**SET - B**

| 10th CBSE Batch : | **MAHESH TUTORIALS**<br>**SUBJECT : SCIENCE & TECHNOLOGY**<br>**Chapter : 1, 2, 3, 6, 7 [Upto Plants], 12, 13, 14 OR 10**<br>**Model Answer Paper** | **Test -**<br>Date:<br>Marks : 60<br>Time: 2 Hrs |
|---|---|---|

**Q : 1** **Answer the following questions : [1 Marks]** **05**

**1.** anode, cathode. 1

**2.** The organisms which can make their own food from $CO_2$ and $H_2O$ are called autotrophs. Eg. All green plants are autotrophs. 1

**3.** (b) Ohm 1

**4.** The degree of closeness of magnetic field lines gives the relative strength of the magnetic field. 1

**5.** Biogas is made up of methane, carbon dioxide, hydrogen and hydrogen sulphide. 1

**OR**

**5.** (a) Convex lens ½
(b) Concave lens ½

**Q : 2** **Answer the following questions : [2 Marks]** **12**

**6.**

| **Combination reaction** | **Decomposition reaction** |
|---|---|
| a. Combination reaction involves formation of a single substance from two or more elements or compounds. | a. Decomposition reaction involves breakdown of single substance into two or more simple substance. 1 |
| e.g. | e.g. |
| $2H_2(g) + O_2(g) \longrightarrow 2H_2O(l)$ | $CaCO_3(s) \xrightarrow{Heat} CaO(s) + CO_2(g)$ 1 |

**7.**

| **Aerobic Respiration** | **Anaerobic Respiration** |
|---|---|
| a) It takes place in the presence of oxygen. ½ | a) It takes place in the absence of oxygen. |
| b) Complete break down of glucose. ½ | b) Partial break down of glucose. |
| c) End products are $CO_2$ and $H_2O$ ½ | c) End products may be ethanol, $CO_2$ or lactic acid. |
| d) It produces large amount of energy ½ | d) It produces less amount of energy. |
| e) eg. man | e) eg. yeast, bacteria |

**8.** It is due to the turgor pressure difference between the upper and lower halves of the base of petiole (pulvinus). Cells from the lower half lose water and cells from the upper half of pulvinus become turgid due to transfer of water from lower cells. Thus, the entire leaf droops down when touched. 2

**9.**

| **Ammeter** | **Voltmeter** |
|---|---|
| 1. It is an instrument to measure the electric current flowing through the circuit. 1 | 1. It is an instrument to measure the potential difference between the two terminals of a cell. |
| 2. It is connected in series with the cell. ½ | 2. It is connected in parallel with the cell. |
| 3. It has a very low resistance. ½ | 3. It has a very high resistance. |

**10.** The power of an electric motor is enhanced by :

(i) using an electromagnet in place of permanent magnet. ½

(ii) having large number of turns of the conducting wire in the current - carrying coil. 1

(iii) using a soft iron core on which the coil is wound (soft iron core along with the coils is called an armature). ½

**11.** The advantages of hydroelectricity are :

(i) The generation of electricity from flowing water does not produce any pollution. ½

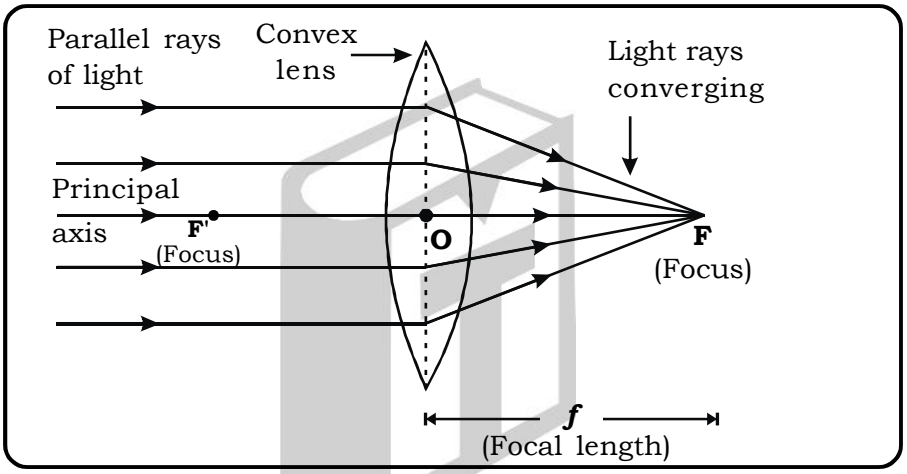
(ii) Flowing water is a renewable source of energy which will never get exhausted. ½

(iii) The construction of dams on rivers helps in controlling floods, and in irrigation. ½

(iv) The generation of electricity from flowing water conserves our fossil fuels. ½

**OR**

**11.** A convex lens is also known as a converging lens because it converges (brings to a point), a parallel beam of light rays passing through it. ½




1 ½

**Q : 3 Answer the following questions : [3 Marks]** **18**

**12.** a. Paint covers the surface of iron articles. Hence, moist air cannot come directly in contact with iron. As a result it cannot attack iron and prevents rusting. 1 ½

b. In the presence of oxygen of the air, the fats present in the fatty food are oxidised to compounds which have a bad smell i.e., the food becomes rancid. Flushing with nitrogen cuts off oxygen and prevent the food from rancidity 1 ½

**13.** i) Methly orange solution turns red. 1

ii) Phenolphthalein solution turns colourless 1

iii) Litmus solution :

Red litmus solution → Red ½

Blue litmus solution → Red ½

**14.** Aluminium is a strong and cheap metal. It is also conductor of heat. But it is highly reactive. When it is exposed to moist air, its surface is covered with a thin impervious (non-penetratable) layer of aluminium oxide ($Al_2O_3$). This layer does not allow moist air to come in contact with the fresh metal and hence protects the metal underneath from further damage or corrosion. Thus, after the formation of this protective layer of $Al_2O_3$, aluminium becomes resistant to corrosion. It is because of this reason that although aluminium is a highly reactive metal, it is still used to make untensils for cooking. 3

**15.** Transport system in human being consists of the heart, blood vessels, blood, lymphatic vessels and lymph. ½

Function of Heart.

Heart is a pumping organ that receives blood from the veins and pumps it to the arteries. ½

**Functions of blood vessels :**

1. **Arteries** - These carry oxygenated blood from the heart to different organs of the body. ½
2. **Veins** - These carry de - oxygenated blood from different organs to the heart. ½
3. **Capillaries** - These are narrow and thin-walled. These walls are permeable, so that water and dissolved substances pass in and out, exchanging $O_2$, $CO_2$, dissolved nutrients and excretory products with the tissues. 1

**16.**

| Tropic movements | Nastic Movements |
|---|---|
| a. It is always directional in relation to the direction of stimulus. | a. It is non-directional and is not related to the direction of stimulus. 1 |
| b. Mostly it occurs in cylindrical organs. e.g., shoot tip | b. Such a movement is generally found in the organs, e.g., leaves. 1 |
| c. It is a growth movement. e.g. phototropism. | c. It can be growth or turgor movement. Eg.Seismonasty. 1 |

**17.** **Given :** I = 0.56 A, t = 20 minutes = 20 × 60 = 1200 s

We know that $I = \frac{Q}{t}$ 1

y Q = It 1

= 0.56 × 1200

= 672 C 1

**Q : 4 Answer the following questions : [5 Marks]** **25**

**18.** i. Zinc granules + dilute sulphuric acid ⟶ Zinc sulphate + Hydrogen 1

$Zn + H_2SO_4(dil) \longrightarrow ZnSO_4 + H_2$ ½

ii. Magnesium ribbon + dilute hydrochloric acid ⟶ Magnesium chloride + Hydrogen ½

$Mg + 2\,HCl\,(dil) \longrightarrow MgCl_2 + H_2$ ½

iii. Aluminium powder + dilute sulphuric acid ⟶ Aluminium sulphate + Hydrogen ½

$2Al + 3H_2SO_4(dil) \longrightarrow Al_2(SO_4)_3 + 3H_2$ ½

iv. Iron filings + dilute sulphuric acid ⟶ Iron (II) sulphate + Hydrogen 1

$Fe + H_2SO_4(dil) \longrightarrow FeSO_4 + H_2$ ½

**19.** (i) Metals and non-metal atoms have incomplete octets. They combine with each other by losing, gaining or sharing electrons so as to complete their octets. ½

(ii) The atomic number of sodium is 11. Therefore its electronic configuration is

| K | L | M |
|---|---|---|
| 2 | 8 | 1 |

½

It has one electron in the outermost shell, i.e., M shell. thus, the electron dot structure of sodium is $\dot{N}a$

The atomic number of oxygen is 8. Therefore, its electronic configuration is. ½

| | | |
|---|---|---|
| | K L<br>2 6<br>It has six electrons in the outermost shell, i.e. L shell. Thus, the electron dot structure of oxygen is<br>The atomic number of magnesium is 12. Therefore, its electronic configuration is | ½ |
| | K L M<br>2 8 2 | ½ |
| | It has two electrons in the outermost shell, i.e., M shell. Thus, the electron dot structure of Mg is Mg: | |
| | (iii) **Formation of $Na_2O$.**<br>Sodium has one electron in the outermost shell while oxygen has six. To complete its octet, oxygen needs two more electrons. But to complete its octet, sodium loses one electron . In order to equalize the number of electrons lost and gained, two atoms of sodium combine with one atom of oxygen. The formation of $Na_2O$ is shown below | ½ |
| |  <br> | ½ |
| | **Formation of MgO.**<br>Mg has two electrons in the outermost shell and oxygen has six. To complete their octets, magnesium loses two electrons and oxygen accepts them. The formation of MgO is shown below : | ½ |
| |  <br> | ½ |
| | (iv) In $Na_2O$, ions present are sodium cation ($Na^+$) and oxide anion ($O^{2-}$)<br>In MgO, ions present are magnesium cation ($Mg^{2+}$) and oxide anion ($O^{2-}$) | ½ |
| **20.** | It is the movement of a part of the plant in response to a chemical stimulus. If the plant shows movement towards the chemical, it is called positive chemotropism and if the plant part shows movement away from the chemical is called negative chemotropism. | 3 |
| | For example : The growth of pollen tube towards a chemical which is produced by an ovule during the process of fertilisation in a flower. | 2 |
| **21.** | Precautions to be taken while using electricity are : | |
| | (i) Switch off all switches including main switch whenever there is a sparking or fire. | ½ |
| | (ii) All connections must be tight. Wires must be covered with proper insulation and of proper thickness. All joints must be covered with insulting tape. Defective switches should be immediately replaced. | ½ |
| | (iii) Fuses should be always connected to live wire. The earth wire must be connected to the body of electric appliance. | ½<br>½ |
| | (iv) Fuse must be of proper rating and should always be connected to live wire. | ½ |
| | (v) Whenever repairs are needed, switch off main switch. If however, repairs need a direct handling of live wire, use of rubber gloves or rubber shoes or a plier with insulated handle is a must. | ½ |
| | (vi) In spite of all the precautions, a person gets a shock due to accidental touching with a live wire, one should try to provide such a person with | ½<br>½ |

support of some non-conducting material like wood, plastic or rubber.

(vii) Never try to pull away person by your hand. ½

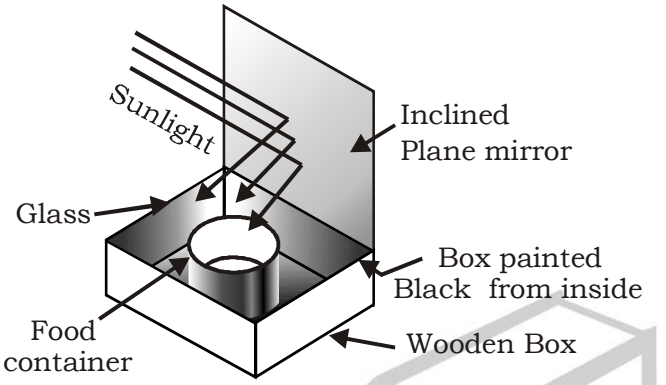
(viii) Always put dry rubber shoes while repairing the circuit. ½

**22.** ***Construction :***

(i) Solar cooker consists of an insulated wooden or metallic box. Inside walls of the box are black painted. ½

(ii) A plane mirror reflector is attached to the box and its position is adjustable. It is provided with containers whose outer sides are black painted. ½ ½

(iii) A metallic box is covered by a thick glass sheet.




**Box type Solar Cooker**

**(For reference only)**

1

***Working :***

(iv) The food to be cooked is taken in the container which is then placed inside the box. The container is covered with glass sheet. ½

(v) The plane mirror is adjusted in such a way that maximum sunlight falls on glass sheet. ½

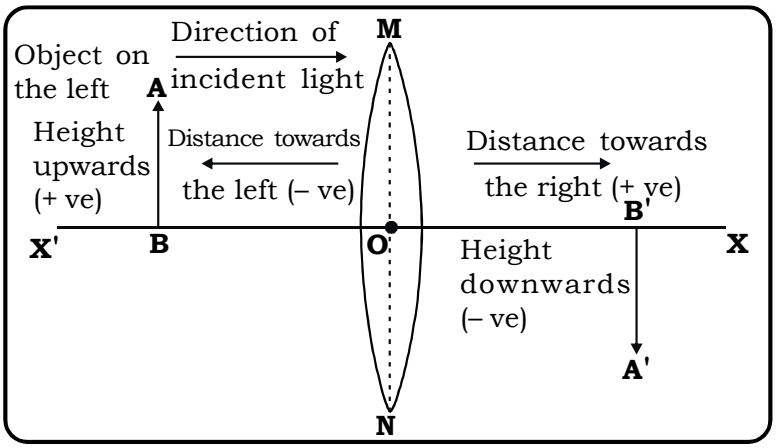
(vi) Sunlight passes through transparent glass sheet and is absorbed by black painted walls of container and its box. ½

(vii) The (infrared) radiations in the sunlight heat the box and the food. ½

(viii) Inside the box the temperature may go upto 100°C to 140°C within 2 to 3 hours and the food gets cooked. ½

**OR**

**22.** (i) The object is always placed to the left of the mirror. This implies that the light from the object falls on the mirror from the left-hand side.




1

1

1

(ii) All distances parallel to the principal axis are measured from the pole of the mirror.

(iii) All the distances measured to the right of the origin (along + x-axis) are taken as positive while those measured to the left of the origin (along – x-axis) are taken as negative. 1

(iv) Distances measured perpendicular to and above the principal axis (along + y-axis) are taken as positive.

(v) Distances measured perpendicular to and below the principal axis (along – y-axis) are taken as negative. 1

★★★★ ***Best of Luck*** ★★★★