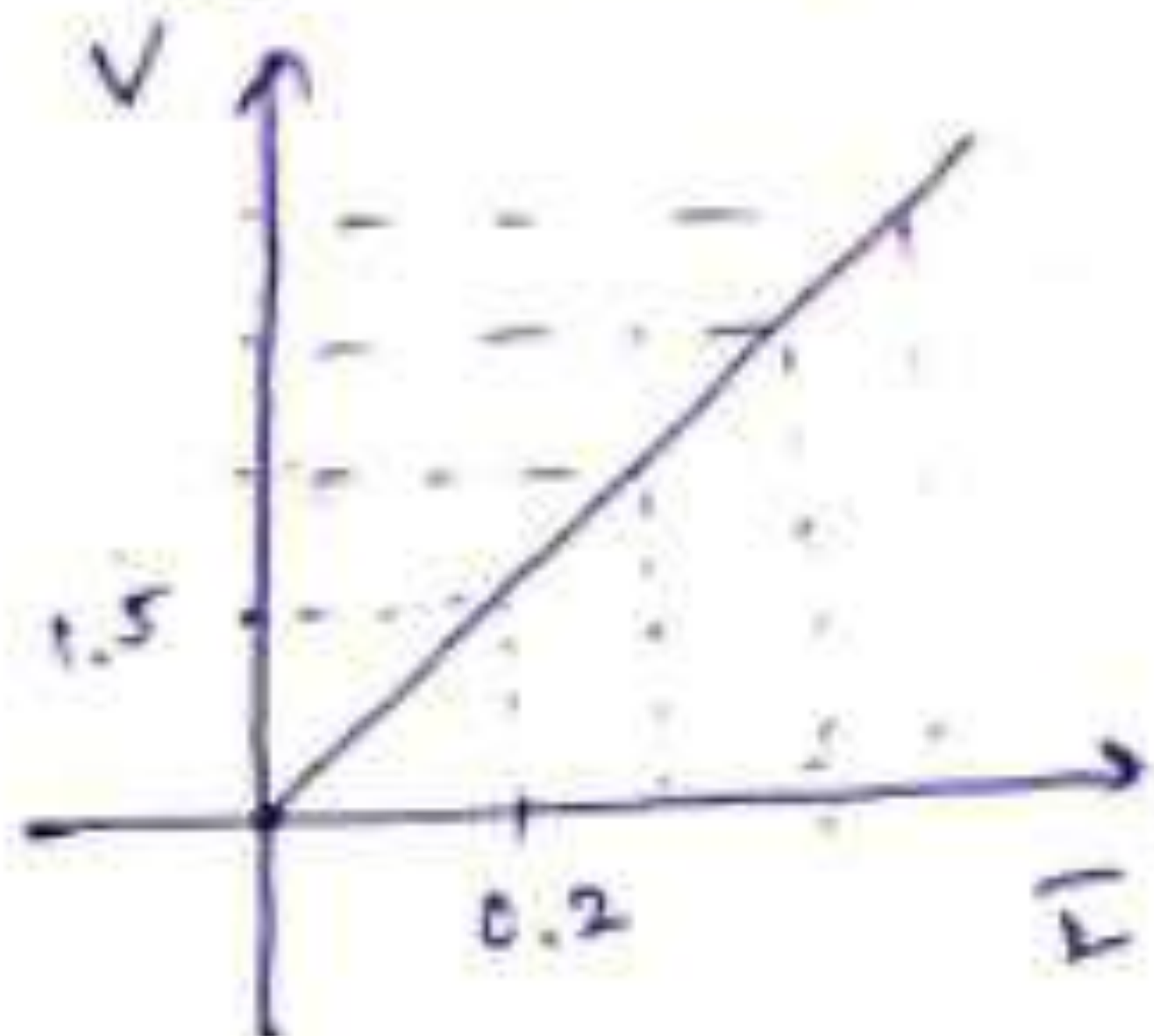
$$I \propto V$$

$$\therefore I = \left(\frac{1}{R}\right) V$$

$$\therefore \boxed{V = IR}$$

(b) Slope of $V \rightarrow I$ curve represents the value of Resistance.

$$\boxed{R = \frac{\Delta V}{\Delta I}}$$



$$\text{Slope} = \frac{\Delta V}{\Delta I}$$

$$\text{Slope} = \frac{1.5}{0.2}$$

$$= \frac{1.5}{2}$$

$$\boxed{R = 7.5 \Omega}$$

(c) 1 kWh :- If 1000 J energy is used in 1 sec then energy used in 1 hour will be $1 \text{ kWh} = 1000 \times 3600 = 3.6 \times 10^6 \text{ J}$.

37. Metals are required for a variety of purposes. For this we need their extraction from their ores. Ores mined from the earth are usually contaminated with many impurities which must be removed prior to the extraction of metals. The extraction of pure metal involves the following steps :

- (1) Concentration of ore
- (2) Extraction of the metal from the concentrated ore
- (3) Refining of the metal

(a) Name an ore of Mercury and state the form in which Mercury is present in it. 1

(b) What happens to zinc carbonate when it is heated strongly in a limited supply of air ? 1

(c) The reaction of a metal A with Fe_2O_3 is highly exothermic and is used to join railway tracks.

(I) Identify the metal A and name the reaction taking place.

(II) Write the chemical equation for the reaction of metal A with Fe_2O_3 . 2

OR

(c) We cannot use carbon to obtain sodium from sodium oxide. Why ? State the reactions taking place at cathode and anode during electrolytic reduction of sodium chloride. 2

37. (a) Ore \rightarrow Cinnabar (HgS).
Liquid in room temp.

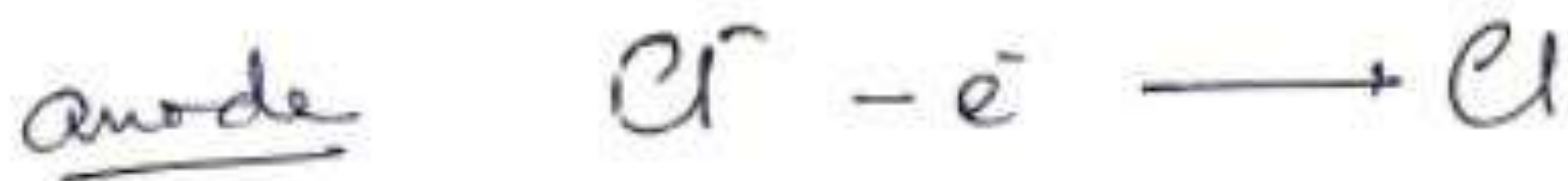
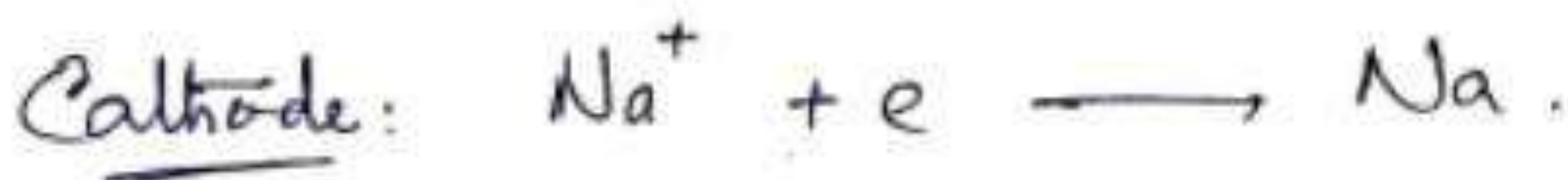
(b) Calcination: $\text{ZnCO}_3 \xrightarrow{\Delta} \text{ZnO} + \text{CO}_2$.

(c) (I) Aluminium (Al) \Rightarrow metal (A).
Thermite rxn.



(OR)

(c) Sodium oxide cannot be reduced by reducing agent because ~~oxide~~ is sodium being highly electropositive has a strong affinity towards oxygen and hence its compound is highly stabilized.



38. In some families, either rural or urban, females are tortured for giving birth to a female child. They do not seem to understand the scientific reason behind the birth of a boy or a girl. In fact the mother is not responsible for the sex of the child and it has been genetically proved that the sex of a newborn is determined by what the child inherits from the father.

- (a) State the basis on which the sex of a newborn baby is determined in humans. 1
- (b) Why is the pair of sex chromosomes called a mismatched pair in males? 1
- (c) How is the original number of chromosomes present in the parents restored in the progeny? 2

OR

- (c) Explain by giving two examples of the organisms in which the sex is not genetically determined. 2

Ans-38)

(a) the sex of a newborn baby is determined in humans is by chromosomal method. Males have 44+XY chromosomes while females have 44+XX chromosomes.

(b) As males have two different chromosomes X and Y, they are said to be mismatched pair, or heterozygous for sex chromosomes.

(c) the original number of chromosomes present in the parents restored in the progeny by fertilisation.

OR

(c) organisms in which the sex is not genetically determined:

Honeybee (haplodiploid method of sex determination)

Turtle (environmental)

39. Many optical instruments consist of a number of lenses. They are combined to increase the magnification and sharpness of the image. The net power (P) of the lenses placed in contact is given by the algebraic sum of the powers of the individual lenses $P_1, P_2, P_3 \dots$ as

$$P = P_1 + P_2 + P_3 \dots$$

This is also termed as the simple additive property of the power of lens, widely used to design lens systems of cameras, microscopes and telescopes. These lens systems can have a combination of convex lenses and also concave lenses.

- (a) What is the nature (convergent / divergent) of the combination of a convex lens of power + 4 D and a concave lens of power – 2 D ? 1
- (b) Calculate the focal length of a lens of power – 2.5 D. 1
- (c) Draw a ray diagram to show the nature and position of an image formed by a convex lens of power + 0.1 D, when an object is placed at a distance of 20 cm from its optical centre. 2

OR

- (c) How is a virtual image formed by a convex lens different from that formed by a concave lens ? Under what conditions do a convex and a concave lens form virtual images ? 2

[39]

$$P_1 = +4 \text{ D}, \quad P_2 = -2 \text{ D}$$

$$(a) \quad P_{eq} = P_1 + P_2$$

$$= 4 - 2$$

$$= 2 \text{ D}$$

↓
the combination will act as convergent lens of power 2 D.

$$(b) \quad P = -2.5 \text{ D}$$

$$\text{focal length} = \frac{1}{P}$$

$$= \frac{1}{-2.5}$$

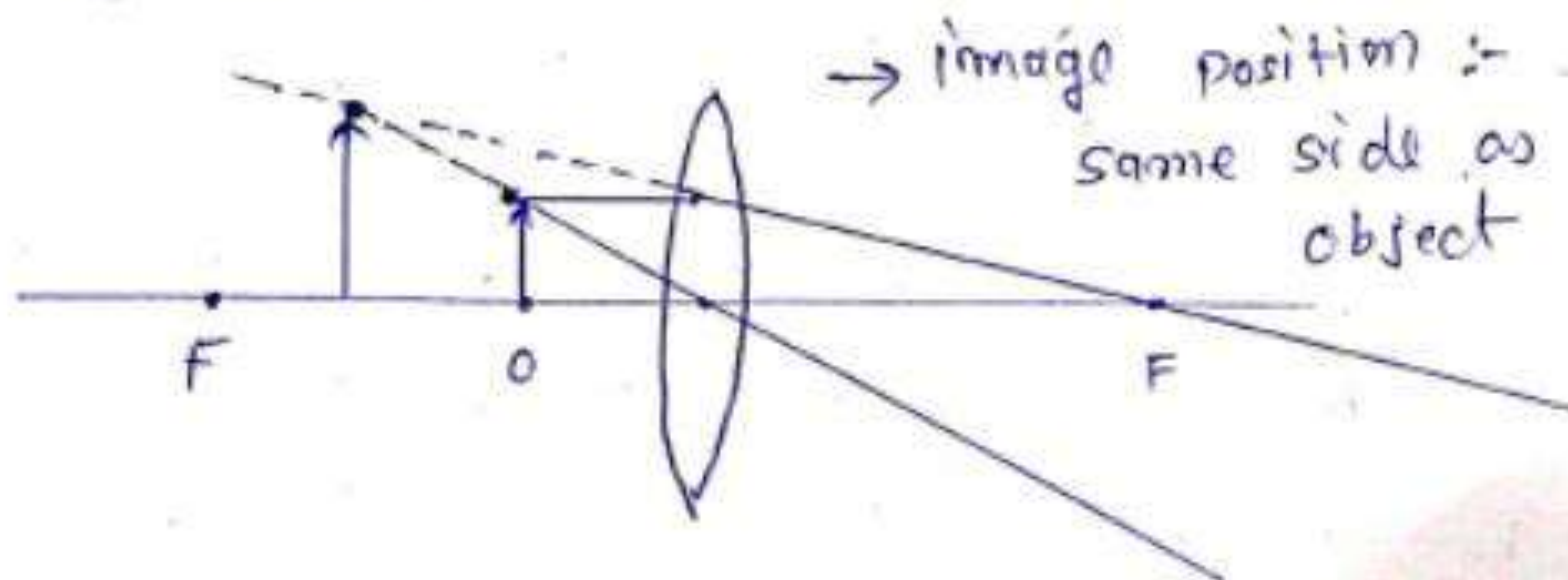
$$= -\frac{10}{2.5} = -\frac{2}{5} = -0.4 \text{ m}$$

$$\boxed{= -40 \text{ cm.}} \text{ ans.}$$

$$(c) \quad \text{power of lens} = +0.1 \text{ D}$$

$$\therefore \text{focal length} = \frac{1}{P} = \frac{1}{0.1} = 10 \text{ m} \\ = 1000 \text{ cm}$$

$$u = -20 \text{ cm.}$$



Nature of the image : virtual and erect.

For position: $v = ?$

According to lens formula,

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

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

$$\therefore \frac{1}{v} = \frac{1}{-20} + \frac{1}{1000} = \frac{1}{1000} - \frac{1}{20}$$

$$\therefore \frac{1}{v} = \frac{20 - 1000}{20 \times 1000} = \frac{-980}{20000}$$

$$\therefore v = -\frac{2000}{98} \text{ cm}$$

$$\therefore \boxed{v = -20.41 \text{ cm}}$$

OR

(c) The virtual image formed by convex lens is magnified in nature and by concave lens it is diminished.

→ Convex lens :

If we'll put an object between focus and optical centre of the lens it will give virtual image.

concave lens :

↓ For all the positions of ^{real} an object
concave lens will give virtual image.

