

SUBJECTIVE MOCK TEST | SCIENCE | SOLUTION

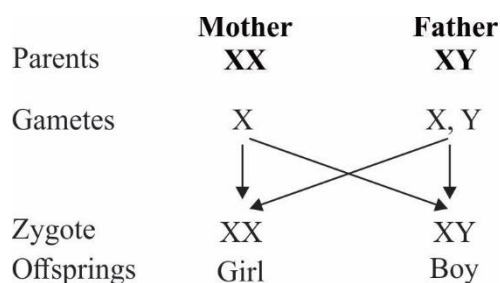
CLASS – X | SET - 1

(SECTION – A)

- 1.(B)
- 2.(C)
- 3.(D)
- 4.(D)
- 5.(C) Oxygen is natural oxidising agent
- 6.(C)
- 7.(B)
- 8.(C)
- 9.(D)
- 10.(C)
- 11.(C)
- 12.(A)
- 13.(A)
- 14.(B)
- 15.(A)
- 16.(D)
- 17.(D)
- 18.(D)
- 19.(B)
- 20.(B)

(SECTION – B)

21.



22. (i) **Testis**
(ii) **Ovary**

Hormone secreted by :

Testis - Testosterone

Ovary - Oestrogen/Progesterone

23. (a) Cloth bag is biodegradable/eco-friendly.
(b) (i) Segregation of biodegradable and non-biodegradable waste at source.

- (ii) By composting
- (iii) Recycling of solid wastes

24. (a) A = Potassium/K or Sodium/Na
 B = Calcium/Ca or Magnesium/Mg
 C = Aluminum/Al or Iron/Fe or Zing/Zn
 D = Lead/Pb or Copper/Cu or Silver/Ag or Gold/Au

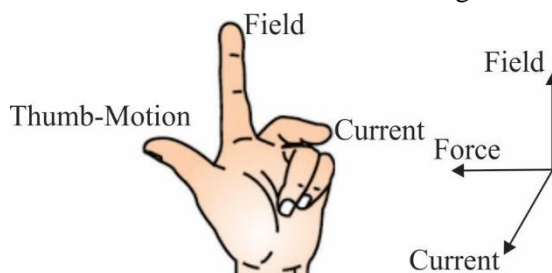
or

- (b) (i) (1) Sodium chloride-yellow
 (2) Calcium chloride-brick red(credit full marks for any other colour)

(ii) No

Justification : Because they are ionic or electrovalent compounds which are insoluble in organic solvents.

25. (a) According to Fleming's left hand rule, stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular to each other. If the first finger points in the direction of magnetic field and the second finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.



- (b) Into the plane of the paper (downward)

26. (a)

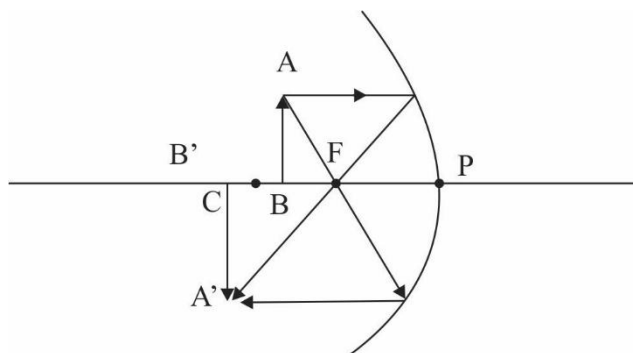
$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{-15} - \frac{1}{-20} = \frac{-1}{60}$$

$$v = -60\text{cm}$$

$$m = \frac{-v}{u} = \frac{-60}{-20} = -3$$

- (b)

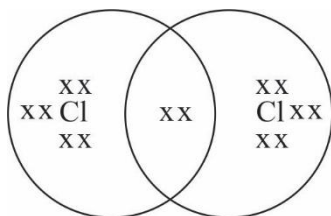


(SECTION – C)

27. (i) Exchange of gases through stomata.
 (ii) By the process of respiration.
 (iii) The guard cells absorb water and swell causing the stomatal pore to open
 (iv) The guard cells lose water and shrink and hence the pore closes.
28. (a) (i) The chemical properties are determined solely by the functional group, which remains the same for a particular homologous series.
 (ii) One carbon, two hydrogen/ CH_2
 (i) $\text{C}_2\text{H}_2 + \text{CH}_2 \rightarrow \text{C}_3\text{H}_4$
 (ii) $\text{C}_2\text{H}_5\text{OH} + \text{CH}_2 \rightarrow \text{C}_3\text{H}_7\text{OH}$
 (iii) $\text{CH}_3\text{CHO} + \text{CH}_2 \rightarrow \text{C}_2\text{H}_5\text{CHO}$

Or

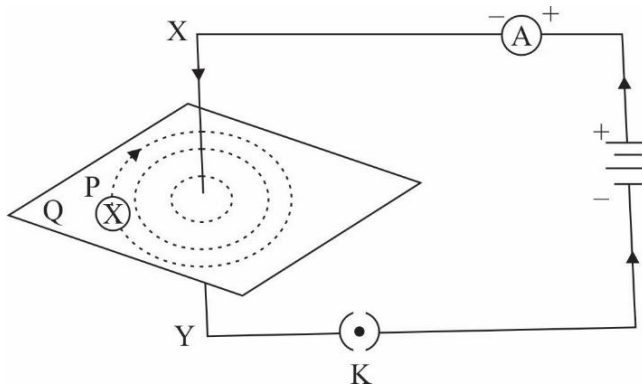
- (b) (i) (1) Small size of carbon atom enables the nucleus to hold on to the shared pair of electrons strongly.
 (2) Weak inter molecular forces of attraction
 (ii) $\text{Cl} = 17 = 2, 8, 7$



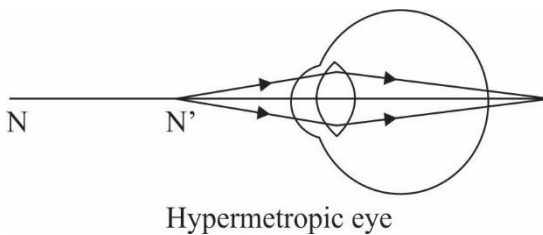
29. (a) Gastric glands
 Pepsin, Mucus, HCl
 (b) Emulsification of fats/Bile juice breaks fats into small globules
 It makes the food coming from the stomach alkaline for the pancreatic enzymes to act.
30. (a) (i) Solenoid : A coil of many turns of insulated copper wire wrapped closely in the shape of cylinder.
 Circular coil : Straight wire bent in the form of circular loop with many turns.
 (ii) By taking a non-conducting cylindrical tube and winding a long, insulated copper wire tightly over it in the shape of a spring such that the turns are closely placed and lie side by side.
 (iii) To magnetize a piece of magnetic material like soft iron/to make an electromagnet.

Or

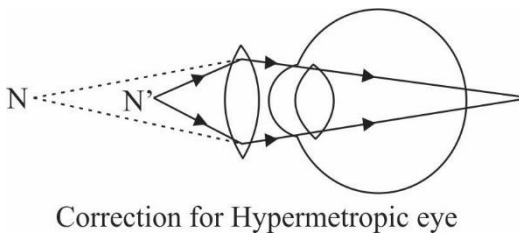
- (b) Right hand Thumb Rule: Imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field.



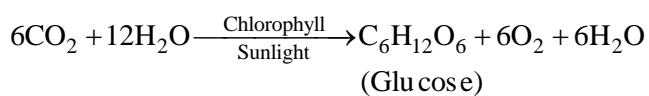
31. Hypermetropia/far sightedness.
By using a convex lens of appropriate power
(i)



(ii)



32. The process in which plants or autotrophs take in substances from outside and convert them into stored form of energy. The process in which carbon dioxide and water is converted into carbohydrates in the presence of sunlight and chlorophyll.



- Chloroplast
- Leaves/green part of the plant.
- Water
- Stored as starch

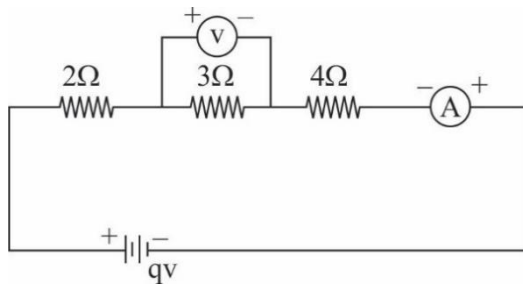
33. (a) (i) Forest/Ocean
(ii) Aquarium/Crop fields (or any other)
(b) (i) Algae → Mosquito larvae → small fish → Crane (Any other chain)
(ii) Producers
(iii) As only they can convert sunlight into food energy.

(SECTION – D)

34. (a) (i) (2) Magnesium hydroxide
 (ii) (2) Ca(OH)_2 and (4) NaOH
 (iii) NH_3 /Ammonia
 NH_4OH /Ammonium hydroxide
 (iv) To neutralize the effect of acid in the bee sting.
 (v) (1) Oxalic acid (2) Tartaric acid
 or
- (b) (i) It is the fixed number of water molecules present in one formula unit of salt.
 (ii) Hydrated copper sulphate/copper sulphate penta hydrate.
 $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
 (iii) CaOCl_2
 Chemical equation
 $\text{Ca(OH)}_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$
- User-1. For bleaching cotton and line in textile industry.
 2. As an oxidising agent in a chemical industry.
 3. For disinfecting water.
35. (a) (i) (1) Ovary
 (2) Oviduct/Fallopian tube
 (3) Lining of the uterus
 (ii) (1) Zygote is formed
 (2) When egg is not fertilized, egg lives for about one day, the lining of the uterus slowly breaks down and comes out through vagina along with blood and mucus.
- Or**
- (b) (i) (1) Unisexual flower - contains either stamens or pistil.
 eg: Papaya/ Water melon (any other)
 (2) Bisexual flower-contains both stamens and pistil
 eg: Hibiscus/mustard (any other)
- (ii) A-Pollen Grain
 B-Stigma
 C-Pollen tube
 D-Female germ-cell/egg cell
- (iii) Transfer of pollen is required for fusion of gametes. /
 Pollen needs to be transferred from the stamen to the stigma as it brings male germ-cell (Pollen) + female germ-cell (egg) together for fusion.

36. (a) (i) $R_s = R_1 + R_2 + R_3$
 (ii) $1/R_p = 1/R_1 + 1/R_2 + 1/R_3$

(b)



- (i) $R_s = 2\Omega + 3\Omega + 4\Omega = 9\Omega$
 $V = 9V$
 $I = \frac{V}{R_s}$
 $= \frac{9V}{9\Omega} = 1A$
 Ammeter reading = 1.0 A
 (ii) Potential difference across 3Ω resistor
 $V = I R = 1.0 \times 3.0\Omega = 3V$

(SECTION – E)

37. (a) Middle
 • Sulphides/Carbonates/Oxide (any one)

(b)

Roasting

Ore is heated in excess of air.
 This is used for sulphide ores.

Calcination

Ore is heated in the absence or limited supply of air.
 This is used for carbonate ores.

(c)

Galvanization - coating of iron object with a thin layer of zinc.
 Alloying-A mixture of two or more metals or a metal and a non-metal.

or

- (c) The reaction between aluminium and iron oxide is highly exothermic which forms molten iron which is used in welding cracked machine parts.
 $Fe_2O_3(s) + 2Al(s) \rightarrow 2Fe(l) + Al_2O_3(s) + \text{Heat}$

38. (a) Bony box/Cranium, fluid filled balloon
 (b) (i) Sensory neuron - pass information from receptors to spinal cord.
 (ii) Motor neuron-transmit information from spinal cord to effector organ/ muscle.
 (c) (i) Cerebellum/Hind Brain - Voluntary Action
 (ii) Medulla/Hind Brain - Involuntary Action

or

- (c) (i) Through Peripheral nervous system
(ii) Cranial nerves and Spinal nerves

39. (a) The refractive index of a medium with respect to air or vacuum / Absolute refractive index of a

$$\text{medium} = \frac{\text{speed of light in air(vacuum)}}{\text{speed of light in medium}}$$

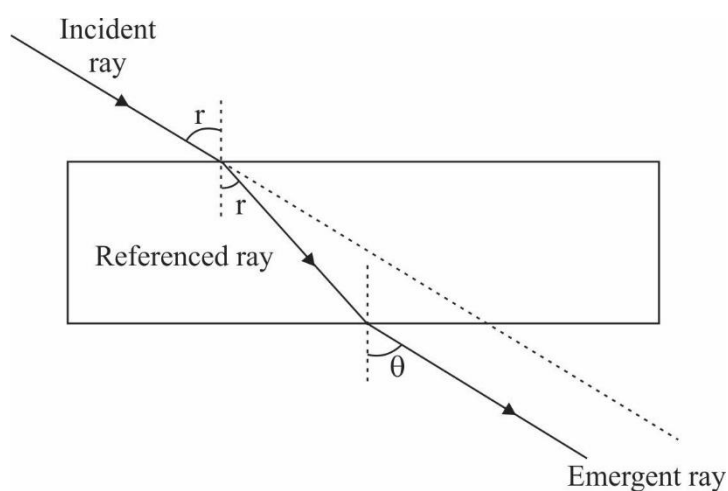
- (b) (i) speed of light is more in water
(ii) Bends away from normal

(c) Absolute refractive index of a medium = $\frac{\text{speed of light in vacuum}}{\text{speed of light in medium}}$

$$\frac{3}{2} = \frac{\text{speed of light in vacuum}}{2 \times 10^8}$$

or

(c)



SUBJECTIVE MOCK TEST | SCIENCE | SOLUTION

CLASS – X | SET - 2

(SECTION – A)

1. (B)
2. (B)
3. (D)
4. (A)
5. (B)
6. (D)
7. (C)
8. (B)
9. (A)
10. (C)
11. (C)
12. (C)
13. (D)
14. (C)
15. (A)
16. (A)
17. (D)
18. (A)
19. (D)
20. (C)

(SECTION – B)

21. Zinc is more reactive than Hydrogen, so, when Zinc granules will be added to dil HCl, they will replace Hydrogen in a single displacement reaction and Zinc Chloride will be formed.
The reaction has occurred can be confirmed by the following changes seen in the reaction mixture:
 - (i) Evolution of hydrogen gas which can be seen in the form of bubbles
 - (ii) A white colored precipitate of zinc chloride will be formed
22. Fertilization is the process of fusion of the female gamete (ovum or egg) and the male gamete produced in the pollen tube by the pollen grains.
Post-fertilization changes in a flower include-
 - (i) The diploid zygote develops into an embryo that forms the future plant.
 - (ii) The endosperm cells provides the required nutrition for the developing embryo.
 - (iii) The ovule forms the seed.
 - (iv) The ovary forms the fruit.
 - (v) The outer and inner integuments of the ovule forms the testa or the seed coat of the seed
 - (vi) Petals and sepals fall off

23. The purpose of making in the human body is to filter out nitrogenous waste products like urea and uric acid from the blood.

Organ that stores urine : Urinary bladder

Organ that releases urine : Urethra

or

The blood emerges from the ventricles of the heart and flows through the arteries. In order to bear this pressure the arteries have thick and elastic walls.

On the contrary, veins have valves to ensure that the blood flows in one direction only

24. (a) When light travels from an optically rarer medium to an optically denser medium it moves towards the normal. Since $n_B > n_A$ hence the light ray will bend towards the normal on passing from medium A to B.
- (b) The speed of the light will increase when the light travels from B to C, Since $n_C < n_B$ and $v = (c/n)$, the speed of the light ray will increase in the second medium.

25. Resistance of each part is $R/3 \Omega$

(as resistance is proportional to the length of the wire.)

$$\frac{1}{R_1} = \frac{3}{R} + \frac{3}{R} + \frac{3}{R} = \frac{9}{R}$$

$$\therefore R_1 = \frac{R}{9} \therefore \frac{R_1}{R} = \frac{1}{9}$$

or

The magnetic field strength is more in the region where the field lines are crowded. This means the field strength is maximum near the poles and it reduces as we go away from the poles.

26. (a) 10000J because only 10% of energy is available for the next trophic level.
- (b) No, since the loss of energy at each step is so great that very little usable energy will remain after 4 trophic levels.

(SECTION – C)

27. (a) The above reaction is known as a thermite reaction as the reaction is highly exothermic reaction. The metal (Mn/Fe) obtained will be in molten/liquid state.
- (b) Substance oxidised - Al(s)
Substance reduced - MnO_2 (s)
- (c) Aluminium is preferably used in thermite reactions as it is placed above Fe and Mn in reactivity series of metals.
Al is more reactive than Fe/Mn

28. $MCl_3; M_2(SO_4)_3$

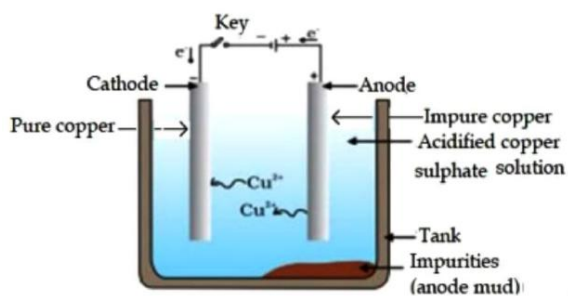
M in general forms an Ionic bond. It can acquire a stable electronic configuration of neon (2, 8) by losing its three valence electrons to form M^{3+} cation.

Compounds formed will conduct electricity in liquid/molten state but not in solid state in contrast to 'M'.

Or

'X' - Copper/Cu and 'Y' - CuO

Diagram to represent the process of refining of 'X'



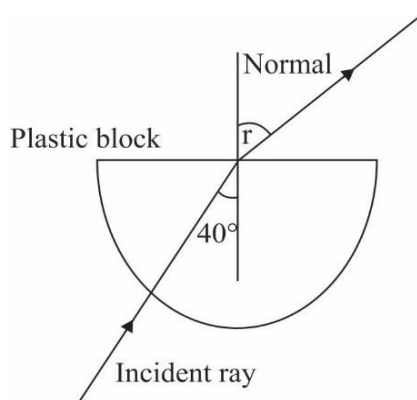
29. (i) Iodine is essential for the synthesis of thyroxin hormone.
(ii) Thyroxin regulates carbohydrate, protein and fat metabolism in the body.
(iii) Thyroxin provide the best balance for growth in the body.
30. There is a 50% chance that a girl may be born and a 50% chance that a boy may be born. It can be explained as follows:
- Most human chromosomes have a maternal copy and a paternal copy. We have 22 such chromosomes. One pair of chromosomes called sex chromosomes is odd in not always being a perfect pair. Women have a perfect pair of sex chromosomes, both called X. (XX)
 - But men have a mismatched pair of sex chromosomes in which one is a normal-sized X chromosome while the other is a short one called a Y chromosome. (XY)
 - A child receives one chromosome from the mother which is essentially the X chromosome.
 - A child who inherits an X chromosome from her father will be a girl, and one who inherits a Y chromosome from him will be a boy.

31. (i) The refractive index of a medium with respect to air is given by

$$= \frac{\text{speed of light in air}}{\text{speed of light in the medium}}$$

Since speed of light in the medium is always less than the speed of light in air, hence the above ratio is always greater than 1.

- (ii) The ray of light is undergoing normal incidence at the air-plastic block interface. And for normal incidence there is no deviation.
(iii)



32. Joules law of heating states that the heat dissipated across a resistor is directly proportional to
- The square of the current flowing through it
 - The resistance of the conductor
 - Duration of flow of current.

$$H = I^2 RT$$

33. (i) Anannya's answer is wrong. Electrical appliances with metallic bodies need an earth wire which provides a low resistance conducting path to the flow of current, in case there is an accidental leakage of current through the conducting body of the appliances.
- (ii) An electrical fuse is a safety device that operates to provide protection against the overflow of current in an electrical circuit. An important component of an electrical fuse is a metal wire or strip that melts when excess current flows through it.

(SECTION – D)

34. (a) Rehmat's observation is correct as the hydrogen atoms are substituted by hetero atom i.e., Cl

$$\text{CH}_4 + \text{Cl}_2 \rightarrow \text{CHCl}_3 + \text{HCl}$$
 (in the presence of sunlight)
 Other relevant equation in the chain reaction.

$$2\text{NaCl(aq)} + 2\text{H}_2\text{O(l)} \rightarrow 2\text{NaOH(aq)} + \text{Cl}_2\text{(g)} + \text{H}_2\text{(g)}$$

$$\text{NaCl} \rightarrow \text{Na}^+ + \text{Cl}^-$$

$$2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^- \text{ (At anode)}$$

$$\text{H}_2\text{O} \rightarrow \text{H}^+ + \text{OH}^-$$

$$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2 \text{ (At cathode)}$$

$$\text{Na}^+ + \text{OH}^- \rightarrow \text{NaOH}$$
- (b) Sodium hydroxide/ NaOH/Caustic soda
 Degreasing of metals
 Preparation of soaps and detergents
 Paper making
 Artificial fibres
Hydrogen
 Fuels
 Margarine
 Manufacture of ammonia for fertilizers
 X – Ethanoic acid/acetic acid/ CH_3COOH
 Y – Ethanol/Ethyl alcohol/ $\text{C}_2\text{H}_5\text{OH}$
 Z – Ethyl ethanoate/Ester – $\text{CH}_3\text{COOC}_2\text{H}_5$

$$\text{CH}_3 - \text{COOH} + \text{CH}_3 - \text{CH}_2\text{OH} \xrightarrow{\text{Add}} \text{CH}_3 - \underset{\text{O}}{\underset{\text{||}}{\text{C}}} - \text{O} - \text{CH}_2 - \text{CH}_3$$
 (Ethanoic acid) (Ethanol) (Ester)
35. (a) Sperm formation will be adversely affected because it requires a lower temperature than the body temperature.
- (b) Vas deferens is a passage for transfer of sperms, so sperms will not be transferred further.
- (c) When prostate and seminal vesicles are not functional, they will not add secretions for nourishment and medium for the transport of sperms.
- (d) When an egg is not fertilised in a human female, it lives for about one day. Then, the thickened lining of the uterus breaks leading to discharge of blood and mucus along with the unfertilised egg. This is called menstruation.
- (e) Nutrition and oxygen will not be provided to the growing embryo affecting its growth, which could have serious implications as well.

OR

- (a) Sameer is suffering from diabetes. In diabetes, there is rise in blood sugar level. The hormone responsible for this disease is insulin which is secreted from β -cells of pancreas.
- (b) Cytokinin is present in the areas of rapid cell division in a plant. Abscissic Acid inhibits the growth in plants.

36. (i) Convex lens

$$(ii) \quad \frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

In this case, $v = 7$ m and $f = 5$ m. Putting the values in the equation we get

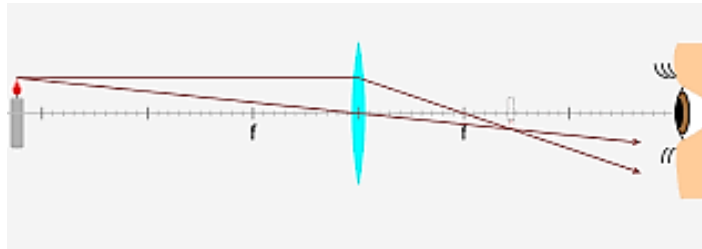
$$\frac{1}{5} = \frac{1}{7} - \frac{1}{u}$$

$$\frac{1}{u} = \frac{1}{7} - \frac{1}{5} = \frac{5-7}{35} = \frac{-2}{35}$$

$$u = -\frac{35}{2} = -17.5 \text{ m}$$

The object will be placed 17.5 m on the left of the convex lens.

(iii)



Two rays, arrows, object placed beyond $2f$ on the left.

OR

(i) Given, object distance (u) = -5 cm

Radius of curvature (r) = 40 cm

Image distance (v) = ?

$$\text{Focal length (f)} = \frac{r}{2} = \frac{40}{2} = -20 \text{ cm}$$

[f in case of a concave mirror is negative]

Using formula,

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

We get,

$$-\frac{1}{20} = \frac{1}{v} - \frac{1}{5}$$

$$\frac{1}{v} = -\frac{1}{20} + \frac{1}{5}$$

$$\frac{1}{v} = \frac{-1+4}{20} = \frac{3}{20}$$

$$\text{So, } v = \frac{20}{3} = 6.67 \text{ cm}$$

Hence, image is obtained at 6.67 cm behind the mirror.

- (ii) Size of object (h_o) = 10 cm

Size of the image (h_i) = ?

From formula,

$$m = \frac{h_i}{h_o} = -\frac{v}{u}$$

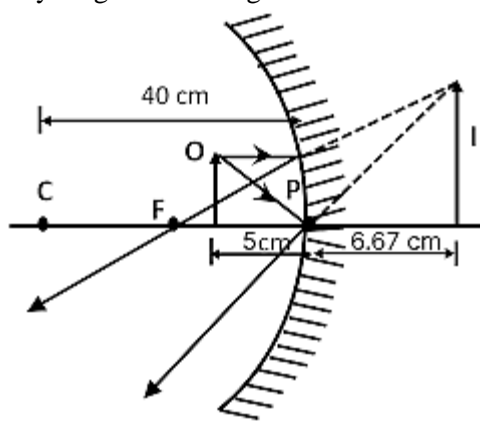
Substituting we get,

$$\frac{h_i}{10} = -\frac{6.67}{-5}$$

$$h_i = 10 \times \frac{6.67}{5} = 13.34 \text{ cm}$$

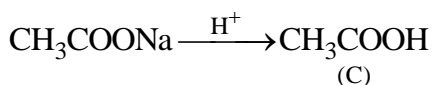
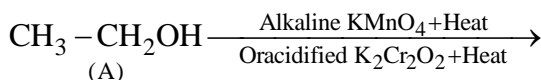
Hence, size of image is 13.34 cm

- (iii) Ray diagram showing the formation of the image is given below:



(SECTION – E)

37. (a) A – Ethanol ; F – Ethene



- (b) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow[\text{H}_2\text{SO}_4]{\text{Hot conc.}} \text{CH}_2 = \text{CH}_2 + \text{H}_2\text{O}$
- (A) (F)

or

Oxidation, Addition/Hydrogenation

Propanol, Propene

38. (a) Free ear lobe is dominant because it is found in a large majority of the population.
 (b) No. It is not sex linked. As per the data of the family as well as the class, it is indicated that free ear lobe is present in males as well as in females.
 (c) Father-Ff (free ear lobe), Mother -Ff (free ear lobe), Rahul – ff (attached ear lobe) and Nisha – Ff (free ear lobe)

OR

Suresh's father – ff (attached ear lobe), mother – ff (attached ear lobe), Suresh – ff (attached ear lobe), Siya – ff (attached ear lobe).

If both parents have recessive character, then all the children can have recessive character only.

39. (i) (a) 12Ω lamps (only) on.

- (b) 4Ω lamps (only) on.
- (ii) 12 V for both sets of lamps and all of them are in parallel.
- (iii) (a) 12Ω lamps are on when the wire is connected to position 2. The voltage across both
 12Ω lamps = 12 V.
 $V = IR$ (Ohm's law)
 $I = \frac{V}{R} = \frac{12}{12} = 1A$
- (b) 4Ω lamps are on when the wire is connected to position 3.
 The voltage across both 4Ω
 Lamps = 12 V
 $V = IR$ (Ohm's law)
 $I = \frac{V}{R} = \frac{12}{4} = 3A$

OR

(iv) $P = \frac{V^2}{R}$

All lamps are in parallel and hence the same V for all lamps.

For 4Ω lamps $\rightarrow P = \frac{12 \times 12}{4} = 36 \text{ W}$

For 12Ω lamps $\rightarrow P = \frac{12 \times 12}{12} = 12 \text{ W}$

Hence 4Ω lamps will have higher power.