

Solution of Question Paper

3

Section 'A'

1. Due to the presence of 2-electrons in the valence shell and similar chemical properties. 1
2. Plasmodium reproduces by a process known as multiple fission. Multiple fission is a type of asexual reproduction. [CBSE Marking Scheme, 2017] 1
3. Four properties of image formed by the given convex mirror are :
 - (i) Image is always erect.
 - (ii) Small in size.
 - (iii) Virtual
 - (iv) Always form behind the mirror between focus and pole. $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$
4. Management of forest and wildlife resources are considered as a challenging task because :
 - (i) There are many stakeholders of forest. Management of forest and wildlife has to take into account the interests of all these stakeholders which become a challenging task.
 - (ii) Industries would consider the forest as merely a source of raw material for its factories and huge interest groups lobby the government for access to these raw materials at artificially low rates which further poses a challenge to manage the forest and wildlife resources. 2
5. Auxin is the hormone which is usually synthesised in the young tip of roots and shoots. When light is coming from one side of the plant, it diffuses towards the shady side of the shoot which stimulates the cells to grow longer, resulting in the bending of shoot towards light, thus auxin promotes phototropism. 2
6. (i) Oxidising agent is a substance which can give oxygen to other substances.
 - (ii)
$$\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH} \xrightarrow[\text{OR acidified K}_2\text{Cr}_2\text{O}_7]{\text{alkaline KMnO}_4} \text{CH}_3 - \text{CH}_2 - \overset{\text{O}}{\parallel} \text{C} - \text{OH}$$

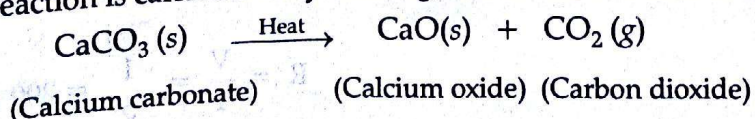
Propanol Propanoic acid
 - (iii) Propanol is oxidised to propanoic acid. 1 + 1 + 1

OR

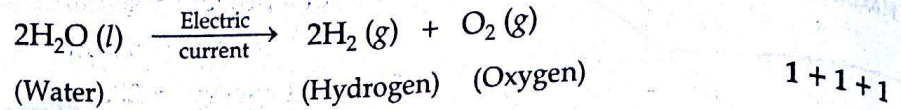
The oxidation of oils or fats in a food resulting into bad smell and bad taste is called rancidity.

It can be prevented by :

- (i) Adding anti-oxidants. 1 + 1 + 1
 - (ii) Flushing with nitrogen gas.
7. In a decomposition reaction, a single reactant breaks down into two or more simpler products. When a decomposition reaction is carried out by heating, it is called thermal decomposition reaction.



When decomposition reaction is carried out with the help of electric current, the process is called electrolysis.



8. Three methods of contraception :

- (i) Barrier method or mechanical method/ Condom/ Diaphragm, to prevent the meeting of sperms and ova.
 - (ii) Chemical method/ Oral pills— Changes the hormonal balance of the female partners so that the eggs are not released.
 - (iii) Surgical method— to block the vas deferens in males/ vasectomy or the fallopian tube (oviduct) in females/ tubectomy, to prevent the transfer of sperms or egg and hence no fertilization takes place.
 - (iv) IUCDs/ Loop or the copper- T placed in the uterus, to prevent pregnancy. (Any three)
- 1 + 1 + 1

9. In case of a spinal cord injury, signals for reflex action and involuntary action will get disrupted. Reflex actions are monitored and controlled through the spinal cord of nervous system and not by the brain. Infact, nerves from all over the body meet in a bundle in the spinal cord on their way to the brain. In case of any injury, to the spinal cord, the signals coming from the nerves as well as signal coming to the receptors will be disrupted. 3

10. A physical process by which oxygen is taken in and carbon dioxide in given out is called breathing.

Breathing in humans involves three steps :

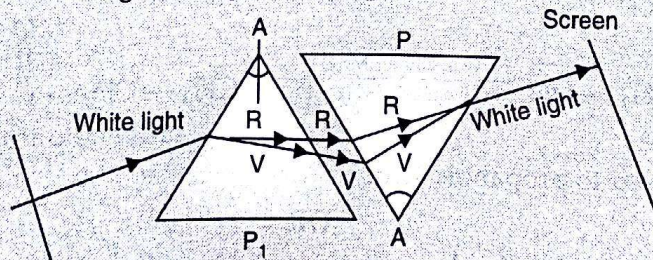
- (i) **Inspiration** : When we breathe in, ribs move up and flatten the diaphragm due to which the chest cavity becomes larger. As a result air is sucked into the lungs and fills the expanded alveoli.
- (ii) **Gaseous exchange** : Haemoglobin binds with the oxygen and carries it along the blood in the body. As blood passes through the tissues of the body, oxygen from the blood diffuses into the cell, whereas carbon dioxide which is produced during respiration diffuses into the blood and is carried to the lungs for expiration.
- (iii) **Expiration** : Ribs move down and diaphragm becomes dome-shaped decreasing the chest cavity. Thus, pushing the air out from lungs. 3

OR

It is the mode of nutrition in which an organism cannot make its own food and depends on other organisms for food. All the animals including man, most bacteria and some fungi have heterotrophic mode of nutrition and these organisms are called heterotrophs.

Three types of heterotrophic nutrition: Holozoic, Saprophytic and Parasitic. 1½ + 1½

11. **Cause of dispersion of white light** : Different colours of light bend through different angles with respect to the incident ray as they pass through a prism. Violet light bends the most and red the least. Thus, the each colour emerges along different paths. 1



[CBSE Marking Scheme, 2016] 2

12. $V = 200 \text{ V}$, $P = 40 \text{ W}$,

$$P = VI$$

$$I = \frac{P}{V} = \frac{40}{200} = \frac{1}{5} \text{ A}$$

$$R = \frac{V}{I} = \frac{200}{\frac{1}{5}} = 200 \times 5$$

$$= 1000 \Omega$$

$$\text{Total power} = 40\text{W} \times 5 = 200\text{W}$$

$$\text{Time} = 5 \text{ hours}$$

$$\text{Electrical energy} = 200\text{W} \times 5 \text{ hours}$$

$$= 1000 \text{ Wh}$$

$$= 1 \text{ kWh}$$

$$\text{Cost of 1 kWh} = 5.10 \text{ Rs.}$$

13. (i) The space around the magnet or current carrying conductor within which its influence can be felt by the magnetic substance is called magnetic field.

Two parameters that are necessary to describe magnetic field are magnitude and direction.

- (ii) It would mean that at the point of intersection, compass needle would point to 2 directions which is impossible.

14. The Law of conservation of energy states that energy can neither be created nor be destroyed. But, it can only be converted from one form to another. Despite this fact, the world is facing energy crisis the reason behind it is that energy is converted into non-usable forms.

Fossil fuels like coal, petroleum etc. are the sources of energy which have accumulated in nature over a long time and cannot be replaced. We should worry about such sources because these sources of energy are getting depleted and sooner or late, will no longer be available to us.

OR

The advantages of harnessing wind energy are :

- (i) It is an environment-friendly and efficient sources of renewable energy.

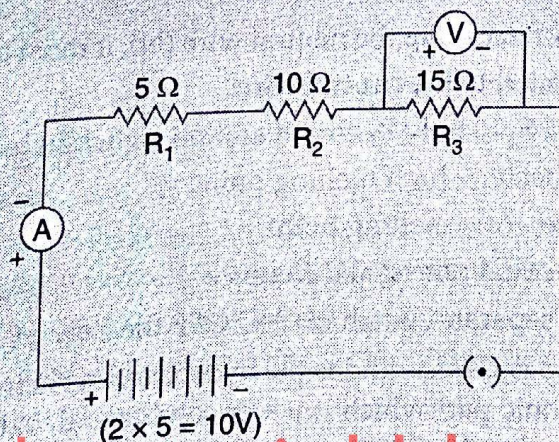
- (ii) It requires no recurring expenses for the production of electricity.

- (iii) It does not cause any pollution.

15. Biological magnification refers to the process of increase in the concentration of a toxic chemical with increasing trophic level in a food chain.

Harmful or poisonous substance such as DDT sprinkled to kill pests on plants enter the food chain. The plants absorb these harmful chemicals from soil along with water and minerals. They enter the food chain at producer level and then transfers to the next trophic level. The tertiary consumers get more higher levels of these chemicals.

16. (i)



beststudytutorial.blogspot.com $\frac{1}{2} + \frac{1}{2}$

10 V battery; Rest components

$$\text{Equivalent resistance} = R_1 + R_2 + R_3$$

$$= 5 + 10 + 15$$

$$= 30 \Omega$$

1

$\frac{1}{2}$

$\frac{1}{2}$

Current in the circuit,

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

$$I = \frac{10V}{30\Omega} = \frac{1}{3} \text{ A or } 0.33 \text{ A}$$

(ii) Potential difference across 5Ω resistor,

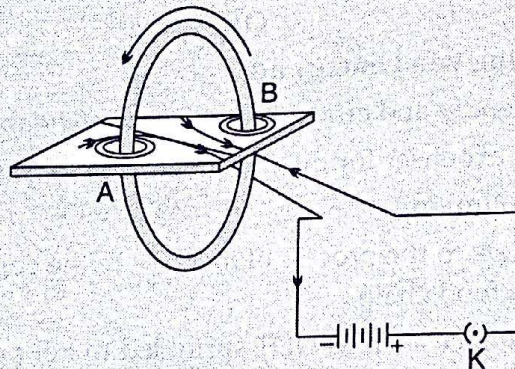
$$\begin{aligned} V &= IR \\ &= \frac{1}{3} \text{ A} \times 5 \Omega \\ &= 1.67 \text{ V} \end{aligned}$$

[CBSE Marking Scheme, 2012]

17. Representation of the magnetic field path along which an imaginary free north pole would tend to move. The tangent at any point on the magnetic field line gives the direction of the magnetic field at that point.

Three characteristics of magnetic line :

- (i) Emerge at north pole and merge at south pole. Inside the magnet, the direction of field lines is from south pole of magnet to its north pole and are closed curves.
- (ii) At the points where the magnetic field is stronger, field lines are crowded and vice-versa.
- (iii) No two magnetic field lines can intersect each other.



[CBSE Marking Scheme, 2016]

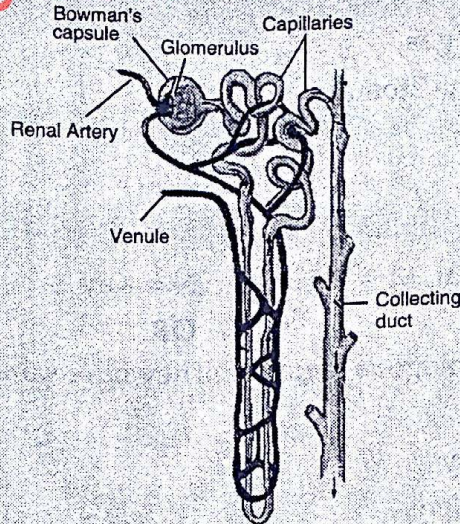
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OR

- (i) **Two errors are :**
 - (a) Fuse is incorrectly connected to the neutral wire (N), it must be connected to the live wire (L).
 - (b) Bulb B_2 is not connected to the neutral wire.
 - (c) Two switches S_1 and S_2 in bulb B_1 circuit and no switch in bulb B_2 circuit. (Any two) 2
- (ii)
 - (a) Element of electric heater—high melting point ½
 - (b) Element of fuse wire—low melting point ½
- (iii)
 - (a) Each appliance has equal potential difference. 1
 - (b) Each appliance has separate switch to ON/OFF the flow of current through it. 1
18. (i) Soap molecules have two ends—one end is the hydrocarbon chain which is water repellent, where as the other end is the ionic part which is water soluble. When soap is dissolved in water it forms a group of many molecules, known as micelle.
- (ii) These micelles are formed because their hydrocarbon chains come together and the polar ends are projected outwards.
- (iii) Micelle formation in ethanol will not occur because the hydrocarbon chain end of the soap will dissolve in ethanol.
- (iv) Soaps in the form of micelle are able to clean dirty clothes having oily spots, as the oily dirt is collected in the centre of the micelle, which forms an emulsion in water and on rinsing, the water washes away the micelles with dirt attached to them. 1 + 1 + 1 + 2

19. (i) Universal indicator is a mixture of many different indicators (or dyes) which give different colours at different pH values of the entire pH scale. The colour produced by universal indicator is used to find the pH value of acid or base by matching the colour with the colours on pH colour chart.
- (ii) Solution A is acidic and will turn litmus solution from blue to red. Solution B is basic and will turn phenolphthalein from colourless to pink.
- (iii) Green colour will be obtained. 2 + 2 + 1

20. (i) beststudytutorial.blogspot.com



Uriniferous tubule with its blood vessels

- (ii) Function of nephron is filtration, reabsorption and secretion. 3
- (iii) **Function of Artificial Kidney** : Helps to remove harmful wastes, extra salts and water, control blood pressure. Maintain the balance of sodium potassium salts in a patient whose kidney have failed. 1
- (Any one) 1

[CBSE Marking Scheme, 2014]

21. **Placenta** : A special tissue that helps human embryo in obtaining nutrition from mother's blood.
- Structure** : This is a disc which is embedded in the uterine wall which contains villi on the embryo side of the tissue, and on the mother's side are blood spaces which surround the villi.
- Function** : This provides a large surface area for glucose and oxygen to pass from the mother to the embryo, and the developing embryo will also generate waste substances which can be removed by transferring them into the Mother's blood through the placenta. 1 + 2 + 2

[CBSE Marking Scheme, 2016]

OR

- (a) **Unisexual flowers** : Cucumber, pumpkin, water melon, papaya, etc.

Bisexual flowers : Hibiscus, rose, lily, etc.

(Any one example)

- (b) **Changes in a flower after fertilisation** : The outer layers of the ovule become impervious and hard and function as a seed coat. An ovule with an embryo inside is called a seed.

The ovary enlarges and ripens to become a fruit. Other floral parts such as sepals, petals, stamens, styles and stigma may fall off. However, in some cases, they remain persistent in the fruit.

- (c) **Deoxyribonucleic acid (DNA) copying** is an essential part of reproduction, as it passes genetic information from parents to offspring. The reproducing cells produce a copy of their DNA through some chemical reactions and result in two copies of DNA. The copying of DNA always takes place along with the creation of additional cellular structure. This process is then followed by the division of a cell into two cells. In this way, the amount of DNA remains constant through each new generation. 1 + 2 + 2

Section 'B'

22. (i) Copper is displaced by iron.
(ii) It is a displacement reaction. 1 + 1
23. (i) No change/ remains colourless
(ii) No change
(iii) Turns pink/ orange
(iv) Evolution of colourless gas $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$
24. Elliptical shape pore is stoma/stomata.
Kidney shape is guard cells. 1 + 1
25. (i) Division of the nucleus
(ii) Division of cytoplasm 1 + 1
26. K = Voltmeter, L = Rheostat, M = Ammeter, N = Key $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$
- OR**
- Carrot and Radish are homologous structure. They have same origin and they both are edible roots. 2
27. (i) Towards the lens
(ii) Size decreases gradually
(iii) Nearly 30 cm from the lens
(iv) Intensity of the image gradually increases. $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$