Solution

BIOLOGICAL CLASSIFICATION AND PLANT KINGDOM WS

Class 11 - Biology

1. **(b)** By producing spores
Explanation: Bacteria reproduce mainly by fission. Sometimes, under unfavourable conditions, they produce spores. They also reproduce by a sort of sexual reproduction by adopting a primitive type of DNA transfer from one bacterium to the other.

2. **(b)** Having cell wall and chloroplast
Explanation: The plant cells have a eukaryotic structure with prominent chloroplasts and cell walls mainly made of cellulose.

3. **(c)** Endospore
Explanation: A bacterium capable of tolerating extreme heat, dryness, and toxic chemicals have the ability to produce endospores inside the body that help them to tide over unfavorable conditions.

4. **(b)** Algal Virus - Mycophages
Explanation: Mycophages are not a group of bacteria. They are a group of organisms that use algae as food. The animal virus is called Zoophagineae, plant virus phytophagineae, and the bacterial virus is called bacteriophages.

5. **(d)** Capsid
Explanation: A capsid is the protein shell of a virus. It consists of several oligomeric structural subunits made of a protein called protomers. The capsid encloses the genetic material of the virus.

6. **(c)** Mycelium
Explanation: The body of the filamentous fungus is known as mycelium, which is a thread-like structure. Mycelium produces hyphae and sporogenous cells to produce spores.

7. **(b)** Basidiomycetes
Explanation: Commonly known forms of basidiomycetes are mushrooms, bracket fungi, or puffballs.

8. **(a)** RNA
Explanation: The virus in which genetic material is RNA is called a retrovirus. In this virus reverse transcription takes place to form DNA that synthesis proteins.

9. **(b)** Dikaryon
Explanation: In fungi like ascomycetes and basidiomycetes, an intervening dikaryotic stage (n + n i.e. two nuclei per cell) occurs; such a condition is called a dikaryon and the phase is called dikaryon phase of fungus.

10. **(c)** Fungi
Explanation: Fungi is important in the nutrient cycle and acts as decomposer along with bacteria and mineralizers of the biosphere to regular recycling of nutrients in the biosphere.

11. **(a)** Chemosynthetic autotrophic bacteria
Explanation: Chemosynthetic autotrophic bacteria oxidize various inorganic substances such as nitrates, nitrites, and ammonia and use the released energy for their ATP production. They play a great role in recycling nutrients like nitrogen, phosphorous, iron, and sulphur.

12. **(b)** Lichens
Explanation: Lichens can be used as air pollution indicators, especially of the concentration of sulfur dioxide in the atmosphere. Lichens are plants that grow in exposed places such as rocks or tree bark.

13. **(a)** Mycelium
Explanation: Mycelium is the vegetative part of a fungus or fungus-like bacterial colony, consisting of a mass of branching, thread-like hyphae.

14. **(b)** Protista
Explanation: Monera contains all prokaryotic organisms and bacteria. Fungi can have unicellular as well as multicellular organisms that comes under the Protista.

15. **(a)** Symbiosis
Explanation: Symbiosis in lichens is the mutually helpful symbiotic relationship of green algae and/or blue-green algae (cyanobacteria) living among filaments of a fungus. The fungus benefits from the algae or cyanobacteria because they produce food by photosynthesis.

16. **(a)** Drosera
Explanation: Drosera plant is partially heterotrophic. These plants capture insects to fulfil its protein requirement although it performs photosynthesis also.

17. **(d)** Mesosome
Explanation: Bacteria belong to the kingdom Monera in which organisms are unicellular and prokaryotic. Prokaryotic organisms lack membrane-bounded organelles like mitochondria where respiration occurs. In bacteria, respiration occurs in the mesosome.

18. **(c)** All of these
Explanation: Phycomycetes belong to fungi. They live in aquatic habitats, moist and damp places, as obligate parasites on plants and on decaying wood.

19. **(a)** Aristotle
Explanation: Over 2000 years ago, a Greek scientist named Aristotle was one of the first people to classify living things. He noticed that living things fit into two main groups: green and did move. Aristotle next divided all animals into three groups. He based his groups on where the animals lived.

20. **(b)** Polymyelitis virus
Explanation: A virus consists of genetic material (DNA or RNA) surrounded by protein capsules. They are of different shapes and sizes. The poliomyelitis virus is cubical in shape.

21. **(d)** Zoospores
Explanation: In fungi, the asexual reproduction takes place by spores called conidia or sporangiospores or zoospores, and sexual reproduction is by oospores, ascospores and basidiospores.

22. **(a)** Downy mildew
Explanation: Downy mildew disease is caused due to fungus that forms cottony growth on the surface of the host. The leaves' surface gets reduced that alters the photosynthesis rate.

23. **(b)** Enaima and Anaima
Explanation: Haemoglobin in RBCs imparts red colour to it. The organisms whose blood contains haemoglobin are called enaima and those without it are called anaima.

24. **(b)** Bacteriophage
Explanation: A bacteriophage is a virus that infects and replicates within a bacterium.

25. **(c)** Protonema
Explanation: The spore of moss germinates to produce protonema. It is a creeping, green, branched, and frequently filamentous stage, which develops into secondary protonema as a lateral bud. This stage bears sex organs.

26.

(b) Haploid and is found in mosses

Explanation: A protenemal stage is a juvenile or tentative stage in the life history of mosses. They are haploid in nature. It arises after the germination of spore. It is short-lived.

27.

(c) Lichen

Explanation: Lichens contain colorful dyes that can be extracted and used in litmus solution.

28.

(b) Sporophylls

Explanation: The sporophytes bear sporangia that are subtended by leaf-like appendages called sporophylls.

29.

(c) Lower part of capsule

Explanation: The sporophyte of moss is differentiated into three parts - foot, seta, and capsule. The capsule, in turn, is differentiated into 3 regions.

i. Apophysis - the sterile basal portion of the capsule, it is in continuity with seta
ii. Theca or body of capsule, which is the fertile region, and
iii. Operculum the apical region of capsule.

Apophysis is rich in chloroplast and thus the photosynthetic region of moss, it also provides nutrition to the developing sporangium.

30. **(a)** Haploid

Explanation: The main plant body of the bryophyte is haploid. It produces gametes, hence is called a gametophyte.

31. **(a)** Equisetum

Explanation: Equisetum of Pteridophyta belongs to class Sphenopsida.

32.

(c) Ovule

Explanation: The cones bearing megasporophylls with ovules or megasporangia are called macrosporangiate or female strobili.

33.

(d) Archegonia

Explanation: Pteridophytes and Gymnosperms belong to a different division of plant kingdom but both of them possess Archegonia as female sex organ which produces female gamete for sexual reproduction.

34. **(a)** Pinus

Explanation: Roots in some genera of gymnosperms have a fungal association in the form of mycorrhizal (Pinus).

35. **(a)** Prothallus

Explanation: Fern spores germinate to give rise to inconspicuous, small but multicellular, free-living, mostly photosynthetic thalloid gametophytes called prothallus. The gametophytes bear male and female sex organs called antheridia and archegonia.

36.

(d) Bryophyta

Explanation: The lichen and mosses play an important role in soil formation.both are slow but efficient soil formers. The lichens, however, are the pioneers to colonize barren, bare rocky surfaces where no other plants can grow. The lichen thalli secrete organic acids which gradually dissolve and disintegrate the rocks to which they cling. The rocks particle together with the dead and decaying the older part of the lichen thalli from fertile soil. Mosses make their appearance when a sufficient amount of this fertile soil gathers in the crevices of the rock's surface.

37.

(b) Reproductive organs

Explanation: In gymnosperms, male and female cones are formed that produce male and female gametes. The strobilus bearing microsporophylls and microsporangia are called microsporangia or male strobilus. The cones bearing megasporophylls with ovules or megasporangia are called microsporangia or female strobilus. So, the cone of gymnosperms represents the reproductive organs.

38.

(d) Haploid

Explanation: A dominant, independent, photosynthetic, thalloid, or erect phase of Bryophytes and pteridophytes is represented by a haploid gametophyte.

39. **(a)** Gymnosperms

Explanation: Gymnosperms have reproductive structure as cones i.e. Male and female.

40.

(d) Gymnosperm

Explanation: The different types of organisms classified as cryptogams and wherein our four kingdoms:

- **Kingdom Eubacteria:** Cyanobacteria (previously called blue-green algae).
- **Kingdom Protista:** Slime molds, green algae, other algal groups.
- **Kingdom Fungi:** Basidiomycota mushrooms and their close relatives, Ascomycota cup fungi and their close relatives, and lichen.
- **Kingdom Plantae:** Bryophytes (mosses, liverworts, and hornworts) and vascular cryptogams (ferns, horsetails, and club mosses).

41.

(c) A gametophyte free-living structure formed in pteridophytes.

Explanation: A gametophyte free-living structure formed in pteridophytes which is of short duration.

42.

(b) Leaf apex

Explanation: In sexual reproduction, the sex organs antheridia and archegonia are produced at the apex of the leafy shoots.

43.

(c) Gametophyte and Capsule

Explanation: Gametophytes and capsule are diploid structure and alternate with a haploid structure called spores by reduction division.

44. **(a)** Naked seeds

Explanation: The gymnosperms (Gymnos: naked, Sperma: seeds) are plants in which the ovules are not enclosed by any ovary wall and remain exposed, both before and after fertilization. The seeds that develop post-fertilization, are not covered, i.e., are naked. Since Cycas has naked seeds, it belongs to gymnosperms.

45.

(b) Ginkgo

Explanation: Ginkgo is a living fossil. This plant belongs to the gymnosperms division. It is considered as one of the oldest plants known and still surviving in some parts of the world.

46. **(a)** Cycas

Explanation: Cycas produces top-shaped multinucleate male gametes and mature seeds with one embryo having two cotyledons. Although, male and female gametes are generally uninucleate in gymnosperms.

47.

(d) Cryptogams

Explanation: The cryptogams are flowerless and seedless plants. They are simple plants like algae, mosses, and ferns which do not produce flowers, fruits, and seeds. Cryptogams are considered as lower plants.

48.

(b) Sphagnum

Explanation: Sphagnum is also known as peat moss as it provides peat that has long been used as fuel.

49. **(a)** Independent and dominant sporophyte

Explanation: In bryophytes, the dominant phase in the life cycle is the gametophytic plant body. However, in pteridophytes, the main plant body is a sporophyte which is differentiated into true root, stem and leaves.

50.

(b) Sori

Explanation: The yellow or brown spots which have sporangia in fern are called sori. Spores are produced inside these sporangia to produce haploid gametophyte.

51.

(d) Mosses

Explanation: The bryophytes are divided into liverworts and mosses so they are closely related to each other.

52.

(b) Epiphytes

Explanation: Epiphytes are dependent on other large plants for space or physical support. It remains to attach with other plants but does not obtain food or another nutrient from it so they are not parasitic on the supporting plants.

53.

(c) Algae

Explanation: Algae are chlorophyll-bearing, simple, thalloid, autotrophic plants with the simplest body organization. Their body is thallus like without true root, stem, and leaf differentiation.

54. **(a)** Holdfast

Explanation: Angiosperms plants have roots to hold the soil and remain erect. Similarly, Rhodophytes have holdfast by which they remain attached with substratum to absorb water and minerals.

55. **(a)** Algae

Explanation: Spirulina is a blue-green alga and It is one of the most potent nutrient sources of vitamins B-1(thiamine), B-2 (riboflavin), B-3(nicotinamide), B-6 (pyridoxine), B-9 (folic acid, vitamin C, vitamin D, vitamin A, and vitamin E. It is also a source of potassium, calcium, chromium, copper, iron, magnesium, manganese, phosphorus, selenium, sodium and zinc.

56. **(a)** Water

Explanation: Most of the algae are aquatic, can be freshwater algae - Chlorophyceae or marine algae - Phaeophyceae and Rhodophyceae.

57.

(c) Bryophytes

Explanation: Bryophytes are also called amphibians of the plant kingdom because these plants can live in soil but are dependent on water for sexual reproduction.

58.

(b) Pinus

Explanation: Pinus belongs to division gymnosperms. In gymnosperms, seeds are formed but not inside the fruit. They are also called as plants with naked seeds.

59.

(c) Bryophytes

Explanation: Bryophytes are called amphibians of the plant kingdom as they can grow in both land and water. Water is essential for the completion of the life cycle as they release antherozoids into the water where they come in contact with archegonium to produce a zygote.

60.

(d) Gymnosperm

Explanation: Gymnosperm. It is the sole living species of genus Sequoia. Its common name includes redwood, California redwood. It is an evergreen, long-living monoecious tree.

61.

(d) Oogamous

Explanation: Oogamy is a form of anisogamy (heterogamy) in which the female gamete (e.g. egg cell) is significantly larger than the male gamete and is non-motile.

62.

(b) Ovule

Explanation: Megasporangium of seed plants is called an ovule. The ovule is present inside the ovary which becomes seed on maturation after fertilization. It produces megasporocytes or Megaspore mother cells that yield megaspores.

63.

(d) Salvinia

Explanation: Genera like Selaginella and Salvinia which produce two kinds of spores, macro (large) and micro (small) spores are known as heterosporous.

64. **(a)** Phaeophyceae
Explanation: The plant body of Phaeophyceae is attached to root-like holdfast, the stalk which is similar to stipe and frond which is similar to leaves.

65. **(d)** Wind
Explanation: In Gymnosperms, cross-pollination is mainly accompanied by wind. The pollen grains are produced in large quantities and generally lighter.

66. **(d)** Monera
Explanation: Cyanobacteria are classified under the kingdom Monera because they are unicellular with prokaryotic cells.

67. **(a)** Sequoia
Explanation: One of the gymnosperms, Giant sequoias are the world's largest single tree with an average height of 50 - 85 m (164 - 279 ft) and 6 - 8 m (20 - 26 ft) in diameter.

68. **(a)** Cedrus
Explanation: Unlike bryophytes and pteridophytes, in gymnosperms (Cedrus) the male and the female gametophytes do not have an independent free-living existence.

69. **(a)** (a)-iii, (b) - iv, (c) - ii, (d)- i
Explanation: (a)-iii, (b) - iv, (c) - ii, (d)- i

70. **(d)** Cycas
Explanation: The sperms of male gamete of Cycas are the largest in the biological world. It is top-shaped. In *Cycas revoluta* the size of the sperm ranges between 180 to 210 μm and they are clearly visible to the naked eye.

71. **(d)** Chlamydomonas
Explanation: The algae present in the figure is Chlamydomonas which is a unicellular algae present in fresh water. Two flagella is attached to it that helps in the movement in water.

72. **(c)** Cycas
Explanation: The plant shown in the figure is cycas that belongs to division Cycadophyta and family Cycadaceae. It is dioecious and Cycas circinalis species is endemic to India.

73. **(a)** Selaginella
Explanation: Selaginella belongs to class Lycopsida and other plants (Dryopteris, Pteris, Adiantum) belong to class Pteropsida of Pteridophytes.

74. **(d)** The algal component will survive while the fungal component will die.
Explanation: The algal component will survive while the fungal component will die. This symbiosis is more in the favour of fungal partner than the algal partner and is also termed as helotism, i.e., master and slave relationship where the fungus is the master and alga is a slave. When living together, both are benefitted from each other. The algal component does photosynthesis and provides food and fungal component anchors water which is an important raw material for photosynthesis.