SET - C

A.P. SET CODE
C

MT - y

2017 ___ __ 1100 - MT - y - SCIENCE & TECHNOLOGY (72) - II - SET - C (E)

Time : 2 Hours **Preliminary Model Answer Paper** **Max. Marks : 40**

A.1.	**(A) Answer the following sub-questions :**	
(1)	**Fill in the blanks and rewrite the complete statements :**	
	(i) The process in which carbonate ores are changed into oxides by heating strongly in limited air is known is **calcination**.	**1**
	(ii) **Methyl Alcohol OR Methanol** is the first homologue of alcohol series.	**1**
(2)	**Name the following :** Tropism or tropic movement	**1**
(3)	**Match the columns:** **Column 'A'** **Column 'B'** (i) Inhibits plant growth - Abscisic acid (ii) Cytokinins - Promote cell division (iii) Cellular respiration - Mitochondria (iv) Bile - Breaks large fat globules into smaller ones	**2**
A.1.	**(B) Rewrite the following statements by selecting the correct options :**	
(1)	(b) Oxygen	**1**
(2)	Ramesh observed a slide of Amoeba with elongated nuclei. It would represent Binary fission.	**1**
(3)	A solution of $Al_2(SO_4)_3$ in water is **colourless**.	**1**
(4)	(c) Cu < Fe < Zn < Al	**1**
(5)	Ethanoic acid **has a vinegar like odour**.	**1**

A.2. Answer the following subquestions : (any five)

(1) (i) Calcium reacts with cold water to form calcium hydroxide and hydrogen gas. **2**

$$\underset{\text{Calcium}}{Ca_{(s)}} + \underset{\text{Water}}{2H_2O_{(l)}} \rightarrow \underset{\substack{\text{Calcium}\\\text{hydroxide}}}{Ca(OH)_{2(aq)}} + \underset{\substack{\text{Hydrogen}\\\text{gas}}}{H_{2(g)}\uparrow}$$

(ii) The heat produced is less which is not sufficient to burn the hydrogen gas. The piece of calcium metal starts floating in water as bubbles of hydrogen gas formed during the reaction stick to its surface. This reaction is less violent.

(2) **2**

Alkane	Alkene
(i) Alkanes are the hydrocarbons in which the carbon atoms are linked to each other only by single bonds.	(i) Alkenes are the hydrocarbons in which carbon atoms are linked to each other by double bonds.
(ii) The general formula of an alkane is C_nH_{2n+2}	(ii) The general formula of an alkene is C_nH_{2n}
(iii) They are chemically less reactive.	(iii) They are chemically more reactive.

(3) **2**

(i) Plants do not have definite excretory system or organ for removal of wastes.
(ii) Gaseous excretory materials are eliminated by diffusion.
(iii) Many plant waste products are stored in the vacuoles of the leaves, flowers, fruits and even in the bark that falls off. Other waste products are stored as resins and gums in old xylem.
(iv) Plants also excrete some waste substances in the soil around them.
(v) In some plants, waste is in the form of calcium oxalate crystals called as raphides. These are needle shaped and therefore hurt and cause itching.
(vi) Some plant wastes are very useful to human beings. e.g. rubber latex, gum, resins and essential oils like eucalyptus or sandalwood oil.

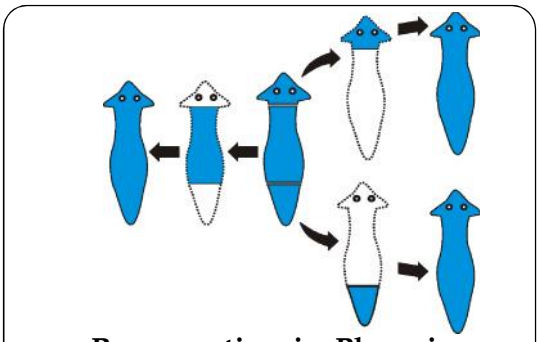
(4) **2**

Regeneration :
(i) The capacity to regenerate is very high among some animals. They can reconstruct the entire body from the isolated body cells.
(ii) Regeneration is carried out by specialised cells. These cells proliferate and make large number of cells which later develop

into various cell types and help in production of new organisms.

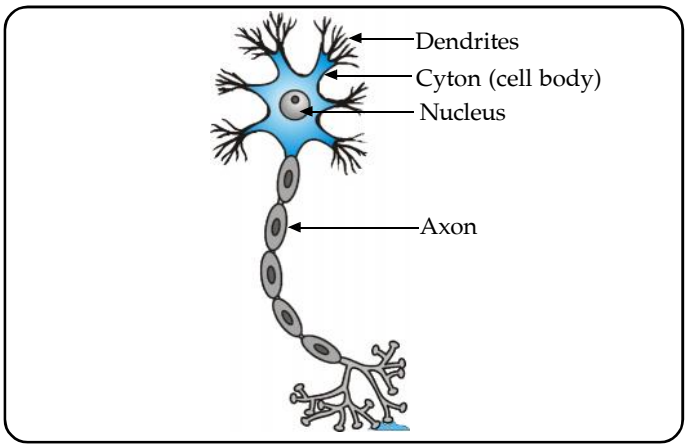
(iii) For example, when planaria is cut into many pieces, each piece develops into a whole planaria.

(iv) This process occurs only if the planarial body gets cut into pieces. But animals cannot wait to be cut to reproduce. So regeneration is not the same as reproduction.



Regeneration in Planaria

(5) Neuron **2**



(6) **2**

(i) Today the world is talking about the development in industry, housing, medicines, infrastructure etc.

(ii) To achieve this development, various resources are used.

(iii) Sustainable use is the use of these resources to achieve growth and rise in the standard of living without harming the environment.

Q.3. Answer the following subquestions : (any five)

(1) **3**

The movement of plants in response to the stimulus of touch is called seismonastic movement. Examples of seismonastic movement are :

(i) closing of the leaflets of mimosa plant on touching the leaves.

(ii) inward curling of the tentacles present on the drosera when an insect sits on it, so as to trap the insect.

(2)	(i) Reduce, reuse and recycle is the three 'R mantra'. This is an effective way to eliminate waste and conserve resources. (iii) Reduce means using fewer resources in the first place. (iv) Reuse means instead of throwing things away, try to find ways to use them again. (v) Recycle means the items are put through a process that makes it possible to create new products out of the materials from the old ones. (vi) Reducing, reusing and recycling cut the amount of energy used to produce new items and amount of pollution generated as a result. It also conserves valuable natural resources that would otherwise be used to produce new items from raw materials.	**3**
(3)	(i) Darwin's theory explains the process of how evolution took place. He suggested that only the fittest survive and the others die. (ii) The species then pass on these characteristics to the next generation which in turn helps them to survive. (iii) Only those factors which help any individual to survive are retained and others are lost. (iv) This process continues from generation to generation and in the struggle for survival among individuals, only those possessing the factors at greater levels survive. (v) These adapted individuals may be very different from the original species. This process is described as natural selection. (vi) Selection by nature is not deliberate but natural. (vii) The criterion for natural selection is only one i.e. successful adaptation for growth and reproduction in the given environment. (viii) The theory of natural selection helped to explain the process of development in living things. However, the theory did not explain how an individual plant or animal acquired factors that made it better adapted to its surrounding. (ix) Later the discovery of the laws governing heredity and mutation explained these findings and thus Darwin's theory came to be universally accepted.	**3**
(4)	The elements are sodium and calcium respectively. In the reactivity series, since sodium is placed above calcium, sodium is more reactive than calcium. When sodium reacts with dilute hydrochloric acid it gives sodium chloride and hydrogen gas is liberated. $2Na_{(s)} + 2HCl_{(aq)} \rightarrow 2NaCl_{(aq)} + H_2\uparrow$ Sodium + Hydrochloric acid → Sodium chloride + Hydrogen When calcium reacts with dilute hydrochloric acid, it gives calcium chloride and hydrogen gas is liberated. $Ca_{(s)} + 2HCl_{(aq)} \rightarrow CaCl_{2(aq)} + H_2\uparrow$ Calcium + Hydrochloric acid → Calcium chloride + Hydrogen	**3**

(5) **Functional groups :** **3**

(i) The atom or group of atoms present in the molecule which determines characteristic property of organic compound is called the functional group.

(ii) All organic compounds are considered as derivatives of hydrocarbons, it is formed by replacing one or more hydrogen atom in a molecule by some other atom.

(iii) In methane CH_4, if one hydrogen is replaced by an –OH group, then compound methyl alcohol, CH_3OH is formed. The –OH group is the alcoholic functional group.

(iv) After replacement, a new compound has functions i.e. properties different from the parent hydrocarbon.

Type of compound	General formula $R = C_nH_{2n+1}$ R=alkyl group	Functional group	Compounds containing functional group	
			Name	Formula
1. Alcohols	R – OH	– OH	Ethyl alcohol	C_2H_5 – OH
2. Aldehydes	R – CHO	H | (— C = O)	Acetaldehyde	H | CH_3– C = O
3. Ketones	O || R – C – R	O || — C —	Acetone (Dimethyl ketone)	O || CH_3– C –CH_3
4. Carboxylic acid	R – COOH	– COOH	Acetic acid	CH_3COOH

(6) (i) Photosynthesis **1**

(ii) Carbon dioxide, sunlight, water and chlorophyll **1**

(iii) $6CO_2 + 12H_2O \xrightarrow[\text{sunlight}]{\text{chlorophyll}} \underset{\text{glucose}}{C_6H_{12}O_6} + 6H_2O + 6O_2\uparrow + \text{energy}$ **1**

Q.4. Answer the following subquestion : (any one)

(1) The human male reproductive system consists of : **5**

(i) Testis : Produces sperms (male germ cells). As formation of sperms require temperature lower than the normal body temperature, testes are located outside the abdominal cavity in the scrotum. Testes secrete the hormone testosterone which brings about changes in boys during puberty.

(ii) Epididymis : Immature sperms travel to the epididymis for development and storage.

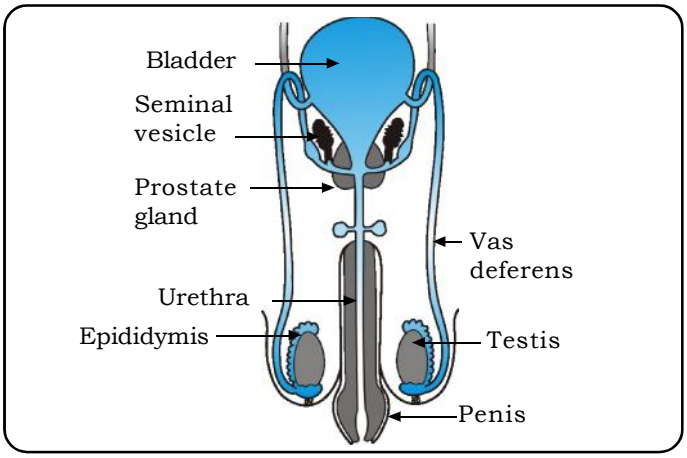
(iii) Vas deferens : It is a passage through which the sperm travels towards the urethra.

(iv) Seminal vesicle and prostate glands : They produce the ejaculatory fluid which helps the sperm in transport and

provides nutrition.

(v) Penis : It is the portion of the reproductive system that delivers the sperms to the site of fertilization.

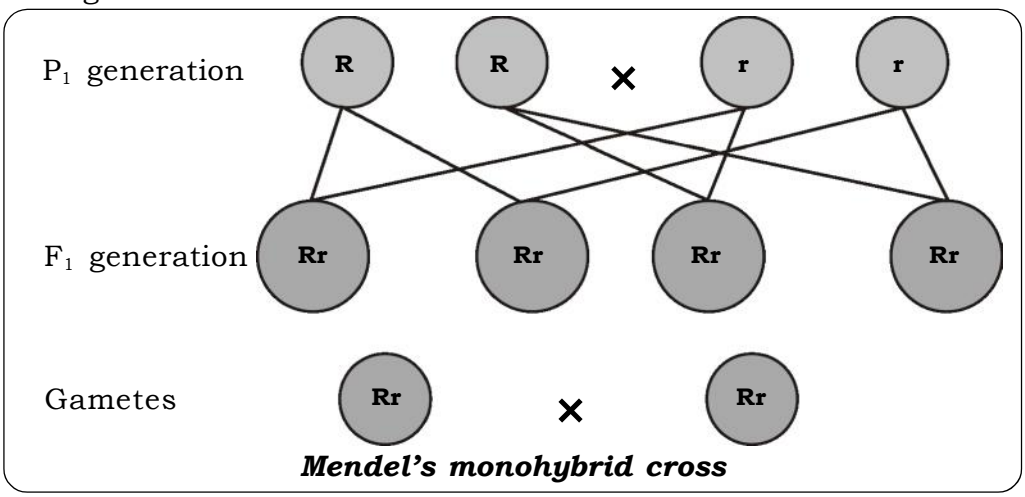
(vi) Sperms : A sperm cell is composed of a head which carries the genetic information, a middle part which carries mitochondria for energy production and a tail which is like a flagellum to help in movement towards the female germ cells.



(2) (1) Mendel made several crosses of pea-plants involving only one pair of contrasting characters. Such crosses are termed as 'Monohybrid crosses'. **5**

(2) e.g.: Mendel's cross of red-flowered and white flowered pea-plants.

(3) When a pure red-flowered (RR) pea plant is crossed with pure white flowered (rr) pea plant, all the plants produced in F1 generation are red-flowered.



Mendel's monohybrid cross

When F1 plants are self-crossed,
F2 generation

♀ \ ♂	R	r
R	RR	Rr
r	Rr	rr

The phenotypic ratio is 3 red : 1 white.
The genotypic ratio is 1 RR : 2 Rr : 1 rr.

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