

10 th CBSE Batch :	MAHESH TUTORIALS SUBJECT : SCIENCE & TECHNOLOGY Chapter : 1, 2, 3, 6, 7 [Upto Plants], 12, 13, 14 OR 10 Model Answer Paper	Test - Date: Marks : 60 Time: 2 Hrs
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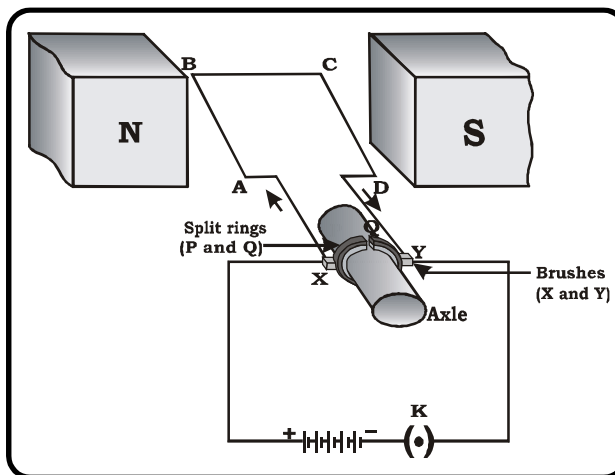
Q : 1	<p>Answer the following questions : [1 Marks]</p> <ol style="list-style-type: none"> Anti oxidants. 1 Carbohydrates, Fats, Proteins, Mineral salts are four important nutrients present in our diets. 1 (a) volt 1 (i) Inside a magnet the magnetic field lines direct from south pole towards north pole. ½ (ii) Outside a magnet the magnetic field lines direct from north pole to south pole. ½ The dead parts of plants and trees, and the waste material of animals are called biomass. For example, wood, crop residues and cow dung. 1 <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 1 dioptre is the power of a lens whose focal length is 1 metre. 1 	05								
Q : 2	<p>Answer the following questions : [2 Marks]</p> <ol style="list-style-type: none"> During digestion, food is broken down into simpler substances. Starch is broken down into a simple carbohydrate called glucose. This glucose then undergoes slow combustion by combining with oxygen in the cells of our body to produce energy in a process called respiration. This energy maintains our body heat. 1 $C_6H_{12}O_6(aq) + 6O_2(g) \longrightarrow 6H_2O(l) + 6CO_2(g) + \text{Energy}$ As the energy is evolved in the form of heat (at the product side), the reaction is exothermic. 1 <ol style="list-style-type: none"> C_2H_5OH and CO_2 = anaerobic respiration 1 CO_2 and H_2O = aerobic respiration ½ Lactic acid = anaerobic respiration ½ <ol style="list-style-type: none"> In plants, control and co-ordination is brought about by means of chemical substances called phytohormones. 1 In addition, environmental factors like water, temperature and light controls growth and development. 1 	12								
9.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Conductors</th> <th style="width: 50%; text-align: center;">Insulators</th> </tr> </thead> <tbody> <tr> <td>1. Substances which allow the charges to pass easily are called conductors. 1</td> <td>1. Substances which do not allow the charges to pass are called insulators. 1</td> </tr> <tr> <td>2. Conductors have large number of free electrons. ½</td> <td>2. Insulators have less or practically no free electrons. ½</td> </tr> <tr> <td>3. Conductors are mostly metals (exception graphite) E.g. Silver, copper, etc. ½</td> <td>3. Insulators are non-metals. E.g. Glass, wood, etc. ½</td> </tr> </tbody> </table>	Conductors	Insulators	1. Substances which allow the charges to pass easily are called conductors. 1	1. Substances which do not allow the charges to pass are called insulators. 1	2. Conductors have large number of free electrons. ½	2. Insulators have less or practically no free electrons. ½	3. Conductors are mostly metals (exception graphite) E.g. Silver, copper, etc. ½	3. Insulators are non-metals. E.g. Glass, wood, etc. ½	
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10.	If a soft iron rod called core is placed inside a current - carrying solenoid, then the strength of magnetic field becomes very large because the iron core gets magnetised by induction. This combination of a solenoid and a soft iron core is called an electromagnet. Thus, an electromagnet consists of a long coil of insulated copper wire wound on a soft iron core.	2
11.	(i) A biogas plant being quite simple, can be easily built in rural areas. (ii) Biogas is clean fuel that burns without smoke and leaves no ash. (iii) The spent slurry, being rich in nitrogen and phosphorus, which is good fertilizer. (iv) The main constituent of biogas is methane which has high calorific value than the petrol. (v) By using biogas, firewood is saved and deforestation is reduced.	½ ½ ½ ½
OR		
11.	When the tooth is within the focus of a concave mirror, then a virtual, erect and magnified image of the tooth can be seen in the mirror. Due to this, it becomes easier to detect the defect in the tooth. Hence, dentists use a concave mirror.	2
Q : 3	Answer the following questions : [3 Marks]	18
12.	When silver nitrate solution is added to sodium chloride solution then a white precipitate of silver chloride is formed along with sodium nitrate solution. a) $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \longrightarrow \text{AgCl}(\text{s}) \downarrow + \text{NaNO}_3(\text{aq})$ b) Double displacement reaction.	1 1 1
13.	Curd and other sour substances should not be kept in brass and copper vessels. This is because curd and other sour substances contain acids which can react with these vessels to form poisonous compounds that can cause food poisoning and damage our health.	3
14.	Some metal oxides, such as aluminium oxide, zinc oxide etc. show both acidic as well as basic behaviour. Such metal oxide which react with both acids as well as bases to produce salts and water are known as amphoteric oxides. Aluminium oxide reacts in the following manner with acids and bases. $\text{Al}_2\text{O}_3 + 6\text{HCl} \longrightarrow 2\text{AlCl}_3 + 3\text{H}_2\text{O}$ $\text{Al}_2\text{O}_3 + 2\text{NaOH} \longrightarrow 2\text{NaAlO}_2 + \text{H}_2\text{O}$	1 1 1
15.	a) The respiratory organs of fish are gills. The fish breathes by taking in water through its mouth and sending it over the gills. b) When water passes over the gills, the gills extract dissolved oxygen from the water. c) This O_2 is absorbed by the blood and carried to all the parts of the body. d) The CO_2 produced by respiration is brought back by the blood in to the gills for expelling into the surrounding water.	1 1 ½ ½
16.	There are five major types of plant hormones which are involved in the control and coordination in plants. 1) Auxin : a) It promotes cell elongation, root formation, cell division, respiration etc. 2) Gibberellins : a) It stimulate stem elongation, flowering etc. b) It helps in seed germination.	½ ½

	<p>3) Cytokinins : a) It promotes cell division and also helps in breaking the dormancy of seeds. b) It delay the ageing in leaves.</p> <p>4) Absciscic acid : a) It inhibits growth b) It cause wilting of leaves.</p>	<p>½ ½ ½</p>
<p>17.</p>	<p>Given : $Q = 3 \text{ C}, V = 12 \text{ V}$ To find : W</p> $V = \frac{W}{Q}$ <p>m $W = VQ$ $= 12 \times 3 = 36 \text{ J}$</p>	<p>1 1 1</p>
<p>Q : 4</p>	<p>Answer the following questions : [5 Marks]</p>	<p>25</p>
<p>18.</p>	<p>i. Zinc granules + dilute sulphuric acid \longrightarrow Zinc sulphate + Hydrogen $\text{Zn} + \text{H}_2\text{SO}_4(\text{dil}) \longrightarrow \text{ZnSO}_4 + \text{H}_2$</p> <p>ii. Magnesium ribbon + dilute hydrochloric acid \longrightarrow Magnesium chloride + Hydrogen $\text{Mg} + 2 \text{HCl}(\text{dil}) \longrightarrow \text{MgCl}_2 + \text{H}_2$</p> <p>iii. Aluminium powder + dilute sulphuric acid \longrightarrow Aluminium sulphate + Hydrogen $2\text{Al} + 3\text{H}_2\text{SO}_4(\text{dil}) \longrightarrow \text{Al}_2(\text{SO}_4)_3 + 3\text{H}_2$</p> <p>iv. Iron filings + dilute sulphuric acid \longrightarrow Iron (II) sulphate + Hydrogen $\text{Fe} + \text{H}_2\text{SO}_4(\text{dil}) \longrightarrow \text{FeSO}_4 + \text{H}_2$</p>	<p>1 ½ 1 ½ ½ ½ ½</p>
<p>19.</p>	<p>(a) Ionic compounds consist of oppositely charged ions held together by strong electrostatic forces of attraction. Hence, they require a lot of heat to cut off these forces of attraction and break them into ions.</p> <p>(b) In an ionic solid, the ions are held together and are not free to move. Hence, they do not conduct electricity.</p> <p>(c) 'Like dissolves like,' Ionic compounds are polar in nature, do they get dissolved in polar solvent like water.</p> <p>(d) In solid state there are no free ions present for conduction of electricity.</p> <p>(e) NaCl is an ionic compound which gives Na^+ and Cl^- ions in aqueous solution. AgNO_3 is also an ionic compound which gives Ag^+ and NO_3^- ions in aqueous solution. The oppositely charges Ag^+ and Cl^- ions in the solution combine to form precipitate of AgCl. CCl_4 is a covalent compound. It does not give Cl^- ions and hence does not form a precipitate of AgCl.</p>	<p>1 1 1 1 1</p>
<p>20.</p>	<p>The growth movement of tendril in response of unilateral stimulus of touch is called thigmotropism. Tendrils of louki, tori, karela, and sweet pea plant coil around hared objects when they come in their contact. It occurs due to unequal growth of two sides of tendril. The growth of the surface which comes in contact of the support is retarded, while it remains normal or increased on the other side, due to which tendril coils around the support.</p>	<p>5</p>

21.

- (i) An electric motor is a rotating device that converts electrical energy to mechanical energy.
- (ii) An electric motor, consists of a rectangular coil ABCD of insulated copper wire.
- (iii) The coil is placed between the two poles of a magnetic field such that the arm AB and CD are perpendicular to the direction of the magnetic field.
- (iv) The ends of the coil are connected to the two halves P and Q of a split ring. The inner sides of these halves are insulated and attached to an axle.
- (v) The external conducting edges of P and Q touch two conducting stationary brushes X and Y, respectively.
- (vi) Current in the coil ABCD enters from the source battery through conducting brush X and flows back to the battery through brush Y.
- (vii) Notice that the current in arm AB of the coil flows from A to B. In arm CD it flows from C to D, that is, opposite to the direction of current through arm AB.
- (viii) On applying Fleming's left hand rule for the direction of force on a current carrying conductor in a magnetic field.
- (ix) We find that the force acting on arm AB pushes it downwards while the force acting on arm CD pushes it upwards.
- (x) Thus the coil and the axle O, mounted free to turn about an axis, rotate anticlockwise.
- (xi) At half rotation, Q makes contact with the brush X and P with brush Y. Therefore the current in the coil gets reversed and flows along the path DCBA.
- (xii) A device that reverses the direction of flow of current through a circuit is called a commutator.
- (xiii) In electric motors, the split ring acts as a commutator.
- (xiv) The reversal of current also reverses the direction of force acting on the two arms AB and CD. Thus the arm AB of the coil that was earlier pushed down is now pushed up and the arm CD previously pushed up is now pushed down.
- (xv) Therefore the coil and the axle rotate half a turn more in the same direction. The reversing of the current is repeated at each half rotation, giving rise to continuous rotation of the coil and to the axle.



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½

½

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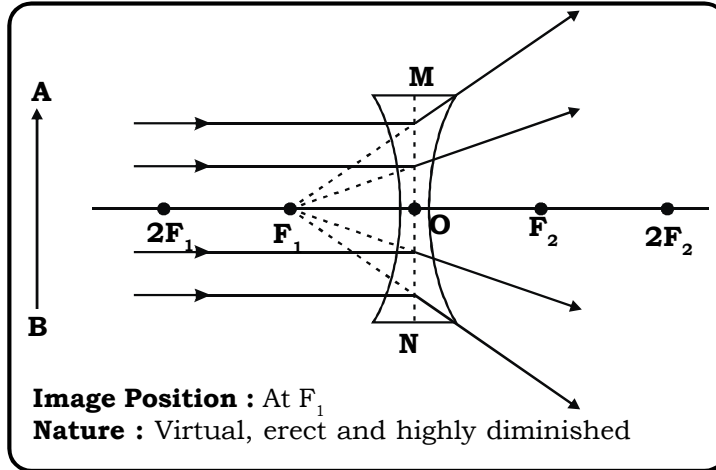
22.

	Nuclear fusion	Nuclear fission	
	1. In nuclear fusion, two lighter nuclei combine to form a heavy and stable nucleus.	1. In nuclear fission, a heavy nucleus splits to form two or more lighter nuclei.	1 ½
	2. This reaction takes place only at a very high temperature of the order of 10^9 °C.	2. This reaction can take place at a normal temperature.	1
	3. Energy released per nucleon in fusion reaction is much greater than energy released per nucleon in fission reaction.	3. Energy liberated during a single nuclear fission is very less.	1
	4. It is very difficult to achieve controlled nuclear fusion on the surface of the earth.	4. It is not very difficult to achieve controlled nuclear fission for an atomic reactor.	1 ½

OR

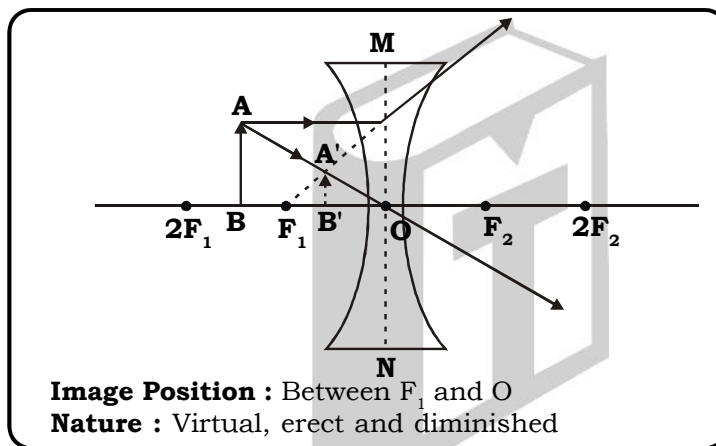
22.

(i) Object is at infinity for a concave lens.



2½

(ii) Object between $2F_1$ and F_1 of a concave lens.



2½

★★★★ Best of Luck ★★★★★