IMPORTANT QUESTIONS CLASS – 11 BIOLOGY CHAPTER -5 MORPHOLOGY OF FLOWERING PLANTS

Question 1.
What are the functions of the root system?

Answer:
The main functions of the root system are as follows:
(a) Absorption of water and minerals from the soil.
(b) To provide a proper anchorage to the plant parts.
(c) To store reserved food material
(d) Synthesis of plant growth regulators

Question 2.
Write a note on different types of root systems.

Answer:
(a) In most of the dicotyledonous plants, the direct elongation of the radicle leads to the formation of primary roots which grows inside the soil. The primary roots and their branches constitute the taproot system. For example-mustard plant.

(b) In monocotyledonous plants the primary root is short-lived and is replaced by a large number of roots. Their roots originate from the base of the stem and constitute the fibrous root system. For example wheat plant.

(c) In some plants, roots arise from parts of the plant other than the radicle. Such roots are called adventitious roots. For example grass, banyan tree etc.

Question 3.
Write a short note on the stem.

Answer:
The stem is the ascending part of the axis bearing branches leaves, flowers and fruits. It develops from the plumule of the embryo of a germinating seed. The stem bears nodes and internodes. The region of the stem where leaves are born is called nodes while the portion between two nodes is called an internode. The stem is generally green when young and later becomes woody and dark brown.

Question 4.
What are the functions of petiole and lamina?

Answer:
Functions of petiole:
(a) The petiole helps hold the blade to light.
(b) It allows leaf blades to flutter in wind, thereby cooling the leaf and bringing fresh air to the leaf surface.

Functions of Lamina
(a) The veins of the lamina provide rigidity to the leaf blade
(b) It acts as channels of transport for water, minerals and food materials.

Question 5.
What do you mean by phyllotaxy?

Answer:
The pattern of arrangement of leaves on the stem or branch is termed phyllotaxy.

It is usually of three types:
(a) Alternate: A single leaf arises at each node in an alternate manner, as in a china rose.
(b) Opposite: A pair of leaves arise at each node and lie opposite to each other as in calotropis and guava plants.
(c) Whorled: When more than two leaves arise at a node and form a whorl, as in Alstonia

Question 6.
What is inflorescence? Name two types of inflorescences.

Answer:
The arrangement of flowers on the floral axis is termed an inflorescence

Types of inflorescences:
(a) Racemose: In racemose the main axis continues to grow, the flowers are borne laterally in acropetal succession.
(b) Cymose: In the cymose type of inflorescence, the main axis terminates in a flower. The flowers are borne in a basipetal order.

Question 7.
Write a note on the symmetry of a flower.

Answer:
The flower may be actinomorphic (radical symmetry) or zygomorphic (bilateral symmetry) in symmetry.
(a) Actinomorphic: When a flower can be divided into two equal radical halves in any radical

plane passing through the centre, it is said to be actino-morphic, e.g., mustard, datura, chilli. (b) Zygomorphic: When a flower is divided into two similar halves only in one particular vertical plane, it is said to be zygomorphic, e.g., pea, bean, cassia.

Question 6.
Write a short note on the fruit.

Answer:
Fruit is a natural or ripened ovary, developed after fertilization.

Fruit is called a parthenocarpic fruit if it is formed without fertilization of the ovary.

The fruit consists of a wall or pericarp and seeds. The pericarp may be dry or fleshy. If the pericarp is thick and fleshy, it is differentiated into the outer part called epicarp, a middle part called mesocarp and an inner part called the endocarp.

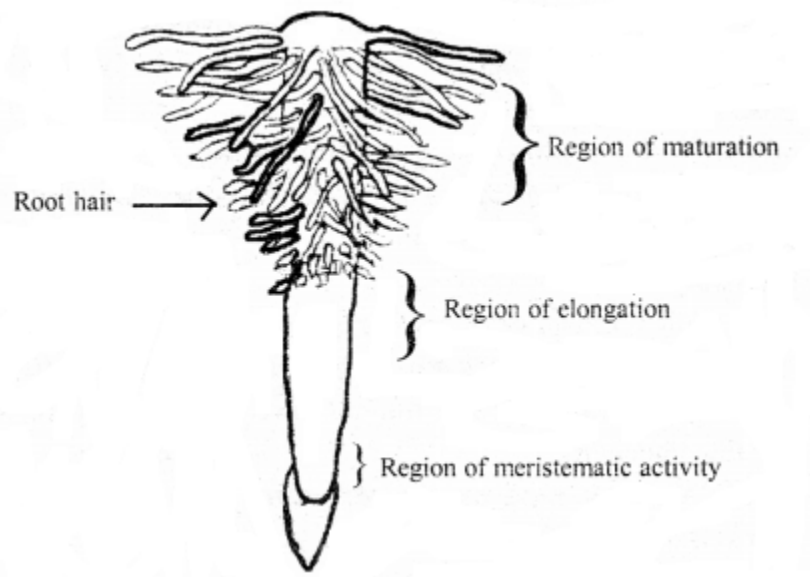
Question 7.
Write a note on the structure of a dicotyledonous seed.

Answer:
The outermost covering of a seed is called the seed coat. The seed coat has two layers, the outer testa and the inner tegmen. The developing seeds are attached to the fruit by means of a scar called the hilum, on the seed coat. A small pore called the micropyle is situated above the hilum. In the inner region of the seed coat is the embryo, consisting of an embryonal axis and two cotyledons. The cotyledons are fleshy and full of reserve food materials. At the end of the embryonal axis are present the radicle and the plumule.

Question 8.
Write a note on the regions of the root.

Answer:
At the apex, the root is covered by a thimble-like structure called the root cap. The root cap protects the tender apex of the root as it penetrates the soil. A few millimetres above the root cap is the region of meristematic activity. The cells present in this region are very small, thin-walled and with dense protoplasm.

The cells proximal to this region undergo rapid elongation and enlargement and are also responsible for the growth of the root in length. This region is called the region of elongation. The cells of this region gradually differentiate and mature. This zone proximal to the region of elongation is called the region of maturation. Some epidermal cells, from this region, form very fine and delicate, thread-like structures called root hairs. The functions of these root hairs are to absorb water and minerals from the soil.



The regions of the root-tip

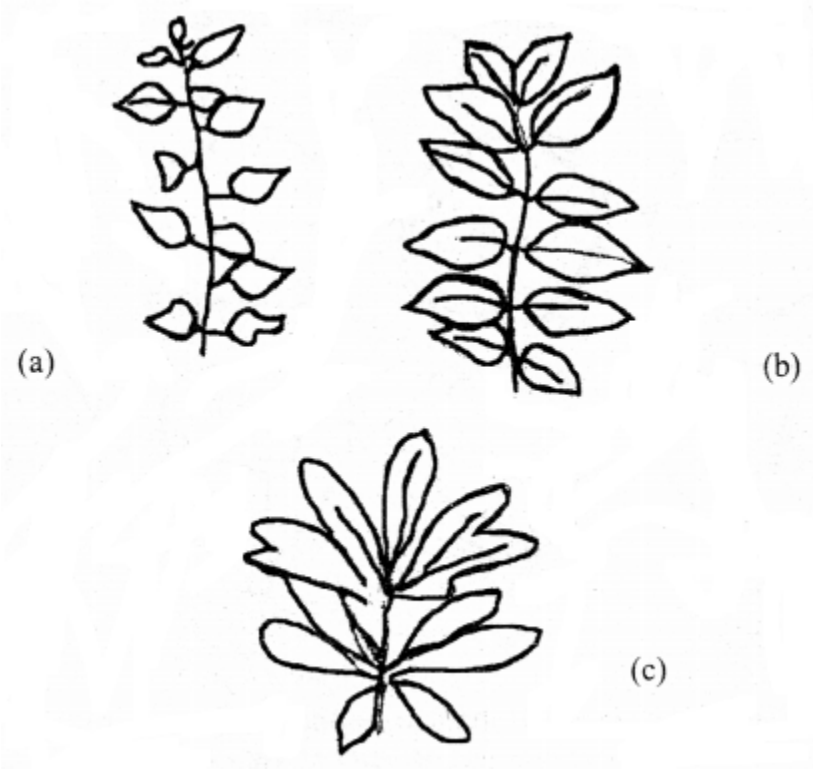
Question 9.
Write a note of different types of leaves and phyllotaxy.

Answer:
When the lamina of the leaf is entire or incised and the incisions do not touch the midrib, the leaf is said to be simple. A leaf is said to be compound when the incisions of the lamina reach up. to the midrib breaking it into a number of leaflets. In both simple and compound leaves a bud is present in the axil of the petiole. However, a bud is not present in the axil of leaflets of the compound leaf.

There are two types of compound leaves:
(a) Pinnately compound leaf
(b) Palmately compound leaf

In a pinnately compound leaf, a number of leaflets are present on a common axis, the rachis, which represents the midrib of the leaf. However in palmately compound leaves, the leaflets are attached at a common point,
i. e, the tip of the petiole.

Phyllotaxy refers to the pattern of arrangement of leaves on the stem or branch. Phyllotaxy is of three types alternate, opposite and whorled. A single leaf that arises at each node in an alternate manner is called alternate phyllotaxy, for example, as in china rose. When a pair of leaves arise at each node and lie opposite to each other it is called opposite phyllotaxy, for example in calotropis. If more than two leaves arise at a node and form a whorl it is called whorled phyllotaxy, as in Alstonia.



Different types of phyllotaxy: (a) Alternate (b) Opposite(c) Whorled

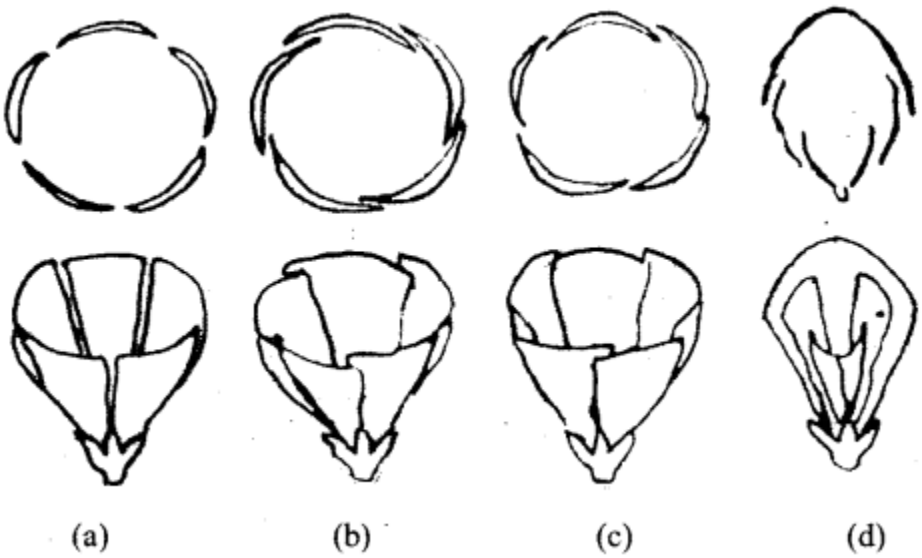
Question 10.
Write in details about a flower.

Answer:
A flower is a reproductive unit in the angiosperms. It is meant for sexual reproduction. Four different kinds of whorls are found in a flower. These are arranged successively on the swollen end of the stalk or pedicel, called the thalamus or receptacle.

These are calyx, corolla, androecium and gynoecium.
(a) Calyx: It is the outermost whorl of the flower and its members are called sepals. Mostly the sepals are green in colour, leaf-like and protect the flower in the bud stage. The calyx may be gamosepalous (in which sepals are united or polysepalous (in which sepals are free).

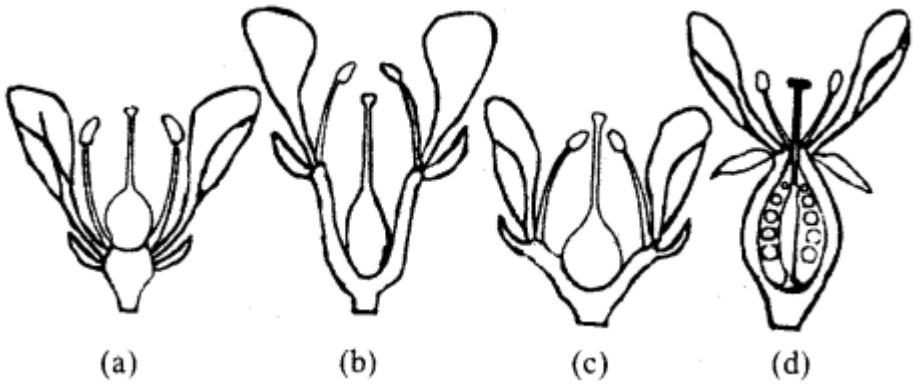
(b) Corolla: It is composed of petals that are usually brightly coloured to attract insects for pollination. The shape of the corolla may be tubular, bell-shaped, funnel-shaped or wheel-shaped.

(c) Aestivation: The pattern of arrangement of sepals or petals in the floral bud with respect to the other members of the same whorl is known as aestivation. The main types of aestivation are valvate, twisted, imbricate and vexillary.



Types of aestivation in corolla: (a) Valvate (b) Twisted (c) Imbricate (d) Vexillary

(d) Androecium: It is composed of stamens which are male reproductive organs of a flower. Each stamen consists of a stalk or a filament and an anther. Each anther is usually bilobed. There are two chambers (pollen sacs) in each lobe. The pollen grains are produced in pollen sacs.



Position of floral parts on thalamus : (a) Hypogynous (b) and (c) Perigynous (d) Epigynous

(e) Gynoecium: It is the female reproductive part of the flower. It is made up of one or more carpels. A carpel consists of three parts ovary, stigma and style. The stigma is at the tip of the style and is the receptive surface for pollen grains. The ovary is an enlarged basal part. The style connects the ovary to the stigma. Each ovary bears one or more ovules attached to a flattened, cushion-like placenta.

A flower may be trimerous tetramerous or pentamerous when the floral appendages are in multiples of 3, 4 and 5 respectively.

The flowers are described as hypogynous perigynous and epigynous based on the position of calyx, corolla and androecium in respect of the ovary on the thalamus.