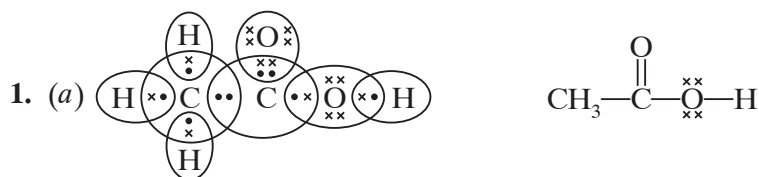


Answers to RSPL/3 (DS2)



2. By bringing each mirror one by one closer to our face,
 (a) if image is equal in size \longrightarrow Plane mirror
 (b) if image is large and erect \longrightarrow Concave mirror
 (c) if image is smaller and erect \longrightarrow Convex mirror

OR

The ratio of the height of image to the height of object is called lateral magnification. It is denoted by M

$$M = \frac{h_I}{h_O}$$

3. (a) Solar cookers, water heaters.

(b) Power = VI

$$V = 220 \text{ V}, \quad I = ?$$

$$P_1 = 4 \text{ kW} = 4000 \text{ W}$$

$$I_1 = \frac{P_1}{V} = \frac{4000 \text{ W}}{220 \text{ V}} = 18.2 \text{ A}$$

$$I_2 = \frac{P_2}{V} = \frac{7000 \text{ W}}{220 \text{ V}} = 31.8 \text{ A}$$

The current ranging from 18.2 A to 31.8 A can be produced.

- (c) (iv)
 (d) (ii)
4. (a) It protects the user from sexually transmitted diseases.
 (b) Oral pills contain certain hormones; by changing the hormonal balance of the body, they inhibit the release of ovum from the ovary and hence, fertilisation cannot occur.
 (c) Loops and copper-T.
 (d) It is misused to find the sex of the foetus followed by female foeticide.
5. (c) Soft iron
 6. (c) Vigilance mirror
 7. (a)
 8. (a)
 9. (c)
 10. (a)
 11. (c)

12. (c)

OR

(b)

13. (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

OR

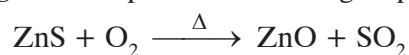
(d) The statement of the Assertion is false but the Reason is true

14. (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

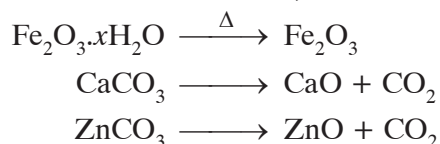
15. (a) Because hydrogen resembles both alkali metals and halogens.

(b) The electronic configuration of the element having atomic number 15 is 2, 8, 5. So, it lies in middle of 3rd period. This element has no tendency to loose its valence electrons. So, it is not a metal.

16. **Roasting:** It is the process of heating sulphide ores in presence of O₂ to form metal oxides.



Calcination: It is the process of heating carbonate ores or hydrated oxide ores in limited supply of air or absence of air, to form metal oxides.

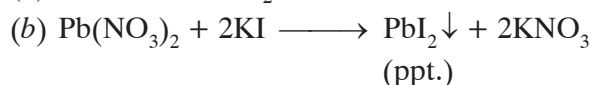


17. (a) Living organisms can survive only in certain pH range. When acid rain flows into rivers, it lowers the pH of the river water, making it difficult for aquatic life to survive.

(b) To prevent tooth decay caused due to the degradation of sugar and food particles by bacteria present in our mouth.

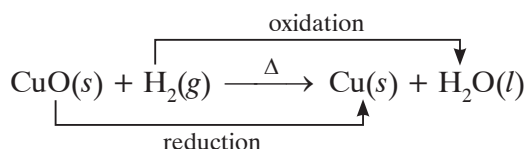
(c) During indigestion, stomach produces acid which causes pain and irritation. To get rid of this pain and to neutralise the excess acid, it is advised to take antacid which is a mild base.

18. (a) Lead iodide-PbI₂ is formed.



(c) Double displacement reaction.

OR



Substance oxidised – H₂

Substance reduced – CuO

Oxidant – CuO

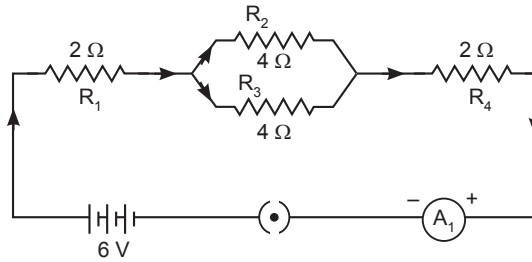
Reductant – H₂

19. (a) $R = R_1 + R_2 + R_3$
 $R = 3\ \Omega + 3\ \Omega + 3\ \Omega = 9\ \Omega$

(b) Series combination

(c) $V = IR, V = 6\ \text{V}, R = 9\ \Omega$
 $I = \frac{V}{R} = \frac{6}{9} = \frac{2}{3} = 0.67\ \text{A}$

OR



2 resistances R_2 and R_3 of $4\ \Omega$ each are connected in parallel, so

$$\frac{1}{R_p} = \frac{1}{4} + \frac{1}{4} = \frac{2}{4}$$

$\therefore R_p = \frac{4}{2} = 2\ \Omega$

$$R_s = 2 + 2 + 2 = 6\ \Omega$$

Since, R_1, R_p and R_4 are in series, so effective resistance will be

$$\text{Total, } R = 6\ \Omega$$

$$V = 6\ \text{V}$$

$$\text{Total, } I = \frac{V}{R} = \frac{6}{6} = 1\ \text{A}$$

$$I \text{ through } R_1 = \frac{V}{R_s} = \frac{6}{6} = 1\ \text{A}$$

$$I \text{ through } R_2 = 0.5\ \text{A}$$

$$I \text{ through } R_3 = 0.5\ \text{A}$$

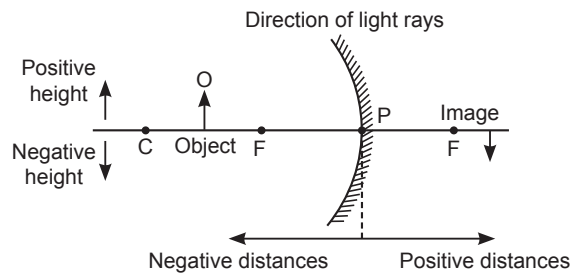
$$I \text{ through } R_4 = 1\ \text{A}$$

20. (a) $P = VI$

(b) $P = I^2R$

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

21.



$$f = -ve$$

$$u = -ve$$

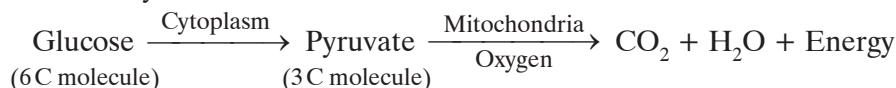
$$v = -ve \text{ for real image and } +ve \text{ for virtual image}$$

$$\text{Height of object} = +ve$$

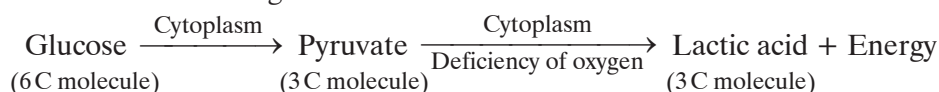
$$\text{Height of real image} = -ve$$

$$\text{Height of virtual image} = +ve$$

22. (a) (i) In our body cells under normal conditions



- (ii) In muscle cells during strenuous exercise



- (b) Since the oxygen dissolved in water is very less, aquatic animals breathe faster to obtain sufficient oxygen.

23. (a) Sustainable development refers to the forms of growth/development that meet the current basic needs of humans, while preserving the resources for the needs of future generations.

- (b) Management of natural resources

- (i) It requires a long-term perspective, so that these resources will last for the generations to come and will not be exploited for short-term gains.
- (ii) The management should ensure equitable distribution of resources, so that all are benefitted from the developments.
- (iii) The management should take into consideration the damage caused to the environment while exploiting these natural resources. (any two)

OR

- (a) 500,000 J

- (b) – Decomposers are those microbes (some bacteria and some fungi), which breakdown the complex organic molecules into simple inorganic substances, that can be used by the plants as nutrients.

- They play a vital role in

- (i) natural replenishment of soil with nutrients.
- (ii) disposal of the garbage and dead bodies of plants and animals.

24. (a) – Fossils are the impressions/traces and/or remnants of the organisms that lived in the past.

- Fossils help in the study of evolution as follows:

- They indicate the time period in the history of earth, when different species lived.
- They show the evolutionary history of organisms.
- Analysis of the organ structure in fossils allows us to make estimates of evolutionary relationships among different organisms.

- (b) Age of the fossil is calculated by
- detecting the ratios of different isotopes of the same element in the fossil material.
 - digging the earth and finding the layers of earth, where the fossils are found, i.e. those nearer to the earth surface are more recent than those found in the deeper layers.
25. (a) We see an object only when its image is formed on retina. Our retina has a large number of light-sensitive cells called rods and cones. Rods respond to intensity of light while cones respond to colours.
- (b) (i) Colour blindness is the defect of the eye due to which a person is not to distinguish between certain colours.
- (ii) It is genetic disorder. It occurs due to inheritance.
- (c) Myopia

OR

- (a) (i) $P = -3.5\text{ D}$

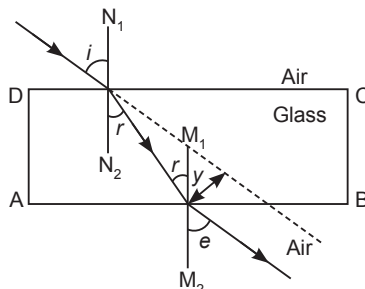
$$f = \frac{1}{P} = \frac{1}{-3.5} = -0.29\text{ m} = -29\text{ cm}$$

- (ii) $P = +0.5\text{ D}$ is used for correction.

$$\text{Total power} = -3.5 + 0.5\text{ D} = -3.0\text{ D}$$

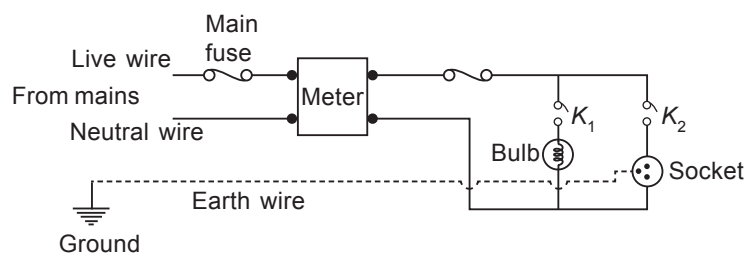
$$f = \frac{1}{D} = \frac{1}{-3} = -0.33\text{ m} = -33\text{ cm}$$

- (b)



- Refraction takes place at both parallel surfaces.
- For air-glass interface, $\angle r < \angle i$.
- At the second parallel surface, i.e. at glass-air interface, $\angle e > \angle r$.
- The emergent ray is parallel to the incident ray.
- Angle of emergence ($\angle e$) = Angle of incidence ($\angle i$).

26. (a)



The wiring of the household electric circuits:

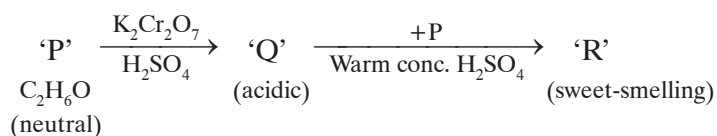
- (i) Household electric supply consists of 3 types of wire. Live wire (red insulation cover), neutral wire (black insulation cover) and earth wire (green insulation cover).
- (ii) The potential difference between neutral and live wire is 220 V.
- (iii) In household circuit system, two type of circuit are used. One of 15 A for appliances with higher power ratings and the other of 5 A ratings for bulbs etc.
- (iv) In domestic circuit, different appliances are connected in parallel combination.
- (v) The earth wire is used as a safety measure, especially for those appliances that have a metallic body.

Working of earth wire

The metallic body is connected to the earth wire, which provides a low resistance-conducting path for the current. It ensures that any leakage of current to the metallic body of the appliance will flow to the earth only and the user may not get a severe shock.

- (b) (i) Never touch any electrical appliance with wet hands.
- (ii) Wear gloves and slippers.

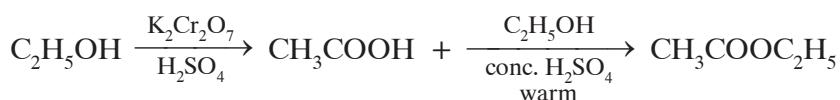
27. (i) $\begin{array}{c} \text{CH}_2-\text{CH}_2 \\ | \quad | \\ \text{Br} \quad \text{Br} \end{array}$ (ii) 2HCHO
- (iii) CH₃CH₂OH (iv) CO₂ + 2H₂O
- (v) CH₃COONa + H₂O + CO₂

OR

'P' – CH₃CH₂OH (ethanol)

'Q' – CH₃COOH (ethanoic acid)

'R' – CH₃COOC₂H₅ (ethyl ethanoate)



28. (a) NO₂ – nitrogen dioxide

O₂ – oxygen

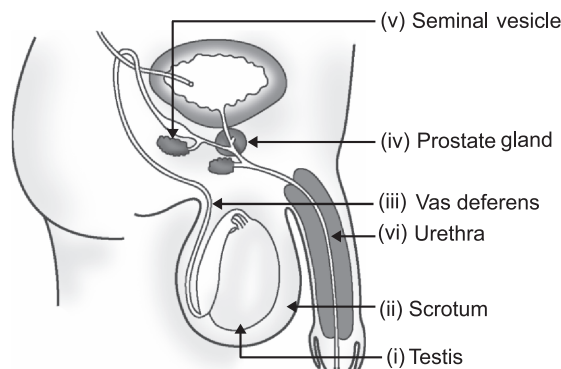
- (b) Thermal decomposition



- (d) We will test the evolution of O₂ by bringing a burning candle near the mouth of the boiling tube. The flame will intensify and the candle will continue burning indicating O₂ gas.

- (e) PbO, Lead oxide.

29. (a)



Human Male Reproductive System

- (b) – Since the ovary releases one egg every month, the uterus also prepares itself every month to receive a fertilised egg.
- Consequently, its lining becomes thick and spongy and it is richly supplied with blood vessels, to nourish the embryo.
 - But, if fertilisation does not occur, this thickened and spongy lining of the uterus is not needed; so it slowly breaks down along with its blood vessels and menstruation occurs.

30. (a) **Differences:**

Voluntary actions	Involuntary actions
– These are the thought-out actions that can be controlled at our will.	– These are the actions which cannot be controlled at our will.
– They are controlled by the fore-brain.	– They are controlled by the mid-brain and hind-brain.
– They generally involve the voluntary or skeletal muscles.	– They generally involve the involuntary or smooth muscles.
– They may be slow or fast, but not rhythmic.	– They are slow and rhythmic.

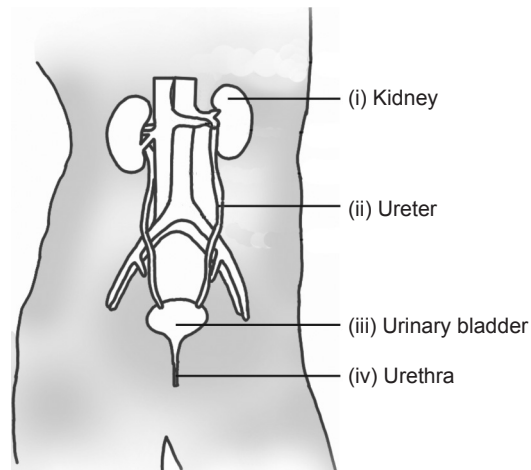
(b) Hydrotropism is the growth movement that occurs in plants in response to water, either towards or away from water.

(c) Response to Adrenaline

- When adrenaline is secreted into the blood, it reaches all parts of the body.
- It stimulates its target organ, the heart.
- Consequently, the heart beats faster leading to increased supply of oxygen to body muscles.
- The blood supply to digestive system and skin is reduced, as the muscles around the small arteries contract; the blood is diverted to the skeletal muscles.
- The breathing rate increases due to contraction of diaphragm and rib muscles.
- All these changes/responses together enable the body to be ready to deal with the situation.

OR

(a)



Human Excretory system in human beings

(b) Excretion in plants:

- (i) Plants get rid of carbon dioxide and oxygen through stomata.
- (ii) Excess water is lost as water vapour through stomata, i.e. transpiration.
- (iii) Some waste materials are stored in leaves that fall off.
- (iv) Waste products such as gums and resins are stored in the old xylem elements.
- (v) Plants excrete some waste substances through roots into the soil around them.
- (vi) Plants use the dead tissues/cells for storing their wastes.
- (vii) Some waste products are also stored in the vacuoles of the cells. (any four)

(c) With the residual volume of air in the lungs, there is sufficient time for oxygen to be absorbed into the blood and carbon dioxide to be released from the blood into the lungs.