Time : 3 Hours
Maximum Marks : 80

SCIENCE
CBSE
Marking Scheme
(Issued by Board)

Solution of Question Paper 1

Section 'A'

1. Hibiscus/Mustard (or any other correct answer) 1

2.

Pepsin	Trypsin
(i) Produced in stomach	Produced by pancreas
(ii) Acts in acidic medium	Acts in basic medium

(Any one) 1

3. Atomic number of X = Mass number of X – No. of neutrons = 35 – 18 = 17 1
Electronic configuration = 2, 8, 7 ½
Group number = 17 , Period No. = 3 ½

4. $h_o = 1.2$ cm, $f = -20$ cm, $v = -60$ cm ½

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

$$\frac{1}{u} = \frac{1}{-20} - \frac{1}{-60} = \frac{1}{60} - \frac{1}{20} = \frac{1-3}{60} = \frac{-2}{60}$$ ½

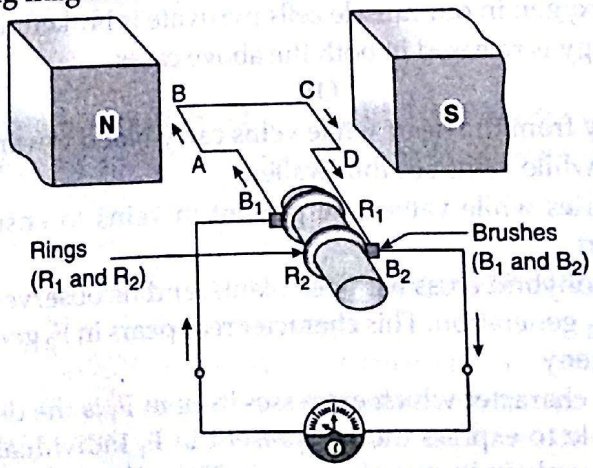
$$= u = -30$$ ½

$$\frac{h_i}{h_o} = \frac{-v}{u}$$ ½

$$h_i = -\frac{-60}{-30} \times 1.2 = -2.4 \text{ cm}$$ ½

5. (i) Our demand for energy is increasing to improve quality of life and growth of population.
(ii) Fossil fuels are limited. (Or any other two) 1 + 1 ½

6. Electric generator
Principle : Electromagnetic induction, which states that electric current is induced in a closed circuit because of changing magnetic field. 1



1½

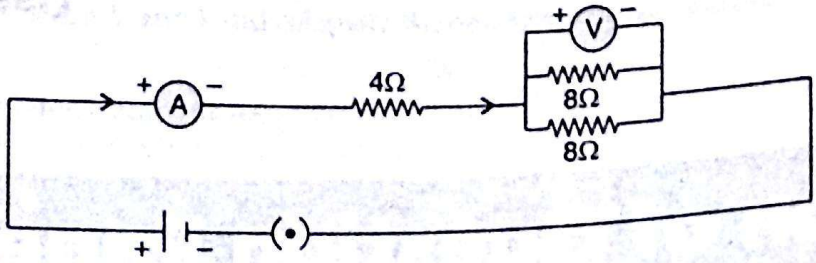
OR

(i) Earth wire in electrical instruments saves us from all possible electric shocks.

(ii) Accidentally, when live and neutral wires of an electric circuit comes into direct contact, it is called short circuiting.

(iii) (a) 5A, (b) 15A **1 + 1 + 1**

7.



1

Maximum current through 4 Ω resistor $= \sqrt{\frac{P}{R}}$ **1**

$= \sqrt{\frac{16}{4}} = 2$ A

$\therefore$ Maximum current through each 8 Ω resistor $= \frac{1}{2} \times 2 = 1$ A **1**

8. **(a)** In the electrolysis of water, the gas collected at cathode is : Hydrogen
The gas collected at anode is : oxygen

(b) The gas which is collected in double the amount during the electrolysis of water is Hydrogen. This is because water contains two parts of hydrogen element as compared to one part of oxygen element by volume. **1**

(c) Pure water is a bad conductor of electricity, by adding drops of sulphuric acid; we make it a good conductor of electricity. **1**

9.

S. No.	Mendeleev's Periodic table	Modern periodic table
1.	The elements were arranged according to increased atomic masses.	The elements were arranged according to increased atomic numbers.
2.	Position of isotopes was not justified.	There was no problem in the placing of isotopes
3.	Position of hydrogen was not justified because it resembles both with Alkali metals and Halogens.	Hydrogen has been given a unique position due to its resemblance with alkalies and Halogens.

1 × 3

10. There are two ways of anaerobic breakdown of glucose. First step is breakdown of glucose molecule into pyruvate which takes place in cytoplasm.
The anaerobic breakdown in bacteria is called fermentation. During fermentation pyruvate is broken down to ethyl alcohol and carbon dioxide.
When there is a lack of oxygen in our muscle cells pyruvate is broken down to lactic acid.
Very less amount of energy is released in both the above cases. **1 × 3**

OR

Arteries carry blood away from the heart while veins carry blood towards the heart.
Arteries are thick walled while veins are thin walled.
Valves are absent in arteries while valves are present in veins to ensure that blood flows in one direction only. **(Any other)** **(Any three) 1 × 3**

11. Mendel conducted a monohybrid cross with pea plants, and he observed that one of the contrasting characters disappears in F_1 generation. This character reappears in F_2 generation (obtained by selfing F_1) in just 25% of the progeny.
Mendel conclude that the character which expresses itself in F_1 is the dominant character while the other one which is not able to express though present in F_1 individual is recessive. This recessive character is able to express only in its pure form *i.e.* in 25% of F_2 individuals. **½ × 6**

12. (i) 1½

$u = 50 - 26 = 24$ cm

$\therefore$ $v = 74 - 50 = 24$ cm

$\therefore$ $2f = 24$ cm

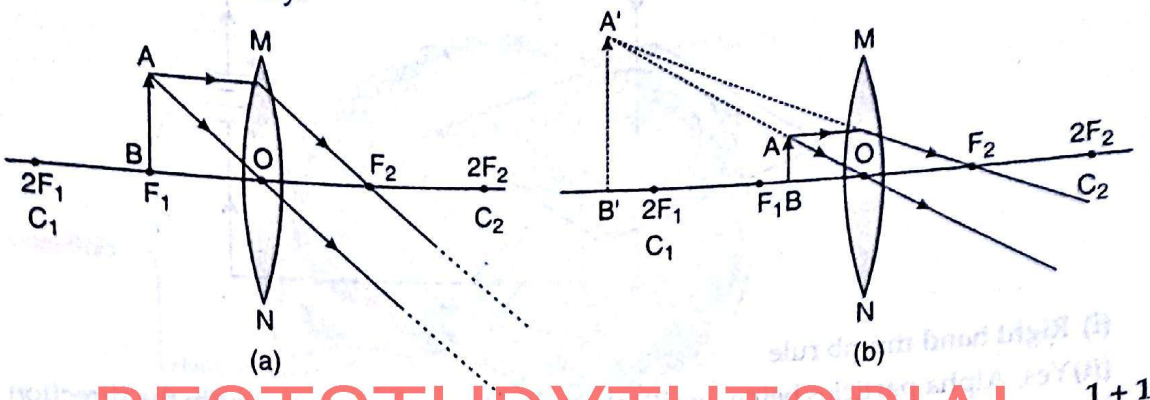
$f = \frac{24}{2} = 12$ cm

(ii) ½

i.e., Candle is at f $u = 50 - 38 = 12$ cm

$\therefore$ Image is formed at infinity. 1

(iii)



1 + 1 + 1

13. **Any three points given below :**
    1. **Plants and animals are pH sensitive :** Living organisms can survive only in narrow range of pH change.
    2. **pH of the soil :** Plants require a specific pH range for their healthy growth.
    3. **pH in our digestive system :** Our stomach produces hydrochloric acid that helps in the digestion of food. During in digestion the stomach produces too much acid that cause pain and irritation.
    4. **Change in pH causes tooth decay :** Tooth decay start when the pH of the mouth is lower than 5.5. Tooth enamel gets corroded when the pH in the mouth is below 5.5.
    5. **Self-defense by plants and animals through chemical warfare :** Bee-sting leaves and acid causing pain and irritation. Applying a mild base like baking soda on the stung area provides relief.

    (Any three) 1 + 1 + 1

OR

The name of the compound is Plaster of Paris ½

Its chemical formula is $CaSO_4 . ½ H_2O$ ½

Equation :

$CaSO_4.2H_2O \longrightarrow CaSO_4 . ½ H_2O + 1½ H_2O$ 1

It is used in the hospitals mainly as plaster for supporting fractured bones in the right position 1

14. Fossils provide evidence in favour of evolution / establish evolutionary relationships by providing missing links.

    Two ways :
    1. Relative method – Fossils found closer to the surface are more recent than those in deeper layer.
    2. By detecting the ratios of different isotopes of the same element in the fossils material. 1 × 2

15. (a) Viral / STD (Sexually Transmitted Disease) 1

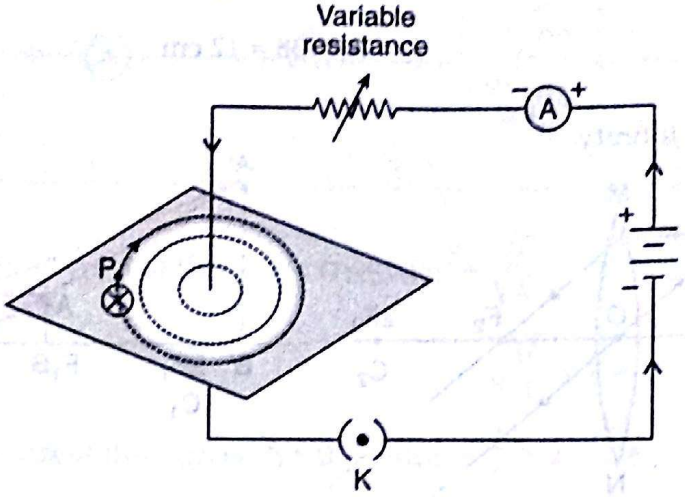
    HIV (Human Immunodeficiency Virus) 1

    (b) Sensitivity and awareness among the citizens towards leading a healthy and fit life. 1

16. Activity (Refer circuit diagram given on next page)

    Take a battery (12 V), a variable resistance (or a rheostat), an ammeter (0–5 A), a plug key, and a long straight thick copper wire. Insert the thick wire through the centre, normal to the plane of a rectangular cardboard. Take care that the cardboard is fixed and does not slide up or down. Connect

the copper wire vertically between the points X and Y, as shown in diagram in series with the battery, a plug and key. Sprinkle some iron filings uniformly on the cardboard. Keep the variable of the rheostat at a fixed position and note the current through the ammeter. Close the key so that a current flows through the wire. Ensure that the copper wire placed between the points X and Y remains vertically straight. Gently tap the cardboard a few times. Observe the pattern of the iron filings. It is observed that the iron filings align themselves showing a pattern of concentric circles around the copper wire. These represent the magnetic field lines. 2



1

(i) Right hand thumb rule

(ii) Yes, Alpha particles being, positively charged constitutes a current in the direction of motion.
No, Neutron being electrically neutral constitute no current. 2

17. C_6H_{14}

(a) $CH_3-CH_2-CH_2-CH_2-CH_2-CH_3$

(b) $CH_3-CH(CH_3)-CH_2-CH_2-CH_3$

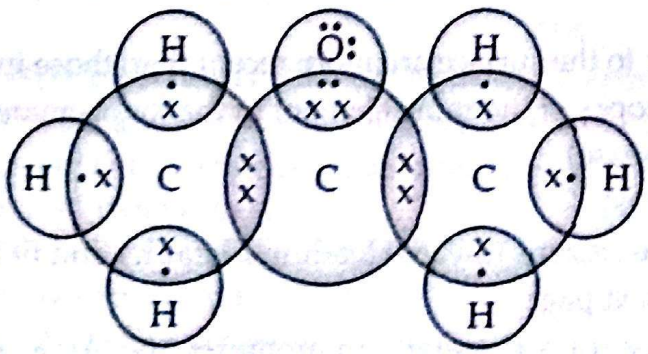
(c) $CH_3-CH_2-CH(CH_3)-CH_2-CH_3$

(d) $CH_3-CH(CH_3)-CH(CH_3)-CH_3$

(e) $CH_3-C(CH_3)_2-CH_2-CH_3$

1 + 1 + 1 + 1 + 1

OR

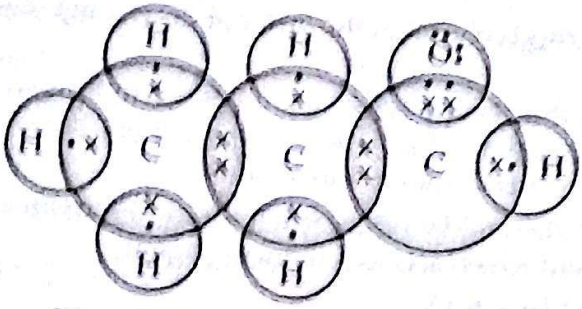


Electron dot structure of propanone

$CH_3-C(=O)-CH_3$

Propanone

1½ + 1

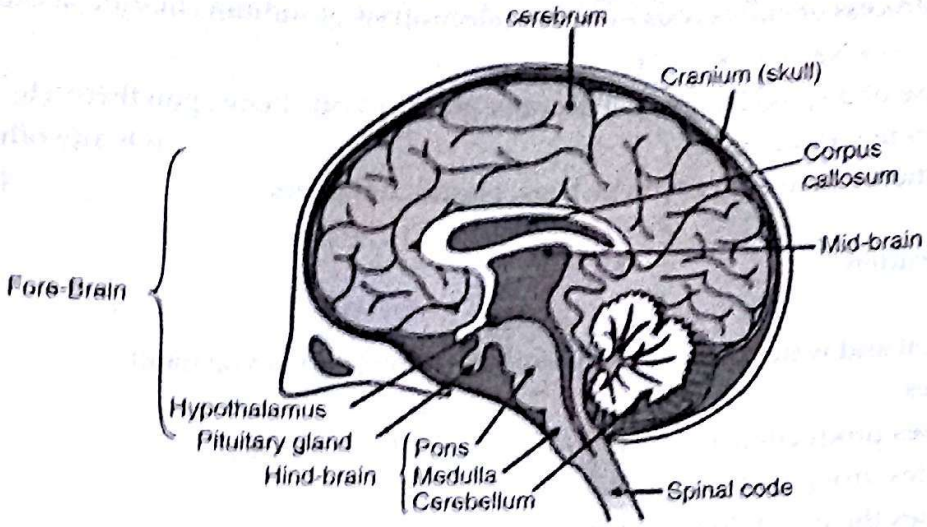


$CH_3 - CH_2 - CHO$

Propanal 1½ + 1

Electron dot structure of propanal

18. (a) (i)



2

(ii) Correct labelling 1

(iii) Medulla controls blood pressure, salivation and vomiting.

Cerebellum controls precision of voluntary movements and equilibrium. ½ + ½

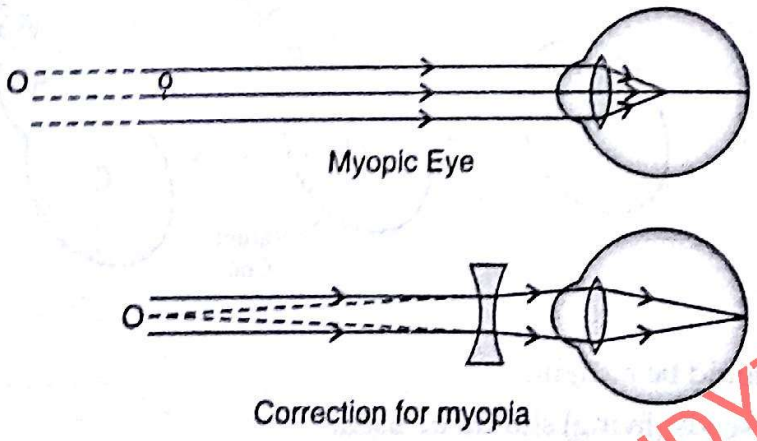
(Any one function each of Medulla and Cerebellum)

(b) Over production of growth hormone leads to gigantism and it's underproduction leads to dwarfism. 1

19. (a) Myopia 1

(b) $f = \frac{-1}{45} = -0.22$ cm ½ + ½

(c) Concave lens



1 + 1

(d) Causes :

(i) Due to excess curvature of eye lens

(ii) Elongation of the eye ball. ½ + ½

20. (a) The arrangement of metals in the vertical column in the order of decreasing reactivity is called reactivity series or activity series.

A metal placed above hydrogen in the activity series will displace hydrogen from water or acids. A metal placed at the top of the activity series would displace metal below it. Thus a more reactive metal displaces a less reactive metal from its salt solution. 5

(b) (i) For obtaining metals that are in the middle of the reactivity series, oxides of such metals can be reduced with coke (carbon) which acts as a reducing agent. 2

Example : $2\ Fe_2O_3 + 3\ C \longrightarrow 4\ Fe + 3CO_2$ 1½

(ii) For obtaining metals that are high in the reactivity series, their oxides are reduced to metals by the process of electrolysis example : electrolysis of sodium chloride at cathode :

$Na^+ + e^- \longrightarrow Na$ at anode : $2\ Cl^- \longrightarrow Cl_2 + 2e^-$ 1½

21. (a) (i) More use of dispossible items like paper plates, plastic items, polythene etc. 1 × 2

(ii) Changes in packaging (Or any other example) 1

Suggestion – Reuse of polythene bags, plastic containers. (Or any other)

(b) Hawk 1

Biomagnification 1

OR

(a) Scientific soil and water conservation is called watershed management.

Advantages : 1

(i) Increases production and income of watershed community.

(ii) Mitigates droughts and floods.

(iii) Increases the life of downstream dams reservoirs (Any two) 2

(b) (i) Maximum level of bio magnification occurs here because of progressive accumulation.

(ii) We get very small amount of energy as only 10 % of the previous energy gets transferred at each trophic level. 2

Section 'B'

22. (i) Acetic acid will remain colourless in phenolphthalein. ½

(ii) Acetic acid will dissolve in distilled water forming a clear solution. ½

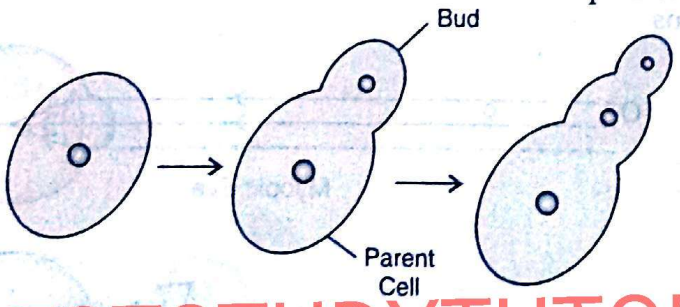
(iii) Universal indicator gives orange colour with acetic acid. ½

(iv) Sodium hydrogen carbonate will give brisk effervescence due to the formation of CO_2 gas. ½

23. Set I will have more length of foam because it consist of soft water.

Set II will form less foam because it consist of hard water due to the presence of $CaSO_4$. 1 + 1

24.



Budding ½ + ½ + ½ + ½

25. (i) The set up should be airtight.

(ii) Germinating seeds (living) should be used. 1 × 2

26. Graph

$v = 4v\ (9v - 5v)$ 1

$i = 1.25\ A\ (2.65\ A - 1.40\ A)$ 1

$R = \frac{v}{i} = \frac{4}{1.25} = 3.2\ \Omega$

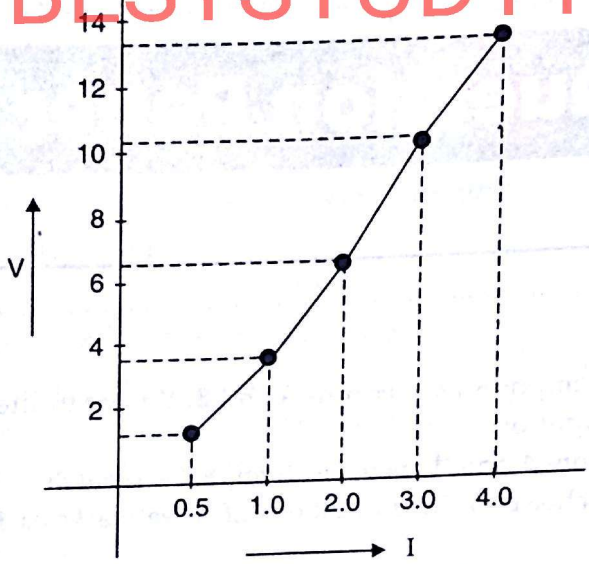
OR

An ammeter has 10 divisions between 0 to 0.5 A. So,

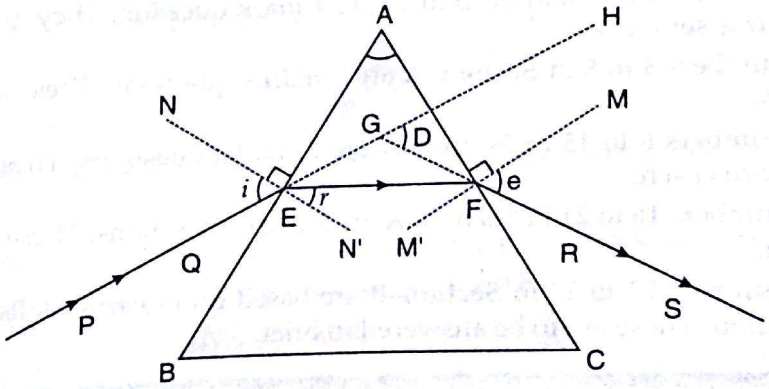
$$1 \text{ division} = \frac{0.5A}{10}$$

$$17 \text{ divisions} = \frac{17}{20} = 0.85A$$

Detailed Answer :



27.



PE – Incident ray
EF – Refracted ray
FS – Emergent ray
$\angle A$ – Angle of the prism
$\angle i$ – Angle of incidence
$\angle r$ – Angle of refraction
$\angle e$ – Angle of emergence
$\angle D$ – Angle of deviation