

GSEB
Batch :
10th Std.
Eng. Medium

MAHESH TUTORIALS
Subject : Science And Technology
Chapter : 4, 5, 10, 11, 15, 16, 17, 18
Model Answer Paper

Test -
Date:
Marks : 100
Time: 3 Hrs.

PART - A

Select a proper option (a), (b), (c) or (d) from those given below each questions : 50

1. (a) C
2. (b) 10^{-3}
3. (b) Copper plate, Zinc plate
4. (d) $V = IR$
5. (b) Current is same.
6. (b) Galvanometer
7. (a) Parallel to magnetic field
8. (a) N to S
9. (a) Faraday
10. (a) Increases
11. (b) Radio telescope
12. (c) Ultraviolet
13. (c) Jupiter
14. (b) CO
15. (c) 22.5
16. (a) Pluto
17. (b) 1986
18. (a) 28
19. (a) 80%
20. (a) Cyclopentane
21. (d) Boiling points
22. (b) 0
23. (c) -OH
24. (a) $C_nH_{2n+1}OH$
25. (b) Membrane technology
26. (b) 5
27. (b) Propanone
28. (a) Addition reaction
29. (c) Methanol; copper sulphate
30. (d) Amoeba
31. (a) Hydra
32. (a) Buds
33. (d) Amoeba
34. (b) Estrogen and progesterone
35. (c) On chromosomes
36. (b) Meiosis
37. (a) All plants obtained were tall
38. (a) $2A + XX$
39. (c) A or B
40. (c) Ecosystem
41. (c) Sunlight
42. (c) Biological magnification
43. (a) Trophic level
44. (d) Higher carnivorous
45. (b) 4
46. (b) 18999
47. (a) Biotic and renewable
48. (d) Success of the gene bank
49. (a) rainfall
50. (a) Dam



PART - B
SECTION - A

Answer the following questions : [2 marks]

10

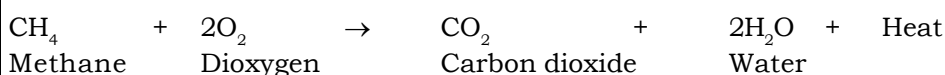
1. The rocks that failed to form a planet during the time of the formation of the solar system are known as asteroids. ½
- ⇒ Majority of them are found in a belt lying between the Mars and Jupiter . Such rocks are of various sizes. ½
- ⇒ They revolve around the sun. Number of asteroids are approximately more than 1 lac out of which orbits of more than 4000 asteroids are now determined. ½
- ⇒ Asteroids have irregular shapes. Size of these asteroids can be estimated on the basis of their luminosity. ½
- ⇒ The first ever discovered and the largest asteroid is Ceres. Its diameter is approximately 1000 km. Luminous asteroid vesta is approximately 400 km. ½

OR

1. It is the smallest planet in the solar system. Its mass is approximately $\frac{1}{18}$ mass of the earth. ½
- ⇒ It contains metals like nickel (Ni) and iron (Fe) at the centre. Its outer surface is rocky. ½
- ⇒ Strength of its gravitational force is approximately one third of the earth. Due to weak gravitational field and short distance from the sun, it has a very thin atmosphere containing vapours of potassium and sodium. ½
- ⇒ As a result, difference between day and night temperatures is very large. Temperature of the side facing the sun is 427°C whereas night temperature is - 173°C. ½
- ⇒ Due to such extreme temperature difference life is not possible on mercury. ½
- ⇒ Its surface has many craters. Some of them are volcanoes. Most of the craters were formed due to hitting of meteors. Mercury has no moon. ½
2. When we pass the electric current in the bulb, our experience says that after a while it becomes warm. ½
- ⇒ In the same way, by passing of an electric current through electrical appliances like iron or heater, the heat is produced. ½
- ⇒ Here, electrical energy is converted into heat energy which is known as heating effect of an electric current. ½
- ⇒ In the same way the electrical energy is transformed into heat energy due to the resistance. ½
3. LPG (Liquefied Petroleum Gas) contains gases mainly butane and in small proportions propane and butene. ½
- ⇒ The gaseous mixture is liquefied under high pressure and filled in cylinders at high pressures. ½
- ⇒ To know the leakage of the gas from the cylinder, methyl mercaptan having very bad smell is mixed. ½
- ⇒ LPG is mostly used as household fuel. ½

OR

3. It is a combustible gas and so it is a combustible substance. ½
- ⇒ It burns with blue flame when burnt in air and gives carbon dioxide and water. ½



4. **Given** : $V = 2.5 \text{ V}$ ½
- $I = 500 \text{ mA} = 0.5 \text{ A}$ ½
- $t = 1 \text{ min} = 60 \text{ secs.}$ ½
- $P = ?$ ½
- $W = ?$

Formula : $P = V \times I$
Solution : $P = 2.5 \times 0.5$
 $P = 1.25 \text{ watt}$
 $W = P \times t$
 $= 1.25 \times 60$
 $= 75 \text{ joules}$

½
½
½
½

5. We know that an electrical shock and fire are the main accidents caused by electricity.

½

Sometimes short circuit occurs in an electrical circuit.

½

⇒ Short circuit means when positive and negative wires are connected with each other accidentally.

⇒ If the insulating layer of wires or appliance in the circuit is defective, then short circuit may occur.

½

⇒ In this circumstances, the total resistance of circuit suddenly decreases and an excessive electric current flows according to Ohm's law, which results in lots of heat and a spark is produced at a point of short circuit. Therefore, there is a possibility of a fire.

½

SECTION - B

Answer the following questions : [2 marks]

10

6. It is used as solvent in industry and in lacquers, varnish, and in fragrant materials like perfumes and in medicine also.

½

⇒ As it is antiseptic, it is used for dressing and cleaning of boils.

⇒ As ethanol should not be used as toxic drink, harmful substances like methanol, copper sulphate are mixed with it.

½

½

⇒ Ethanol solution containing 5% water is called rectified spirit which is useful for making the outer surface of the body germ-free, 100% ethanol is called absolute alcohol.

½

7. The process by which the organisms, produced new organism like them during their life time is known as 'reproduction'.

½

⇒ Mainly there are two methods of reproduction Asexual Reproduction and Sexual Reproduction

⇒ **Importance of Reproduction :**

½

(1) Maintain the existance of each species.

(2) Transfer of hereditary characters into successive generation.

½

(3) Bring concomitant changes in evolutionary events.

½

8. Oxygen molecule absorbs photons and undergo a chemical reaction called photodissociation or photolysis.

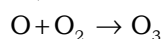
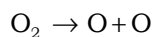
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⇒ A single molecule of oxygen breaks down into two oxygen atoms.

½

⇒ The free oxygen atom then combines with an oxygen molecule and forms a molecule of ozone(O₃).

½



½

9. Fossils- The impressions of dead plants or animals that lived in the past.

½

→ Plants or animals when die are decomposed by micro organisms in the presence of moisture and oxygen.

½

→ Due to some environmental conditions bodies do not decompose completely.

½

→ Such body parts of the plants or animals become fossils.

½

OR

9. Heredity is transmission of characters from parents to the offsprings.

½

→ This involves the tendency of every individual to resemble their parents.

½

→ Hereditary information is present in the fertilized egg or zygote.

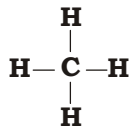
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10. There are three R's to save the environment-

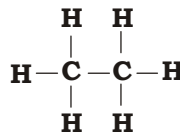
mI = 0.73 A

13. In saturated hydrocarbons, each carbon atom is combined with other atoms by only one single covalent bond viz.

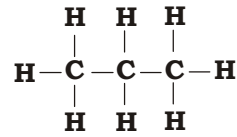
⇒ Methane (CH_4), ethane (C_2H_6), propane (C_3H_8), butane (C_4H_{10}) pentane (C_5H_{12}) etc.



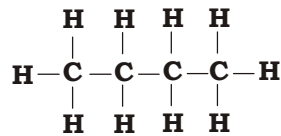
Methane



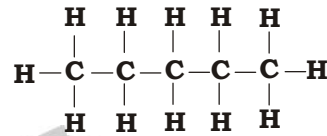
Ethane



Propane



Butane



Pentane

14. Waste are classified into two major terms:

- (a) Solid and
(b) Liquid forms.

⇒ All the waste material produced by the various activities of man and animals are poisonous to some extent and can be divided into two major groups-

(a) Biodegradable Waste:- The waste material which can be broken down by biological processes i.e. by the action of microorganisms into non-poisonous substances in nature is called as Biodegradable waste. Example vegetables, fruits, cow dung etc.

(b) Non-biodegradable Waste:- The waste material which cannot be broken down by biological processes i.e. by the action of microorganism into non-poisonous substances is called non-biodegradable waste. Example plastic, polyethene, DDT, glass, metals.

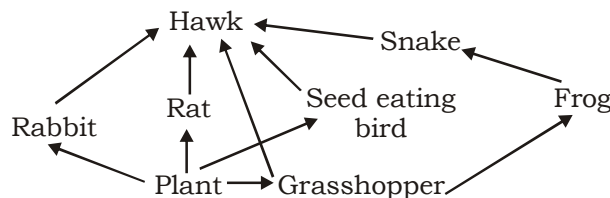
OR

14. The inter connected food chains operating in an ecosystem which establish a network of relationship between various species is called food web.

⇒ The network of large number of food chains existing in an ecosystem is called a food web.

⇒ The animals of various food chains are inter dependent for food and form a net.

⇒ e.g.



15. The naturalists towards the forest conservation is Chipko Andolan.

→ It was originated in Reni in Garhwal since 1970s.

→ There was dispute between local villagers and contractor who allowed to fell trees in a forest near village.

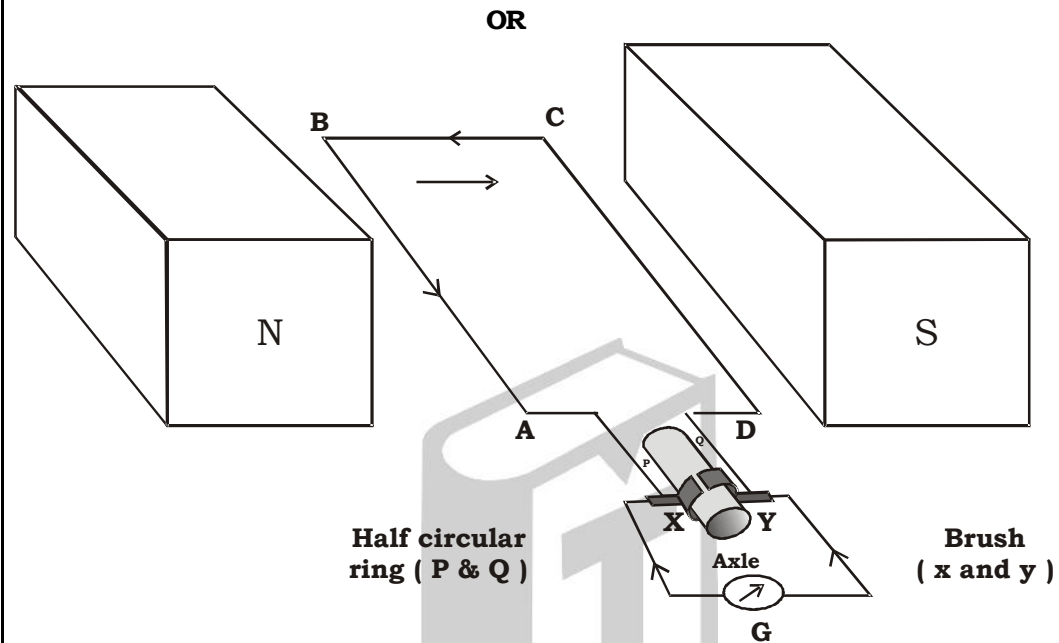
→ One day the women from the village reached the forest quickly and clasped the tree trunks preventing the workers from felling trees.

→ Thus trees were saved.

upward direction. As these two forces are in the mutual opposite directions, the loop ABCD is rotated.

- ⇒ After the completion of half rotation, the ring Q comes in contact with the brush X and the ring P with the brush Y, so that the direction of an electric current gets reversed. 1/2
- ⇒ Due to this, the direction of force acting on AB and CD is also reversed. As a result, the loop continues to rotate in the same direction. At the end of one rotation loop comes to the earlier position. 1/2
- ⇒ Thus, after every half rotation the direction of an electric current in a loop changes and loop rotates continuously. 1/2

17.



- ⇒ Electric generator converts mechanical energy into electrical energy. It works on the principle of an electromagnetic induction. 1/2
- ⇒ The construction of an electric generator is like the construction of an electric motor which is shown in Figure. 1/2
- ⇒ The two ends of a loop ABCD are placed in a magnetic field and are connected with two semi-circular rings P and Q. 1/2
- ⇒ These two rings are insulated from each other. These rings can slide while remaining in contact with the brushes X and Y. 1/2
- ⇒ A galvanometer is connected between the two ends of brush. By applying mechanical rotation to the loop ABCD in the magnetic field, the number of magnets field lines associated with it changes so that an electric current is induced which is observed from the deflection of galvanometer. 1/2
- ⇒ Thus, the mechanical energy is converted into electrical energy. 1/2
- ⇒ By rotating the loop in a magnetic field, the side AB moves upward and the side CD move downwards. The direction of an induced electric current in wire AB and CD can be known by Fleming's right hand rule. As shown in the Figure, induced electric current flows in a path B-A-G-D-C. 1/2
- ⇒ After the half rotation of a loop, the ring P comes in the contact with brush Y and the ring Q with the brush X. Here, the brush X is always in contact with the side moving upwards while the brush Y is always with the side moving downwards as a result of which the current flows only in one direction. 1/2
- ⇒ This current is called direct or DC current. This type of generator is called DC generator. Similarly instead of half ring if full ring is used then A.C. current can be generated and such generator is called A.C. generator. 1/2

18.

No.	Male reproductive system	Female reproductive system	
1.	Testes, epididymis, seminal vesicle, prostate gland and penis are included in it.	Ovary, oviduct, uterus and vagina are included in it.	1
2.	Testes are located in the scrotal sac outside the abdominal cavity.	Ovaries are located in the abdominal cavity.	
3.	The vas deference, joins with urinary duct coming from urinary bladder to form urethra.	The oviducts from two sides open in the muscular uterus.	1
4.	The anterior part of penis having genital pore, its act as urinogenital opening.	In female, the urinary opening and genital opening are separate.	1
5.	Those organs are included which are related with production of sperms and transfer sperms to place of fertilization.	Those organs are included which are related with production of ovum, implantation of embryo and birth of child.	1

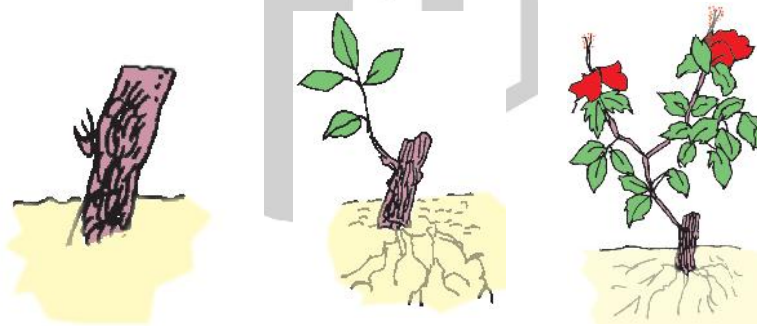
OR

18. Artificial propagation is a artificial method to produce many plants from a single plant.

⇒ Three common method are - Cutting, Layering, and Grafting.

⇒ **Cutting** - is a process in which a cutting of stem or leaf or shoot having some buds on it is taken and its lower part is buried in the moist soil.

⇒ The cutting later develops roots and grows into plant similar to the parent plant.
Eg - Rose, Bougainvillae

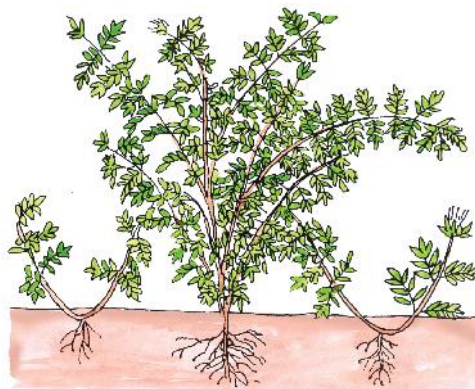


Cutting

⇒ **Layering** - A part of stem is pulled towards the ground and covered by the soil.

⇒ Once the covered part develops its own roots it behave independently and is detached from the parent plant and grows into mature plant.

Eg - Lemon, Crysanthemum.



Layering

⇒ **Grafting** - The cut stems of two different plants are joined in a way that they unite and grow as one plant.

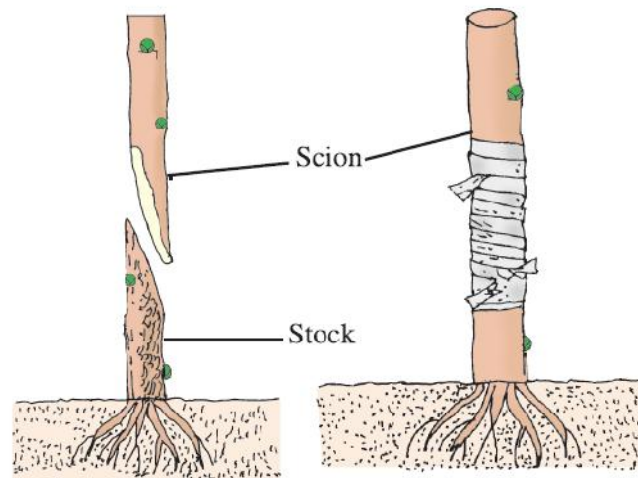
½

⇒ One plant part has roots and other is without roots.

Stock - is the stem having roots.

Scion - is the stem without root of another plant.

½



½

On stock of citrus scion of lemon can be grafted.

⇒ In this most desirable characters of the plants can be brought together.

½

★★★★ Best of Luck ★★★★★

