

SAMPLE PAPER-7

1. (c) By tissue culture technique, both plant and animal tissues are cultured. (1 mark)
2. (b) Lymph nodes invade the foreign particles and destroy them. It filters lymph and assists the immune system in building an immune response. Lymph nodes are major sites of B and T lymphocytes. (1 mark)
3. (b) The substance which gives **oxygen** is called oxidising agent. The substance which removes **oxygen** is called reducing agent. (1 mark)
4. (b) Petrol is used in vehicles not for cooking. (1 mark)
5. (d) Using lens formula $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$
 Here, $u = -f/2$ and f is +ve
 $\therefore \frac{1}{v} = \frac{1}{f} + \frac{1}{u} = \frac{1}{f} - \frac{2}{f} \therefore v = -f$ (Distance of image) (1 mark)
6. (d) Forests control pollution, prevent soil erosion and maintain ecological balance. (1 mark)
7. (a) $Mg + 2H_2O \rightarrow Mg(OH)_2 + H_2$ (1 mark)
8. (b) Rusting of iron is an oxidation reaction. (1 mark)
9. (d) (1 mark)
10. (c) A convex lens gives a magnified image of an object when it is placed between the radius or curvature and optical centre. Also, magnification is more for convex lens having shorter focal length. Therefore, for reading small letters, a convex lens of focal length of 5 cm is used for reading small letters in dictionary. (1 mark)
11. (a) B, Lower the value of pH, more acidic is solution
 (b) E, The pH of an alkaline solution lies in the range of 7 to 14. (1 mark)
12. (a) Zinc + Sulphuric acid \longrightarrow Zinc sulphate + Hydrogen
 $Zn(s) + H_2SO_4(aq) \longrightarrow ZnSO_4(aq) + H_2(g)$
 (b) Magnesium + Hydrochloric acid \longrightarrow Magnesium chloride + Hydrogen
 $Mg(s) + 2HCl(aq) \longrightarrow MgCl_2(aq) + H_2(g)$ (1 mark)
13. Binary fission differs from Multiple fission as:

	Binary Fission	Multiple Fission
1.	The nucleus divides into two daughter nuclei in the parent body.	The nucleus of the parent cell divides several times daughter cells are separated from each other.
2.	The whole parent body divides into two daughter cells.	Many daughter cells are arranged at the periphery of the parent cell.

(1 mark)

OR

Iodine is necessary for making of thyroxine hormone by thyroid gland, therefore, a deficiency of iodine in the diet can cause a deficiency of thyroxine hormone in body. People are advised to use iodised salt for cooking food so as to prevent from Goitre disease. (1 mark)

14. The embryo gets nourishment from the mother's blood with the help of a special tissue called placenta inside the mother's body. (1 mark)

OR

Budding is a type of asexual reproduction in which a new organism develops from an outgrowth or bud due to cell division at one particular site e.g. *Hydra*. (1 mark)

15. In case of diabetic patients, the cells of pancreas do not produce insulin when sugar level in blood is high. In such case, they are given insulin injections to decrease the sugar level in the blood. (1 mark)

16. Given $I = 0.5 \text{ A}$; $t = 10 \text{ min} = 600 \text{ S}$

Since, $Q = It$

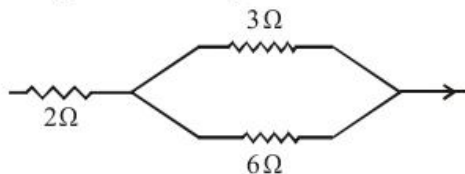
$$= 0.5 \text{ A} \times 600 \text{ S}$$

$$= 300 \text{ C}$$

(1 mark)

OR

3Ω and 6Ω are connected in parallel and this combination is connected in series with 2Ω resistor to get an equivalent resistance of 4Ω as given in the figure:



$$\frac{1}{R_1} = \frac{1}{3} + \frac{1}{6} \Rightarrow R_1 = 2 \Omega$$

$$R_{eq} = R_1 + 2 = 4 \Omega$$

(1 mark)

17. Radius of curvature, $R = + 32 \text{ cm}$

Since $R = 2f$

$$\text{So, } f = R/2 = + 16 \text{ cm}$$

(1 mark)

18. (a) The optical instruments are used to magnify the image. (1 mark)

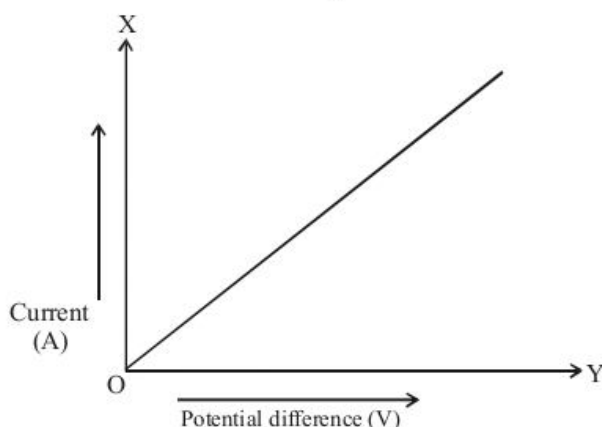
19. (d) A reducing agent is a substance which oxidises itself but reduces others *i.e.*, loses electrons. (1 mark)

(1 mark)

20. (d) Runners are special narrow, green and above ground horizontal branches which develop at the bases of erect shoots. (1 mark)

(1 mark)

21. The graph between current and potential difference is a straight line. It indicates that current is directly proportional to the potential difference and ratio $\frac{V}{I}$ is constant.



(3 marks)

22. Petroleum was formed by slow decomposition of sea plants and animals. These plants and animals were buried under the Earth's crust millions of years ago. They got covered by layers of sedimentary rocks which cut off the supply of air. In the absence of air, these fossils undergo a slow chemical change due to high temperature and pressure and then turned into new form, known as petroleum. It is also known as crude oil. (3 marks)

23. (a) Acetic acid. The growth of microorganisms responsible for food spoilage is prevented or they are rendered inactive by pickling in vinegar.
 (b) The elements which belong to same column or a group will have same number of electrons in their outermost shell, these electrons are also known as valence electrons. So all the elements in the same column as boron have the same number of valence electrons. Hence, they all have valency equal to 3. (1½ × 2 = 3 marks)
24. (a) They have same number of valence electron (*i.e.*, 1). Hence they are present in 1st group.
 (b) Lithium is least reactive because due to small size it cannot easily lose its electron *i.e.*, electron is tightly held by the nucleus as compared to Na & K.
 (c) Atomic size generally increases from top to bottom in a group, due to the addition of new shell, hence potassium will have largest atomic radius. (1 × 3 = 3 marks)

OR

Given mass number = 23

No. of neutrons = 12

∴ Atomic no. = 23 – 12 = 11

The electronic configuration of this element = 2, 8, 1

As it has only one electron in its valence shell thus this will belong to group 1. (3 marks)

25. Dialysis works on the principle of diffusion of solutes and ultrafiltration of fluids across a semi-permeable membrane. An artificial kidney is a device to remove nitrogenous waste products from the blood through dialysis. These kidneys contain number of tubes with semi-permeable lining, suspended in a tank filled with dialysing fluid, which has same osmotic pressure as blood, except that it is devoid of nitrogenous waste. The patients blood is passed through these tubes and purified blood is pumped back into the patient. (3 marks)
26. Human beings have 23-pairs of chromosomes, one pair is called as sex- chromosomes which decides the sex. The rest of the chromosomes are called as autosomes. Sex determination is a process by which the sex of an offspring is decided. (3 marks)

OR

Analogous organs are those organs which have different basic structure and developmental origin but have similar appearance and perform similar functions.

e.g. The wings of an insect and a bird have different structures or designs but they perform same basic function of flying. (3 marks)

27. Here, $f = 15\text{cm}$, $u = -10\text{cm}$, $v = ?$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{15} = \frac{1}{v} - \frac{1}{-10} \Rightarrow \frac{1}{v} = \frac{1}{15} - \frac{1}{10} = \frac{2-3}{30} = \frac{-1}{30}$$

$v = -30\text{ cm}$. Since v is -ve so it is a virtual image and at a distance of 30cm in the same side of the object.

$$\text{Magnification, } m = \frac{v}{u} = \frac{-30}{-10} = 3$$

Since m is greater than 1, therefore image is magnified (3 marks)

OR

Here, $f = 10\text{ cm}$, $u = -15\text{ cm}$, $h_0 = 2\text{cm}$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{10} = \frac{1}{v} - \frac{1}{-15}$$

$$\Rightarrow \frac{1}{v} = \frac{1}{10} - \frac{1}{15} = \frac{3-2}{30} = \frac{1}{30}$$

or, $v = 30\text{ cm}$

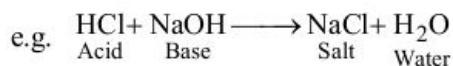
It is real and inverted image and right side of convex lens

$$\text{Magnification, } m = \frac{h_1}{h_0} = \frac{v}{u} \Rightarrow \frac{h_1}{2} = \frac{30}{-15} \Rightarrow \frac{h_1}{2} = -2 \Rightarrow h_1 = -4 \text{ cm}$$

It means height of image is 4cm

$$\text{Now, magnification (m)} = \frac{h_2}{h_1} = \frac{-4}{2} = -2 \quad (3 \text{ marks})$$

28. When an acid reacts with a base, then a salt and water are formed. *i.e.*

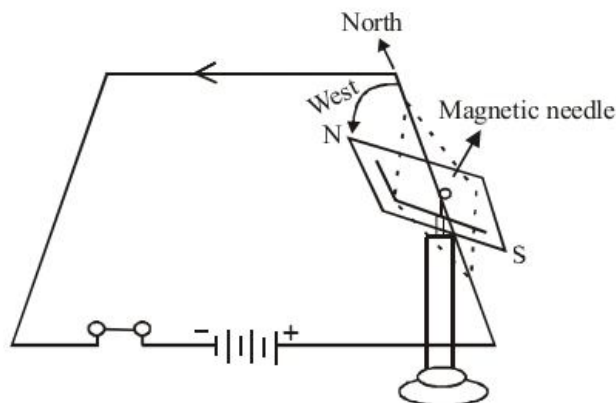


So we got positive ions Na^+ from base and negative ion Cl^- from the acid. (3 marks)

29. Vestigial organs are those organs which are functionless and rudimentary now but were functional in the ancestors. Example- The vermiform appendix of the large intestine and the nictitating membrane of the eye in human beings are vestigial organs because they do not have any function in the body now. (3 marks)

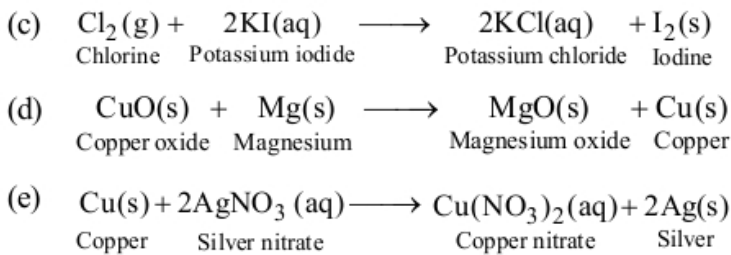
30. Menstruation, or period, is normal vaginal bleeding that occurs as part of a woman's monthly cycle. Every month, one egg is released by an ovary and if the egg is not fertilised, it lives for about one day. Since the ovary releases one egg every month, the uterus also prepares itself every month to receive a fertilised egg. Thus its lining becomes thick and spongy. The main purpose of this lining is to provide nourishment to the embryo. Now, however, this lining is not needed any longer. So, the lining slowly breaks and comes out through the vagina as blood and mucus which causes menstruation. (3 marks)

31. Take an electric circuit as shown in the figure. It consists of a battery, a key and connecting wires (conductor). Place this arrangement parallel to a magnetic needle. When the current is not flowing through this circuit, needle shows north-south direction but when current is flowing through the circuit, needle shows a deflection which indicates that there is a magnetic field, produced by electric current. (3 marks)



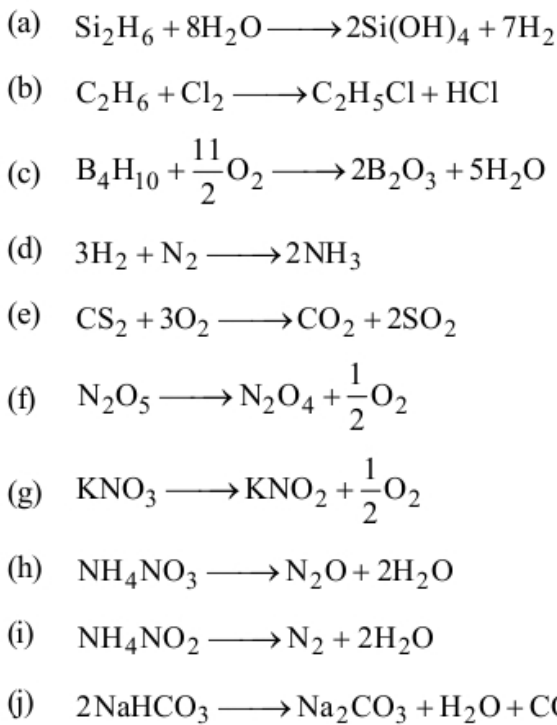
Moreover when the direction of current is reversed needle gets deflected in the opposite direction. This experiment shows that a conductor carrying current can produce magnetic field around it. (5 marks)

32. (a)
$$\begin{array}{ccccccc} \text{Fe}_2\text{O}_3(\text{s}) + 2\text{Al}(\text{s}) & \longrightarrow & \text{Al}_2\text{O}_3(\text{s}) + 2\text{Fe}(\text{s}) \\ \text{Iron(III)oxide} & \text{Aluminium} & \text{Aluminium} & \text{Iron} \\ & & \text{oxide} & \end{array}$$
- (b)
$$\begin{array}{ccccccc} \text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) & \longrightarrow & \text{AgCl}(\text{s}) + \text{NaNO}_3(\text{aq}) \\ \text{Silvernitrate} & \text{Sodium chloride} & \text{Silver chloride} & \text{Sodium nitrate} \end{array}$$



(1 × 5 = 5 marks)

OR



(½ × 10 = 5 marks)

33. (a) The nervous tissue of humans is made up of nerve cells or neurons. The neuron is the structural and functional unit of the nervous system. It is the largest cell in the body. A neuron is made up of three parts a cell body, dendrites and axon. The cell body contains granular cytoplasm and a central nucleus.

Axon is a simple, elongated fibre. Dendrites and axon arise from the cell body. The functional junction between nerves is called as synapse.

- (b) The roof of the hind brain forms a thickening which is called as cerebellum. This region controls and coordinates the balancing of organs and the muscles. It helps in coordination, adjustment of movement and posture.
- (c) The floor of hind brain thickens to form medulla oblongata and it continues into spinal cord. It is a site of involuntary activities which controls heart beat, blood vessels, breathing movements, coughing, sneezing and vomiting. (5 marks)

34. (a) When eye lens is focused at far point then object is at infinity, image is formed at focus.

(i) $u = \infty, v = 2.5 \text{ cm}$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{f} = \frac{1}{2.5} - \frac{1}{\infty}$$

$$\Rightarrow f = 2.5 \text{ cm} = 2.5 \times 10^{-2} \text{ m}$$

$$\therefore \text{Power of eye-lens } P = \frac{1}{f} = \frac{1}{2.5 \times 10^{-2}} = 40\text{D}$$

(ii) When eye lens is focussed at near point.

$$u = 25 \text{ cm, } v = 2.5 \text{ cm}$$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} = \frac{1}{2.5} - \frac{1}{25} = \frac{9}{25}$$

$$\therefore f = \frac{25}{9} \text{ cm} = \frac{25}{9} \times 10^{-2} \text{ m}$$

$$\therefore \text{Power of eye-lens, } P = \frac{1}{f} = \frac{1}{\frac{25}{9} \times 10^{-2}} = \frac{900}{25} = 36 \text{ D} \quad (2\frac{1}{2} \text{ marks})$$

(b) For object at infinity, $u = \infty$

Far point distance of the defected eye,

$$v = -150 \text{ cm}$$

By lens formula,

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} = \frac{1}{-150} - \frac{1}{\infty}$$

$$= -\frac{1}{150} + 0 = -\frac{1}{150}$$

or $f = -150 \text{ cm}$.

Power of lens required,

$$P = \frac{1}{f(\text{in m})} = \frac{1}{-1.50 \text{ m}} = -0.67 \text{ D}$$

Negative sign shows that the remedial lens is a concave lens.

(2½ marks)

35. An alloy is a homogeneous mixture of two or more metals or a metal and a non-metal.

(a) Brass is an alloy of Cu and Zn.

(b) Bronze is an alloy of Cu and Sn.

(c) Solder is an alloy of Pb and Sn.

Brass is used for making cooking utensils, screw, nuts, bolts wires etc.

Bronze is used for making cooling pipes, utensils, statues.

Solder is used for welding electric wires.

(5 marks)

36. **Cause of Concern :** Ozone layer present in the stratosphere has thinned out by about 8% over the equator and more so over the Antarctica where a big ozone hole appears every year. This has increased the level of UV-B radiations reaching the earth by 15-20%. These radiations are causing increased number of skin cancers, cataracts and reduced immunity in human beings. There is increased incidence of blinding of animals, death of young ones, reduced photosynthesis, higher number of mutations and damage to organisms.

Steps to limit damage :

(a) Ban on production and use of halons.

(b) Ban on production and use of chlorofluorocarbons.

(5 marks)

OR

Some examples of actions that are good for the global environment: reducing the quantity of nonfood items purchased, reuse of items until they are no longer usable, buying used items rather than getting everything new. Recycling paper, plastic, glass, and metal use of reusable cloth bags when shopping. Planting trees and other native plants, especially those that help feed the native wildlife. Reducing water use by not leaving water running when brushing teeth, by adjusting the water level of washing machines to match the size of the load, and by using water-saving fixtures. Reducing fossil fuel use by choosing a gas-efficient car and by using household heating and air conditioning only as needed. Use of compact fluorescent light bulbs, and turning-off lights that are not in use. Supporting organic farmers by purchasing organically grown food. Some examples of actions that are harmful for the global environment: Use of non-recyclable products and products that are not from recycled sources. Driving alone rather than carpooling or taking public transportation. Use of a gas or electric-powered lawn mower. Excessive purchases of non-essential items (gadgets, many sets of clothes, extra cars, vacation homes, etc.). Driving a low-mileage vehicle, such as a sport utility vehicle or truck, out of choice, not necessity. (5 marks)