Solutions

S1. Ans.(d)

Datura shows actinomorphic flower. In Cassia, *Pisum* and Sesbania, zygomorphic flowers are seen.

S2. Ans.(c)

If gynoecium is situated in the centre and other parts of the flower are located on the rim of the thalamus almost at the same level, it is called perigynous. Both diagrams shows perigynous condition.

S3. Ans.(b)

Radicle is destined to form root. In the given diagram 'C' represent radicle

S4. Ans.(d)

Rose have half-inferior ovary, thus it is known as Perigynous flower. In Pea, the placenta form a ridge along the ventral suture of the ovary and ovules are borne on this ridge forming two rows. In Cotton, twisted aestivation is present. In Mango, fruit is drupe.

S5. Ans.(d)

In China rose monoadelphous androecium is present. Diadelphous androecium is found in pea plant. Polyadelphous androecium is found in citrus. Epiphyllous androecium is found in lily.

S6. Ans.(b)

Fabaceae → Diadelphous and dithecous anther

Solanaceae → Polyandrous, epipetalous and dithecous anther.

Liliaceae → Polyandrus, epiphyllous and dithecocus anther.

S7. Ans.(a)

China rose, Tomato, Petunia and Lemon show axile placentation.

Dianthus and Primrose show free central placentation.

Pea, Lupin and Beans show marginal placentation.

Cucumber and mustard show parietal placentation.

S8. Ans.(b)

The flower is a modified shoot where in the shoot apical meristem changes to floral meristem. Internodes do not elongate and the axis gets condensed. The apex produces different kinds of floral appendages laterally at the successive nodes instead of leaves. Therefore, both A and R are true and R is correct explanation of A.

S9. Ans.(a)

When sepals or petals in a whorl just touch one another at margin, without overlapping, as in Calotropis, it is said to be valvate. Imbricate aestivation is exhibited by Cassia, Twisted aestivation is exhibited by China rose, Vexillary aestivation is exhibited by Pea.

S10. Ans.(d)

In a typical pea flower, which is a type of papilionaceous flower, the petals are arranged in a specific pattern. The single large posterior petal, often larger and more visually striking than the others, is known as the standard' or 'banner. The two lateral petals are referred to as 'wings'. The two anterior petals are usually fused at their edges and form a structure that looks like a boat's keel, which is why they are called the 'keel. So, the arrangement is 'Standard, Wings and Keel

S11. Ans.(d)

Rhizome is an underground (sub-aerial) stem. It bears distinct nodes and internodes.

S12. Ans.(a)

The sclereids are the spherical, oval or cylindrical, highly thickened dead cells with very narrow cavities (lumen). These are found commonly in the fruit wall of nuts.

S13. Ans.(c)

Imbricate aestivation is found in Cassia

Valvate aestivation is found in Calotropis

Vexillary aestivation is found in Bean

Twisted aestivation is found in cotton

S14. Ans.(c)

The floral diagram given in the question represents Brassicaceae family. It can be easily identified by looking on its parietal placentation.

S15. Ans.(c)

Axillary buds of stems get modified into woody, straight and pointed thorns. Thorns are found in many plants such as Citrus and Bougainvillea.

S16. Ans.(b)

- Vexillary aestivation and diadelphous stamens are the characteristic features of family Fabaceae.
- Pisum sativum (garden pea) belongs to family Fabaceae.
- Allium cepa (onion) and Colchicum autumnale (colchicine) belong to family Liliaceae.
- Solanum nigrum belongs to Solanaceae.

S17. Ans.(b)

When a flower can be divided into two similar halves only in one particular vertical plane, it is zygomorphic for e.g. pea, gulmohar, bean, Cassia. Mustard, Datura and Chilly show actinomorphic flowers.

S18. Ans.(c)

The given figure is of a false unit. False fruit develops from other floral parts and thalamus along with the development of ovary wall.

S19. Ans.(d)

A-(iii), B-(iv), C-(ii), D-(i)

S20. Ans.(d)

The thalamus margin develops upward in epigynous flowers, entirely enclosing and fusing with the ovary; the other parts of the flower ascend above the ovary. As a result, the ovary is considered inferior. For example- Sunflower ray florets.

S21. Ans.(d)

The primary root is replaced by a large number of roots in several monocots. The fibrous root system is made up of roots that grow from the base of the stem.

S22. Ans.(c)

The ovary lies at the centre of perigynous flowers, while the other floral elements are positioned on the

thalamus' rim. The ovary is considered to be half inferior in this case, as in plum, rose, and peach.

S23. Ans.(d)

Mustard is an example of a hypogynous flower, in which the gynoecium is at the top and the rest of the flower is below it. Such blooms are known to have superior ovary.

S24. Ans.(b)

Liliaceae The 'Lily family,' as it is more often known, is a monocotyledonous plant family.

$$Br \oplus ♀ \overset{\frown}{P_{(3+3)}A_{(3+3)}}G_{(3)}$$

S25. Ans.(d)

The fruit is known as a drupe in mango and coconut. They are one seeded and develop from monocarpellary superior ovaries. An exterior thin epicarp, a middle fleshy edible mesocarp, and an

inner stony hard endocarp distinguinsh the mango pericarp. The mesocarp of coconut, which is also a drupe, is fibrous. Endosperm is the edible component of the coconut.

S26. Ans.(c)

The ovules develop on the inner wall of the ovary or in the peripheral region of the ovary in parietal placentation. Mustard, Argemone, and so on.

S27. Ans.(a)

Halophytes are found in high-salinity environments such as mangrove swamps, marshes, and sloughs, as well as along seashores. To compensate for the absence of soil aeration, halophytes grow pneumatophores, a form of negatively geotropic root (breathing roots).

S28. Ans.(b)

Sweet potato has modified lateral or adventitious roots.

S29. Ans.(a)

These are very fine, delicate thread-like structures created by epidermal cells in the maturation region, which is located behind the elongation region. Water and minerals from the soil are absorbed by them.

S30. Ans.(a)

A drupe is a type of coconut fruit.

S31. Ans.(c)

Thorns are harsh, pointed straight constructions for protection. These are stems that have been altered.

S32. Ans.(c)

Drupe is the name given to the coconut fruit. The endosperm is represented with tender milk. The edible coconut flesh is formed as the cellular layers of endosperm are deposited along the walls as development occurs.

S33. Ans.(a)

At each node, a pair of leaves emerges and lies opposite each other. For example, Calotropis, guava, and mint.

S34. Ans.(d)

The main axis of a cymose inflorescence stops in a flower, limiting its expansion. The blooms bloom in a basipetal pattern. Flowers that are younger are found near the base, while those that are older are found at the top.

S35. Ans.(a)

Mustard has six free stamens, the inner four of which are huge and the outside two of which are little.

S36. Ans.(c)

Some epidermal cells develop root hairs, which are very tiny and delicate thread-like structures that emerge from the maturation zone. The soil's water and minerals are absorbed by these root hairs.

S37. Ans.(c)

The placentation is called free central when the ovules are borne on the central axis and the septa are missing, as in Dianthus and Primrose.

S38. Ans.(c)

Mustard (Brassica), Datura, and chilli are all actinomorphic (Radial symmetry) flowers that may be divided into two equal radial halves in any radial plane passing through the centre.

S39. Ans.(d)

Flowers of salvia, mustard, radish, and turnip have stamens of various lengths.

S40. Ans.(d)

Androecium is made up of stamens, The stamens can be grouped into a single bunch or bundle (Monoadelphous), two bundles (Diadelphous), or more than two bundles (Polyadelphous) as in the China rose, or more than two bundles (Polyadelphous) as in Citrus.

S41. Ans.(c)

Phylloclade: Stems that have been transformed into flat green organs that serve the same tasks as leaves.

Examples: Euphorbia (flattened stem) Opuntia (Cylindrical stem)

S42. Ans.(a)

Modified leaves are found on insectivorous plants such pitcher plants (Nepenthes) and Venus-fly traps.

S43. Ans.(a)

Gynoecium is tricarpellary, syncarpous, ovary superior, trilocular with multiple ovules, and axile. Placentation is present in the Liliaceae family.

S44. Ans.(c)

There are five petals, the largest of which (banner or standard or vexillum) overlaps the two lateral petals (wings), which overlap the two smallest anterior petals (keel); this is known as Vexillary aestivation.

S45. Ans.(c)

Under xerophytic adaptations, Opuntia leaves become transformed into spines to minimise transpiration.

S46. Ans.(d)

Keel is a feature of the Fabaceae family, which was previously known as papilonoideae. Gram, Arhar, Moong, Sem, Groundnut, Soyabean, Indigofera, Sun hemp, Sesbania, Trifolium, Lupin, Sweet pea, and Muliathi are examples of these plants.

S47. Ans.(b)

Perigynous means that the gynoecium is in the centre and the other parts of the flower are on the thalamus rim almost at the same level. Peach, Rose, and Plum, for example.

S48. Ans.(a)

In epigynous flowers, such as guava and cucumber blooms, and sunflower ray florets, the ovary is considered to be inferior.

S49. Ans.(a)

A flower that consists just of stamens or carpels is unisexual. Cucumber, maize, papaya, and so on.

S50. Ans.(a)

Floating roots are spongy white roots that emerge from the node stem and store air. They aid aquatic plants in maintaining their position on the water's surface.

Jussiaea and Pistia, for example.

S51. Ans.(a)

It is considered to be axile when the placenta is axial and the ovules are linked to it in a multilocular ovary.

for example- China rose, tomato, and lemon.

S52. Ans.(a)

The ovary is superior in hypogynous flowers, such as mustard, china rose, brinjal, potato, onion, and tulip.

S53. Ans.(c)

Multicarpellary apocarpous gynoecium produces aggregate fruit. For example- raspberry

S54. Ans.(d)

The aleurone layer is made up of protein found in maize grain

S55. Ans.(c)

Imbricate occurs when sepals or petals in a whorl overlap at the margin without any particular direction.

S56. Ans.(a)

Food storage causes edible subterranean stem to develop fleshy and tuberous. Potato, Ginger, Turmeric, Zaminkand, and Colocasia are just a few examples.

S57. Ans.(d)

Tomatoes have a fleshy placenta and pericarp

S58. Ans.(d)

Gynoecium is the highest-ranking hypogynous flower.

For example- Brinejal, Mustard, Tulip, Aloe, Onion, Potato, Gramme, Bean, Chilli, China rose, Lupin, Tomato, Withania somnifera, Petunia and Sun hemp.

S59. Ans.(c)

The seed coats of groundnut, gramme, and maize are thin, whereas the seed coats of coconut are thick.

S60. Ans.(b)

It is said to be actinomorphic when a flower may be divided into two equal radial halves in any radial plane passing through the centre. Twisted refers to when one appendage's margin overlaps that of the next and so on, as in China rose, lady's finger, and cotton.