30. **(b)** Mollusca is normally oviparous and its development may be direct or indirect. If development is indirect then it occurs through trochophore or veliger larva. Echinoderms show bilateral symmetry in larvae but pentamerous radial symmetry adult. Fertilization is external. In arthopods, body is divided into head, thorax and abdomen. Respiratory organs consists of book gills, book lungs and tracheae. Notochord is present in chordates at some stage of their lives. Urinary and anal openings, may or may not be separate.

31. **(b)** In reptiles, fertilization is internal and development is direct.

32. **(d)** The body cavity of coelomates develops from the mesoderm and contains a peritoneum. The acoelomates lack a body cavity.

33. **(b)** Because they are not structurally robust, heavy wave action would destroy large, upright sponges.

34. **(c)** The Ctenophora have evolved a complete gut with a mouth and two anal pores.

35. **(c)** There are no eyes but photoreceptors do occur on prostomium and dorsal epidermis. They have been, of course, called "ocelli of earthworm".

36. **(b)** The phylum Rotifera are pseudocoelomates and have a pseudocoel.

37. **(a)** The segmentation of the annelids allows for more complex coordinated movement.

38. **(c)** Similar body halves could be obtained with either radial or biradial symmetry. Spherical symmetry has no main body axis along which to cut, and bilateral symmetry produces mirror-image halves.

39. **(d)** Bilateral animals tend to move through the environment. cephalization is important in the control and coordination of this locomotion.

40. **(b)** Olfactory chemoreceptors means olfactoreceptors.

41. **(d)** Corals and sea anemones are members of the cnidarian class Anthozoa.

42. **(d)** Nematocysts, the stinging cells found in cnidocytes, are the only item in this list that the cnidarians possess exclusively.

43. **(d)** Flatworms are bilaterally symmetrical and triploblastic animals.

44. **(d)** A garden snail possesses all of these structures.

45. **(a)** Medusa and polyp are two types of body shapes of Cnidaria, which includes jellyfish, sea anemones, corals and hydrozoans. Medusa has an umbrella shape. Polyp is umbrella in shape also but inverted. Both medusae and polyps have gastrovascular cavities, tentacles and a mouth. Spongin is a protein found in the inside layer of a sponge. it helps in its structural support.

Speed Test-63

1. **(d)** The fruit is a mature or ripened ovary. When a fruit develops exclusively from the ovary, it is said to be true fruit. When in addition to the ovary, some other floral part also participates in the formation of fruits, then it is known as false fruit. Apple, pear, cashewnut, mulberry etc. are all false fruits.

2. **(a)**

3. **(a)** Single cotyledon of embryo in cereal grain is represented by scutellum. Coleoptile represents the covering of stem. Coleorrhiza represents the covering of root.

4. **(d)** Desert plants have well developed root system so that they can absorb water from the deeper layers of soil. They have sunken stomata and reduced leaves which reduce the rate of water loss through transpiration.

5. **(a)**

6. **(d)** Insectivorous plants grown in nitrogen deficient soil. Therefore, these plants capture insects and have the ability to digest them (their protein). Since proteins are made up of amino acids, having nitrogen in their structure (amino group), these plants overcome the deficiency of nitrogen which is essential for their growth.

7. **(b)** **8.** **(b)** **9.** **(d)** **10.** **(d)** **11.** **(d)**

12. **(c)** **13.** **(a)**

14. **(c)** In *Cocos nucifera* (coconut) milky endosperm is found in which many nuclei, vitamins and growth hormone e.g., cytokinins, auxin and induced cytokinin is found.

15. **(a)** **16.** **(d)** **17.** **(c)** **18.** **(a)**

19. **(a)** Epigynous flower ⇒ $\underline{\overline{G}}$ e.g. Cucumber
Perigynous flower ⇒ G – e.g. Rose and plum
Hypogynous flower ⇒ $\underline{G}$ e.g. Brinjal

20. **(c)**

21. (b) Caryopsis is a small, indehiscent, one seeded fruit developing from a monocarpellary ovary in which the pericarp is fused with the seed coat. The seed completely fills the chamber, e.g., wheat, maize.

22. **(c)** Polyarch condition

23. **(a)**

24. **(c)** Opuntia has phylloclade for food synthesis.

25. **(a)** Sub-aerial stem

26. **(c)** Inferior ovary

27. **(c)** Drupe is the fruit type in mango & coconut.

28. **(c)** When stamens are attached to the perianth, they are known as epiphyllous, e.g., Asparagus, lily.

29. **(b)** In perigynous condition of a flower, the gynoecium is situated in the centre and other floral parts are located on the rim of the thalamus almost at the same level. Ovary is said to be half-inferior, e.g., *Rosa* (Flask-shaped thalamus), *Prunus* (Cup-shaped thalamus).

30. **(a)** The given floral diagram is of family Solanaceae (potato family). Its flower is bisexual and actinomorphic, abracteate or bracteate, pentamerous, cyclic. Calyx 5, gamosepalous, persistent. Corolla 5, gamopetalous, often plicate in bud. Androecium 5, polyandrous and epipetalous. Gynoecium bicarpellary and syncarpous. Ovary superior, placed obliquely, placentation axile with swollen-placenta. Fruit is berry or capsule.

31. **(c)** Liliaceae (Lily family) and Poaceae (= Gramineae, gross family) are the two monocot families.

32. **(b)** In *Nepenthes*, the pitchers are meant for catching and digesting insects. The lamina is modified into pitcher. The leaf apex gives rise to a coloured lid for attracting the insects.

33. **(a)** In Dahlia, roots do not originate from radicles and are therefore, adventitious. These roots are fleshy having no definite shape, i.e. tuberous in nature. The tuberous roots occur in group or fascicle and are also called fasciculated. Roots of radish, carrot and beet that originate from radicle are the examples of modified tap root.

34. **(d)** The main function of root-cap is to protect the growing apex from soil particles. Plant growing in water (hydrophytes) or on another plant (epiphytes) or in another plant (parasites) are devoid of root-cap.

35. **(d)** The coralloid root of *Cycas* and pneuamatophores of mangroves (like *Rhizophora*) become negatively geotropic i.e., come above the soil surface, due to bacterial infection and for aeration, respectively.

36. **(b)** *Santalum album* (Sandal wood plant) is a small tree, but at the young stage remains as a parasite on the roots of other plants.

37. (b) For storage, tap roots are modified into four ways i. e., napiform, fusiform, conical and tuberous. In the latter form there is no definite shape, as found in *Mirabilis*. A point to note that tuberous root may develop either from tap root or from adventitious root.
38. (c)
39. (b) In many monocots, the stem is represented by underground modifications. However, the flowers are developed on a axis called scape or pseudostem. Such type of development is found in onion, aroids, banana etc.
40. (a) Sweet potato represents the adventitious modified root of *Ipomoea* plant.
41. (c) Epiphyllous bud is a type of adventitious bud, i.e, not originating from stem apex or axil of a leaf. Usually it develops from margin (or leaf surface) of leaf as in *Bryophytlum, Kalanchoe etc.* It serves the function of vegetative propagation.
42. (d) Tuber is a modified stem. A stem can not be developed on root. In potato plant, tubers develop on a special branch of the stem called stolon.
43. (b) 44. (b)
45. (b) Like phylloclade, cladode is also a modification of stem. But here the branch or axillary bud is only modified into a flat, tree like structure with only one internode.

Speed Test-64

1. (b)
2. (d) Function of companion cell is to load sugar and amino acids into sieve elements. These cells use transmembrane proteins to take up by active transport.
3. (c) Phellem, phellogen and phelloderm are collectively called periderm.
4. (d) Submerged hydrophytes do not have stomata (a protective mechanism in aquatic plants against water logging of internal cells and tissues).
5. (d) Tracheids are chief water conducting elements of xylem in gymnosperms. They are devoid of protoplasm and hence dead. The wall constituting the tracheids is hard, thick and lignified. These are elongated cells with tapering ends.
6. (d)
7. (b) Vascular cambium is produced by two types of meristems, fascicular and interfascicular cambium.
8. (d) Vessels are elongated, multicellular water conducting channels with wide lumen formed by end to end fusion of a large number of vessel elements. Tracheids are elongated dead cells with tapering ends having lignified walls with large or wide lumen. Their main function is conduction of water and minerals from root to leaf.
9. (c) The concept of quiescent centre was proposed by Clowes in 1961. On the basis of autoradiographic studies of DNA synthesis in the root tip of *Zea*, he found a reservoir of cells having low DNA, RNA and protein concentration. They may or may not divide. It is resistant to damages.
10. (d) 11. (b)
12. (b) The common bottle cork is the product of phellogen. Phellogen produces cork or phellem on the outer side. It consists of dead and compactly arranged rectangular cells that possess suberised cells walls. The cork cells contain tannins. Hence, they appear brown or dark brown in colour. The cork cells of some plants are filled with air *e.g.*, *Quercus suber* (Cork Oak or Bottle Cork).
13. (b)
14. (d) In submerged hydrophytes, whole plant body remains under water. *e.g. Ceratophyllum* and *Utricularia*. In these plants, stomata is absent and gaseous exchange takes place through general body surface.
15. (d) In collenchyma cell walls show localized thickenings due to presence of approximately 45% pectin, 35% hemicellulose and 20% cellulose.
16. (c) Being a xerophytic plant, *Nerium* bears multiple epidermis to cut the rate of transpiration.
17. (a)
18. (a) Secondary wall situated near the plasma membrane after the formation of primary wall.
19. (d) 20. (a) 21. (d) 22. (d)
23. (a) Based on position of protoxylem in relation to metaxylem, the xylem may be exach/centripetal, endarch/centrifugal, mesarch and centerarch. In endarch condition, protoxylem lies on the inner side of metaxylem e.g., dicot and monocot stems.
24. (a) A monocot stem lacks secondary growth. The vascular bundles are oval or rounded in outline. They contain both phloem and xylem. Phloem lies towards the outside and the xylem on the inner side. Cambium is absent as the whole procambium is consumed in the formation of vascular tissues. Xylem is in the form of the letter Y. It is endarch, i.e., protoxylem lies towards the centre of the stem. Xylem is made up of vessels, tracheids, xylem parenchyma and a few xylem fibres. Metaxylem generally consists of two large oval of rounded vessels lying at the upper two angles of xylem. Protoxylem cavity is present at the end of protoxylem vessels.
25. (d) Heart wood (duramen) is the central wood of an old stem. It is dark coloured. Living cells are absent. Heart wood is the part of secondary xylem. The tracheary elements are plugged by tyloses. Tracheary elements have deposition of tannins, resins, gums, etc. Heart wood is heavier. It is more durable due to its little susceptibility to the attack of pathogens and insects. Heart wood is mechanical in function. The outer or peripheral portion of the trunk is lighter in colour and soft which performs the functions of conduction of water and minerals and it is known as sap wood or alburnum.
26. (d) Intercalated between mature tissues, it helps in regeneration.
27. (d) Spring wood or earlywood
28. (a) Shoot apical meristem
29. (c) Companion cells control activities of sieve tube.
30. (c)
31. (d) Internal (physiological) and external (environmental) factors.
32. (d)
33. (d) Meristematic zone
34. (b) Thickening of wall is due to deposition of cellulose, hemicellulose and pectin.
35. (b) Endodermis with casparian strips is found in dicot stem.
36. (d)
37. (d) The electron microscope revealed al the structural details of the cell.
38. (c)
39. (d) Important functions of veins are : (i) Conduction of water through xylem; (ii) Providing channels for translocation of organic nutrients; (iii) Conduction of minerals; (iv) By their large number, the veins and veinlets provide skeletal support to the lamina so that it can remain stretched for its optimum functioning; (v) Veins and veinlets reduce the effect of wilting.
40. (b) *Cuscuta* is a total parasite so it absorbs the prepared food from the phloem of the host, hence haustoria reaches upto phloem of host.
41. (c) Tylose is a balloon-like outgrowth of paratracheal parenchyma into a pit in the wall of a vessel or tracheid and a xylem parenchyma cell lying next to it. This xylem parenchyma occurs at the edge of annual ring around the vessels.