Chapter 5

Reproductive and Modification In Plants

Textual Evaluation

I. Choose the appropriate answer :

Question 1.

Vegetative propagation by leaves takes place in (a) Bryophyllum (b) Fungi (c) Virus (d) Bacteria

Answer:

(a) Bryophyllum

Question 2.

Asexual reproduction in yeast is (a) Spore formation (b) Fragmentation (c) Pollination (d) Budding

Answer:

(d) Budding

Question 3.

Reproductive part of a plant is (a) Root (b) Stem (c) Leaf (d) Flower

Answer:

(d) Flower

Question 4.

Pollinators are (a) Wind (b) Water (c) Insect(d) All the above

Answer:

d) All the above

Question 5.

Climbing roots are seen in (a) Betel (b) Black pepper (c) Both of them (d) None of them

Answer:

(c) Both of them

II. Fill in the blanks :

- 1. The male reproductive part of a flower is _____
- 2. _____ is the basal swollen part of the Gynoecium.
- 3. After fertilization the ovule becomes _____
- 4. Breathing roots are seen in _____ plants.
- 5. Onion and Garlic are example of _____

Answer:

- 1. Androecium
- 2. Ovary
- 3. seed
- 4. mangrove
- 5. Bulb

III. True (or) False, unrite the correct answer for the false statement.

Question 1.

A complete flower has four whorls.

Answer:

True

Question 2.

The transfer of pollen to the stigma is known as pollination.

Answer:

True

Question 3. Conical shaped root is carrot.

Answer:

True

Question 4.

Ginger is an underground root.

Answer:

(False) Correct Statement: Ginger is an underground stem.

Question 5.

Leaves of Aloe vera are fleshy and store water.

Answer:

True

IV. Match the following :

| 1. | Petal | (a) | Opuntia |
|----|-------------|-----|-----------------|
| 2. | Fern | (b) | Chrysanthemum |
| 3. | Phylloclade | (c) | Attracts insect |
| 4. | Hooks | (d) | Spore |
| 5. | Sucker | (e) | Bignonia |

Answer:

- 1. c
- 2. d
- 3. a
- 4. e
- 5. b

V. Very short answers.

Question 1.

Write two types of reproduction in plants.

Answer:

Sexual and Asexual Reproduction.

Question 2. What are the two important parts of a flower?

Answer: Androecium and Gynoecium.

Question 3. Define – pollination.

Answer: Transfer of pollen grains from the anther to stigma is called pollination.

Question 4. What are the agents of pollination?

Answer: Insects, wind, water, animals.

Question 5. Give example for (a) Corm (b) Tuber

Answer:

- 1. Corm-e.g Colocasia
- 2. Tuber e.g Potato.

Question 6. What is tendril?

Answer:

- 1. It is an elongated structure produced by the plant to help the plants to climb efficiently.
- 2. e.g In pea, the terminal leaflets are modified into a tendril.

Question 7. What are thorns?

Answer:

- 1. Thoms are pointed and sharp structures formed in a plant.
- 2. Leaves other parts may be modified into thorns.

3. It helps the plant to safeguard itself from animals. Thoms may also help in climbing.

VI. Short answer.

Question 1.

Differentiate bisexual flower from unisexual flower.

Answer:

| S. No. | Bisexual flower | Unisexual flower |
|--------|--|---|
| (a) | It has Androecium and Gynoecium | It has only Androecium or Gynoecium |
| (b) | It can undergo self pollination and cross pollination e.g : Hibiscus | They can be pollinated only by cross pollination eg : papaya. |

Question 2.

What is cross pollination?

Answer:

- 1. Pollen grains are transferred from the anther of one flower to the stigma of another flower of the same kind or different plant.
- 2. Plants need to produce pollen grains in larger quantities to increase the chance of pollination.
- 3. Cross pollination does introduce variations in characteristics of new plants.
- 4. Cross pollination is brought about by agencies like wind, water, animals and Insects of plums, apples.

Question 3.

Write notes on phyllode.

Answer:

In Acacia auriculiformis, petioles expand to form leaf like structure. They carry out the function of leaf (Photosynthesis).

VII. Answer in Details.

Question 1.

Write a brief account on pollination.

Answer:

Transfer of pollen grains from the anther to the stigma is called pollination. There are two types of Pollination. (a) Self Pollination

(b) Cross Pollination

(a) Self pollination

- 1. Pollen grains are transferred from the anther to the stigma of the same flower or to another flower of the same plant.
- 2. Plants do not need to produce pollen grains in a large quantity for self pollination.
- 3. It does not produce changes in the characteristics of new plants

(b) Cross Pollination

- 1. Pollen grains are transferee! for the anther of one flower to the stigma of anoter flower of the same kind or different plant.
- 2. Plants need to produce pollen grains in larger quantities to increase the chance of pollination.
- 3. Cross pollination does introduce variations in characteristics of new plants, e.g (apples, plums)
- 4. Agents like wind, water, insects and animals are helpful for pollination and are known as pollinators.
- 5. Wind pollinated plants produce pollen which are light. Insect pollinated flowers are brightly coloured and produce lot of pollen which sticks to the body of insects and are caused to other plants.
- 6. Pollination that occurs in nature is called Natural pollination.
- 7. Pollination between desired plants can be brought about by artificial methods.

Question 2.

Explain the underground stems.

Answer:

There are some stems that grow under the ground to store food. These underground stems swell and become thick.

There are four types of underground stems:

- 1. Rhizome.
- 2. Corm
- 3. Tuber
- 4. Bulb

(i) Rhizome : It is an underground thick stem with nodes and intemodes with scale , leaves at the node. It grows horizontally and has an irregular shape.

Rhizome have buds. It gives rise to new stem and leaves. E.g. Ginger and Turmeric.

(ii) Corm: This underground stem is round in shape and flat at the top and bottom. It

is a condensed form of rhizome and bears one or more buds in the axils of scale leaves. Daughter plants arise from their buds. E.g. Colocasia.

(iii) Tuber: It is an enlarged, spherical underground stem that stores food. It has many dormant buds on its surface known as "Eyes". If we plant a part of tuber with the bud, it grows into a new plant. E.g. Potato.

(iv) Bulb: It is condensed stem which is disc like and stores food in the fleshy leaves. The bulb has two types of leaves.

- 1. Fleshy Leaves
- 2. Scaly Leaves

The upper part of the stem has a terminal bud and it is covered by many scaly leaves, the inner fleshy leaves store food as seen in Garlic and Onion

VIII. Higher Order Questions :

Question 1.

Ginger is considered to be a stem, not a root. Why?

Answer:

Ginger has the following characteristics of a stem.

- 1. It has scale leaves
- 2. It has nodes and Intemodes
- 3. It has axillary buds and a terminal bud. Therefore Ginger is considered to be a stem but is is a modified underground stem which stores food.

Question 2.

What will happen if pollen grain of rose gets deposited on stigma of lily flower? Will pollen germination takes place? Why?

Answer:

No pollen of rose will get wasted and will not germinate on the stigma of lily flower. This is because pollen of a flower is compatible (match) only with stigma of a flower of the same species.

IX. Assertion and Reasoning types of Question :

Question 1.

Assertion : Pollination and fertilization in flowers, produces fruits and seeds. Reasoning :After fertilization the ovary becomes fruit and ovule becomes seed.

- (a) Assertion is correct, Reasoning is incorrect
- (b) Assertion is incorrect, Reasoning is correct
- (c) Assertion is correct, Reasoning is correct
- (d) Assertion is incorrect, Reasoning is incorrect

Answer:

(c) Assertion is correct, Reasoning is correct.

Question 2.

Assertion : The example of conical root is carrot. Reasoning : It is an adventitious root modification.

- (a) Assertion is incorrect, Reasoning is correct.
- (b) Assertion is incorrect, Reasoning is incorrect
- (c) Assertion is correct, Reasoning is correct
- (d) Assertion is correct, Reasoning is incorrect

Answer:

(a) Assertion is incorrect, Reasoning is correct.

X. Picture Based question.

Question 1.

Observe the picture and draw the labels. Parts of a Flower Label the parts below :



Answer:

- 1. Stigma
- 2. Pistil
- 3. Filament
- 4. Ovule
- 5. Sepal
- 6. Stamen

Question 2.

Identify the four plants shown in the following Name the different modification in each of them.

| | Name | Modification |
|----|------------|--------------|
| 1. | Garlic | |
| 2. | Turnip | |
| 3. | Rose plant | |

Answer:

| | Name | Modification |
|----|------------|---|
| 1. | Garlic | Underground stem modification |
| 2. | Turnip | Top Root modified for storage (Top shaped) |
| 3. | Rose plant | Stem used for vegetative propagation / Asexual Reproduction by cutting |
| 4. | Maize | Stilt Roots (Adventitious roots produced from the node for mechanical support). |

Intext Activities

Activity 1

Using the information from the above complete the following table:

| SI.No. | Name of the flower | Complete / incomplete | Unisexual / bisexual | If unisexual male or female |
|--------|-----------------------|--------------------------|-------------------------|---|
| 1. | Hibiscus | Complete | Bisexual | Both male & female present is same flower |

| 2 | Pumpkin | Incomplete | Unisexual | Male in separate single flower & female in separate single flower |
|----|---------|------------|-----------|---|
| 3. | Rose | Complete | Bisexual | Both male & female present is same flower |
| 4. | Coconut | Incomplete | Unisexual | Male in separate single flower & female in separate single flower |
| 5. | Jasmine | Complete | Bisexual | Both male & female present is same flower |

Additional Questions

I. Choose the appropriate answer.

Question 1.

_____ do not produce spores.

- (a) Algae
- (b) Fungi
- (c) Datura
- (d) Ferns

Answer:

(c) Datura

Question 2.

_____ have the smallest seeds in the plant kingdom.

- (a) Coconut
- (b) Orchids
- (c) Onion
- (d) Pumpkin

Answer:

(b) Orchids

Question 3. Breathing Roots are seen in _____ (a) Tarpa (b) Avicennia (c) Eicchomia (d) pisum

Answer:

(b) Avicennia

Question 4.

_____ is a parasite.

(a) Cuscuta(b) Hibiscus(c) yeast(d) Spirogyra

Answer:

(a) Cuscuta

Question 5.

fIn ______ sepal is seen on the fruit after fertilization (a) Brinjal (b) Pumpkin (c) Onion (d) Garlic

Answer:

(a) Brinjal

II. Fill in the Blanks.

- 1. The tissue seen in epiphytic roots is called ______
- 2. Cactus is a example for _____
- 3. Ginger and _____ are examples of Rhizome.
- 4. In Gloriosa ______ is modified into a tendil leaf tip.
- 5. Spirogyra reproduces by _____

Answer:

- 1. Velamen
- 2. Phylloclade
- 3. Turmeric
- 4. leaf tip
- 5. fragmentation

III. True or False – if false give the correct statement.

Question 1.

In cactus stem is modified into spines.

Answer: (False) In cactus, leaf is modified into spines

Question 2. Ovules fall off after fertilization.

Answer: (False) Style and stigma fall off after fertilization.

Question 3. In Nepenthes, leaf is modified into a flask shaped structure.

Answer:

True

Question 4.

Tuber is an enlarged underground root.

Answer:

(False) Tuber is an enlarged underground stem.

Question 5.

Scaly leaves are seen in onion.

Answer:

True

IV. Match the following :

Question 1.

| Vanda | (a) | Climber |
|-----------------|-----|---------------|
| Реа | (b) | epiphyte |
| Eicchomia | (c) | offset |
| wild strawberry | (d) | Runner stolon |

Answer:

1. b

- 2. a
- 3. c
- 4. d

Question 2.

| Pollen | (a) | anther |
|--------|-----|------------|
| Ovule | (b) | protection |
| stamen | (c) | Powdery |
| Sepal | (d) | Seed |

Answer:

- 1. c
- 2. d
- 3. a
- 4. b

V. Assertion and Reason types of Question.

(a) Assertion is correct, Reason is incorrect

(b) Assertion is incorrect, Reason is correct

(c) Assertion is correct, Reason is correct

(d) Assertion is incorrect, Reason is incorrect

Assertion : In potato shoot arises from eyes. Reason : Eyes represent the buds.

(c) Assertion is correct, Reasoning is correct.

Assertion : In Banyan prop roots grow horizontally from the tree.Reason : They give additional support to the tree.(b) Assertion is incorrect, Reasoning is correct.

Assertion : Corm is a condensed form of Bulb.Reason : It has dry and fleshy scale leaves.(d) Assertion is incorrect, Reasoning is incorrect.

VI. Find the odd one out.

Question 1. Pollen, anther, ovule, filament Ovule Reason : It is a part of Gynoecium whereas others are parts of Androecium.

Question 2.

Corm, Bulb, Rhizome, sucker

Answer:

Sucker

Reason : It is a sub aerial stem modification whereas others are underground stem modification.

Question 3. Haustoria, Velamen, Prop Roots, Phylloda.

Answer:

Phylloda

Reason : It is a leaf modification whereas others are root modifications.

VII. Complete the table

Question 1.

| Underground stem | (1) | Ginger | |
|-------------------|---------------|--------|--|
| (2) | Runner | (3) | |
| Leaf modification | (4) | Acacia | |
| Root modification | sucking Roots | (5) | |

Answer:

- 1. Rhizome
- 2. Sub aerial stem
- 3. Centella
- 4. phylloda
- 5. Cuscuta.

Question 2.

| Caly x | (1) | (2) |
|------------|-------|---------------------------|
| (3) | petal | attract insects |
| Androecium | (4) | Male reproductive part |
| (5) | (6) | Female reproductive part. |

Answer:

- 1. sepal
- 2. protection
- 3. corolla
- 4. stamen
- 5. Gynoecium
- 6. Ovary, style, stigma.

VIII.Very short answers:

Question 1. Name the whorls of a flower

Answer: Calyx, corolla, Androecium and Gynoecium.

Question 2. What is an inflorescence?

Answer: A group of flowers is called an inflorescence, e.g sunflower.

Question 3. What is fertilization.

Answer:

Male gamete fuses with the female gamete to form zygote. This process is known as fertilization.

Question 4. Name the sub aerial modifications of stem.

Answer: Runner, stolum, sucker, offset.

Question 5. Name the underground stem modifications.

Answer: Rhizome, **Corm**, Tuber, Bulb.

Question 6. What are sucking Roots?

Answer:

- 1. Sucking roots (or) Haustoria are found in parasite plants.
- 2. These roots penetrate the tissues of host plant and suck nutrients from then, e.g cuscuta.

Question 7. Differentiate Phyllode and Phylloclade.

Answer:

| Phyllode | Phylloclade |
|---|---|
| Petioles are modified to form leaf like | stem is modified to form leaf like structure, |
| structure, e.g. Acacia. | e.g. Cactus. |

Question 8.

What are breathing Roots or Pneumatophores?

Answer:

- 1. Mangrove plants roots which are seen above the ground for the purpose of gaseous exchange.
- 2. These roots are erect, peg like structures with numerous pores through which air circulates.
- 3. These roots are called breathing roots, or pneumatophores. e.g Avicennia.

IX. Short answers.

Question 1.

List the post fertilization changes in a flower.

Answer:

- 1. Calyx sometimes persist with fruit
- 2. Petals wither / fall off
- 3. Androecium fall off
- 4. Pistil remain and develops into a fruit
- 5. Style and stigma fall off
- 6. Ovary enlarges to store food materials and develops into a fruit.
- 7. Ovules present inside the ovary develops into seeds.

Question 2.

Write a note an roots modified for mechanical support.

Answer:

Many Plants require additional support. Such plants develop roots on their aerial parts to provide mechanical support. These roots grow downward and act as supportive organs. There are three types of modified roots for support.

1. Prop roots : Roots are modified to provide mechanical support as seen in Banyan tree. These roots grow vertically from horizontal branches of a tree.

- 2. Stilt roots : In sugarcane, and maize adventitious roots arise from the nodes in cluster at the base of the stem. These roots are called stilt roots which gives additional support.
- 3. Climbing roots : In betel and black pepper, nodes or intermodes bear roots which help in climbing.

Question 3.

How do Epiphytic roots differ from Sucking roots?

Answer:

| Epiphytic roots | Sucking roots |
|--|---|
| | Cuscuta a parasite plant, climb the trees and |
| Vanda is an epiphytic plant, which grows | other vegetation and use the haustorial roots |
| on trees. The velamen tissue present in | Sucking roots to penetrate the tissue of the |
| the epiphytic root, absorbs moisture, to | host plant and suck nutrients from them. They |
| perform photosynthesis. | are usually found in parasitic plants that |
| | depend on the host plants for nutrients. |

Question 4.

Write a note on phylloclade.

Answer:

- 1. Plants growing in deserts try to store water. If the surface area is large, more water is lost by evaporation.
- 2. In plants like cactus, the stem is thick and becomes flat like leaves to do photosynthesis.
- 3. The leaves are reduced to small spines with less surface area. This kind of modification is called phylloclade. e.g. cactus.

Question 5.

What are traps or Insectivorous plants?

Answer:

- 1. These plants grow in nitrogen deficient places. In Nepenthes, the leaves are modified into a flask like structure, which is used to attract insects and other tiny animals.
- 2. The inner wall of the leaf secretes digestive enzymes that help to digest the insects and extract the nitrogen needed for the plant. E.g. Nepenthes.

Question 6. Differentiate self pollination and cross pollination.

Answer:

| S.no | Self pollination | Cross pollination |
|------|--|---|
| 1. | Pollen grains are transferred from the anther to the stigma of the same flower or to another flower of the same plant. | Pollen grains are transferred from the anther of one flower to the stigma of another flower of the same kind or different plant. |
| 2. | Plants do not need to produce pollen grains in a large quantity for self pollination | Plants need to produce pollen grains in larger quantities to increase the chance of pollination. |
| 3. | It does not produce changes in the characteristics of new plants. | Cross pollination does introduce variations in characteristics of new plants. |

Question 7.

Identify the plant and the modification seen in it



Answer: Chrysanthemum Modification : Sucker (sub aerial stem modification).

X. Answer in detail

Question 1. Write a note an sub aerial modifications of the stem.

Answer:

Sub- aerial Modifications : Stem of some plants remains sub- aerial which grow horizontally on the surface of the soil for the purpose of reproduction. There are four types.

1. Runner: The stem grows laterally on the surface of the soil, breaks up to produce roots where it touches the ground to give rise to new plants. Eg: Centelk (Vallarai).

- 2. Stolon: Stolon is a slender branch of the stem that grows upwards to some distance and then bends towards the ground. Upon touching the ground, it gives rise to a new plant. Eg. Wild strawberry.
- 3. Sucker Sucker is a short and weak lateral branch that grows diagonally upwards and directly gives rise to a new shoot. Eg. Chrysanthemum.
- 4. Offset: An offset is a short and thick branch that arises from the axial part of a leaf. It has thick intemodes. It produces a tuft of leaves and cluster of small roots below. Eg: Eichhornia.

Question 2.

Draw a diagram to show the life cycle of a plant.

Answer:



XI. Higher Order Questions : (HOTS)

Question 1.

Parasitic plants lack leaves.

Answer:

Parasites are plants which live on other living plants and derive nutrients from them. They are non-green and do not photosynthesize. They have sucking roots to absorb the nutrients directly from the host tissue. Thus they lack leaves.