

M.SC. ENTRANCE QUESTIONS
SUBJECT: BOTANY

1. Which one of the following heterotrichous algae grows on rocks or bark?

1. Stigeoclonium
2. Trentepohlia
3. Cephaleuros
4. Fritschiella

Correct Answer:

Trentepohlia

2. Which one of the following statements is NOT correct?

1. Roots are absent in Psilotum.
2. In Equisetum, spores are spirally wrapped with elaters.
3. In Selaginella, rhizophores arise from angle meristems located at shoot branch points and produce roots at their distal ends.
4. Telome theory describes the classification of ferns.

Correct Answer:

Telome theory describes the classification of ferns.

3. Which one of the following features of Anthoceros indicates its algal ancestry?

1. Single chloroplast with a pyrenoid in each cell
2. Symbiotic association with Nostoc
3. Presence of slime pores
4. Presence of stomata in the capsule wall

Correct Answer:

Single chloroplast with a pyrenoid in each cell

4. Which one of the following plants has anisocytic type of stomata?

1. Dianthus caryophyllus
2. Triticum aestivum
3. Arabidopsis thaliana
4. Allium cepa

Correct Answer:

Arabidopsis thaliana

5. The culturing of plant cells in liquid agitated medium is called

1. hydroponics
2. aquaponics
3. micropropagation
4. suspension culture

Correct Answer:

suspension culture

6. Sympatric species are those that

1. flower at the same time of year.
2. have nearly identical life spans.
3. occupy the same ecological niche.
4. occupy the same geographic region.

Correct Answer:

occupy the same geographic region

7. An erect, leafless stem bearing an inflorescence or flower at its apex is called

1. scape
2. acaulescent
3. caulescent
4. cauliflorous

Correct Answer:

Scape

8. Plants adapted to low light intensity generally have

1. extended root system.
2. CAM pathway of photosynthesis.
3. higher photosynthetic rate.
4. leaves modified to spines.

Correct Answer:

higher photosynthetic rate

9. Hormogonia are

1. multicellular fragments of filaments which serve in vegetative reproduction of some blue-green algae.
2. multicellular fragments of filaments which serve in vegetative reproduction of some green algae.
3. a chain of spherical cells with thickened walls which serve in vegetative reproduction of some blue-green algae.
4. a chain of spherical cells with thickened walls which serve in vegetative reproduction of some green algae.

Correct Answer:

multicellular fragments of filaments which serve in vegetative reproduction of some blue-green algae

10. In gametophytic self-incompatibility (GSI) system

1. outcome of the interaction is determined by the genotype of pollen producing parent.
2. pollen grains are three-celled.
3. S-locus products are synthesized after completion of meiosis.
4. growth of the pollen tube is arrested in the stigmatic zone.

Correct Answer:

S-locus products are synthesized after completion of meiosis

11. Photoperiodism was discovered by

1. Dutrochet and Overbeek
2. Bose and Blackman
3. Went and Paal
4. Garner and Allard

Correct Answer:

Garner and Allard

12. The bacterial DNA replication initiator protein is:

1. OriC
2. DnaB
3. dnaG
4. dnaA

Correct Answer:

dnaA

13. In Gymnosperms, the female gametophyte develops from the

1. Nucellus cells
2. Haploid megaspore mother cell
3. Haploid megaspore
4. Diploid megaspore

Correct Answer:

Haploid megaspore

14. Autotetraploids are often marked by the presence of

1. univalents at Meiosis 1.
2. multivalents at Meiosis 1.
3. bridge at Meiosis 1.
4. bivalents at Meiosis 1.

Correct Answer:

multivalents at Meiosis 1

15. Phytochrome protein is a

1. monomer
2. homodimer
3. heterodimer
4. tetramer

Correct Answer:

Homodimer

16. In bacteria, the membrane invaginations that initiate DNA replication are

1. Nucleosomes
2. Mesosomes
3. Magnetosomes

4. Carboxysomes

Correct Answer:

Mesosomes

17. Nuclear endosperm formation is characterized by

1. Nuclear divisions accompanied by cell wall formation
2. Primary endosperm nucleus dividing to form a larger micropylar chamber and a smaller chalazal chamber
3. Autonomous development of endosperm without fertilization
4. Free nuclear divisions not accompanied by cell wall formation

Correct Answer:

Free nuclear divisions not accompanied by cell wall formation

18. The enzyme responsible for the reduction of nitrogen into ammonia during biological nitrogen fixation is

1. Nitrogenase
2. Nitrate reductase
3. Dinitrogenase
4. Hydrogenase

Correct Answer:

Nitrogenase

19. In bryophytes, meiosis occurs in the

1. sporogenous tissue to produce spores
2. gametangia to produce sperm and egg
3. gametophyte to produce gametangia
4. spores to produce protonema

Correct Answer:

sporogenous tissue to produce spores

20. In Gnetum,

1. archegonia remain in a group surrounded by a common jacket.
2. nuclei of some nucellar cells function as eggs.
3. there are no distinct archegonia and some free nuclei of female gametophyte function as eggs.
4. there are two distinct archegonia at the micropylar end of the female gametophyte.

Correct Answer:

there are no distinct archegonia and some free nuclei of female gametophyte function as eggs.

21. In Polygonum type of embryo sac, which of the following is attached to the wall of the embryo sac, only at the micropylar end.

1. Central cell
2. Antipodal cells
3. Egg cell

4. Egg apparatus

Correct Answer:

Egg apparatus

22. In competitive inhibition, an inhibitor

1. binds covalently to the enzyme.
2. binds at several sites on an enzyme.
3. binds reversibly at the active site.
4. binds only to the enzyme-substrate complex.

Correct Answer:

binds reversibly at the active site

23. Dikaryotic hyphae are found in

1. Chytridiomycota

2. Zygomycota

3. Basidiomycota

4. Ascomycota

1. 2 and 4 only
2. 1, 2 and 3 only
3. 1, 2 and 4 only
4. 3 and 4 only

Correct Answer:

3 and 4 only

24. The inhibitory effect of red light on flowering during critical dark period on short day plants can be overcome by

1. infra-red light
2. far-red light
3. blue light
4. UV light

Correct Answer:

far-red light

25. During meiosis 1, formation of a ring involving four chromosomes is often an indication of

1. paracentric inversion
2. deletion
3. tetraploidy
4. reciprocal translocation

Correct Answer:

reciprocal translocation

26. Binary fission in bacteria involves all of the following except

1. DNA duplication
2. Spindle formation
3. Cell elongation
4. cytokinesis

Correct Answer:

Spindle formation

27. Passage cells are thin-walled cells

1. in testa of seeds to enable emergence of growing embryonic axis during seed germination.
2. in epidermis of roots and help in apoplast pathway.
3. in endodermis of roots facilitating rapid transport of water from cortex to pericycle.
4. in phloem elements and serve as entry for nutrients to be transported to other plant parts.

Correct Answer:

in endodermis of roots facilitating rapid transport of water from cortex to pericycle

28. Nitrifying bacteria, sulfur-oxidizing bacteria and Methanogens are examples of

1. Photolithotrophs
2. Chemolithotrophs
3. Phototrophs
4. Photo-organotrophs

Correct Answer:

Chemolithotrophs

29. The major component of the edible part of cereal grains is

1. Endosperm
2. Cotyledon
3. Perisperm
4. Seed coat

Correct Answer:

Endosperm

30. Which of the following is NOT involved in photorespiration?

1. Mitochondria
2. Rubisco
3. Peroxisome
4. PEP carboxylase

Correct Answer:

PEP carboxylase

31. Which one of the following is NOT associated with anomalous secondary growth in stems?

1. Intraxylary secondary phloem.
2. Medullary rays.

3. Accessory cambia.
4. Rhytidome.

Correct Answer:

Rhytidome.

32. Which one of the following statements is NOT true?

1. Triacylglycerols are the major lipids stored in seeds.
2. Complete oxidation of 1 gm lipid would produce more energy than oxidation of 1 gm of carbohydrate.
3. Lipids are a more reduced form of carbon than carbohydrates.
4. Waxes are not lipids.

Correct Answer:

Waxes are not lipids

33. Which one of the following statements is NOT true?

1. Starch synthesis is related to Calvin Cycle.
2. Starch is a soluble carbohydrate reserve.
3. Starch is synthesized from triose phosphate.
4. Starch is synthesized in the chloroplast.

Correct Answer:

Starch is a soluble carbohydrate reserve

34. Which one of the following statements about phellogen is correct?

1. Following a periclinal division in a parenchyma cell, the larger of the two daughter cells becomes a phellogen while the smaller differentiates into a phelloderm cell.
2. Phellogen initials arise through dedifferentiation of parenchyma cells.
3. Phellogen produces smaller quantities of phellem cells than phelloderm cells.
4. Phellem is formed to the interior of phellogen.

Correct Answer:

Phellogen initials arise through dedifferentiation of parenchyma cells

35. Which one of the following features is NOT found in leaves having Kranz anatomy?

1. Dimorphic chloroplasts.
2. Bundle sheath cells arranged in a wreath-like manner.
3. Bundle sheath cells lacking chloroplasts.
4. Vascular bundles surrounded by two layers of cells.

Correct Answer:

Bundle sheath cells lacking chloroplasts

36. Competitive inhibitors and uncompetitive inhibitors

1. increase and decrease apparent value of K_M , respectively
2. decrease and increase apparent value of K_M , respectively
3. both increase apparent value of K_M

4. both decrease apparent value of K_M

Correct Answer:

increase and decrease apparent value of K_M , respectively

37. Mechanical transmission of plant viruses in indicator plants was first demonstrated for

1. Tomato spotted wilt virus
2. Tobacco rattle virus
3. Tobacco mosaic virus
4. Tomato leaf curl virus

Correct Answer:

Tobacco mosaic virus

38. The fruiting bodies in Agaricus and Morchella are

1. Basidiocarps and Ascocarps, respectively
2. Basidiocarps
3. Ascocarps and Basidiocarps, respectively
4. Ascocarps

Correct Answer:

Basidiocarps and Ascocarps, respectively

39. The genetic material of Tobacco Mosaic Virus is a

1. dsDNA
2. ssRNA
3. ssDNA
4. dsRNA

Correct Answer:

ssRNA

40. Which of the following statements is not correct about aquaporins?

1. Phosphorylation and calcium concentration regulates aquaporin activity.
2. Aquaporins cannot transport uncharged molecules like NH_3 .
3. Aquaporins are found in both plant and animal cell membranes.
4. Activity of aquaporin is regulated by pH and reactive oxygen species.

Correct Answer:

Aquaporins are found in both plant and animal cell membranes

41. Which of the following statements is NOT correct about Gnetum?

1. Tapetal layer is completely absent in the microsporangium.
2. There are no distinct archegonia, and some free nuclei of the female gametophyte function as eggs.
3. The female gametophyte is formed before fertilization.
4. The secondary wood contains vessels.

Correct Answer:

The secondary wood contains vessels.

42. Which of the following statement is not true about lenticels?

1. They are formed by the higher activity of phellogen in some limited areas of the periderm
2. They start appearing during the early stages of primary growth
3. They are found in stems as well as roots
4. They permit the entry of air through the peridem

Correct Answer:

They are formed by the higher activity of phellogen in some limited areas of the periderm

43. Which of the following parts is not observed in a mature seed-coat?

1. Aril
2. Epidermis
3. Aerenchyma
4. Hypodermis

Correct Answer:

Epidermis

44. Which type of wood is found in Pinus and Cycas ?

1. Manoxylic in Pinus, and pycnoxylic in Cycas
2. Manoxylic in both
3. Pycnoxylic in both
4. Pycnoxylic in Pinus, and manoxylic in Cycas

Correct Answer:

Pycnoxylic in Pinus, and manoxylic in Cycas

45. Which one of the following sets of compounds is used as biopesticides?

1. Pyrethrin, Azadirachtin, Spilanthol
2. Pyrethrin, Jatrophine, Curcumin
3. Capsaicin, Citronella oil, Piperine
4. Azadirachtin, Taxol, Curcumin

Correct Answer:

Pyrethrin, Azadirachtin, Spilanthol

46. Which one of the following statements is false for a population that is under natural selection?

1. At a given point of time, the sum total of all genotypic frequencies is equal to one.
2. At a given point of time for any given bi-allelic gene, the sum of the allele frequencies would be equal to one.
3. The genotypic frequencies can be estimated if the allele frequencies are known.
4. The population will not exhibit Hardy-Weinberg equilibrium.

Correct Answer:

The population will not exhibit Hardy-Weinberg equilibrium

47. Which one of the following is not found in Marchantia ?

1. Barrel shaped epidermal pores in the thallus
2. Smooth walled as well as tuberculated rhizoids
3. Filamentous protonema
4. Elaters

Correct Answer:

Smooth walled as well as tuberculated rhizoids

48. Which one of the following crops was the first to have its nuclear genome sequenced?

1. Maize
2. Barley
3. Rice
4. Wheat

Correct Answer:

Maize

49. In non-graminaceous plant roots, iron is transported across the plasma membrane as

1. Both ferrous and ferric ions
2. Ferrous ions
3. Ferric ions
4. Fe-Chelate

Correct Answer:

Both ferrous and ferric ions

50. In root nodules of legumes, leg-haemoglobin is important because it

1. transports oxygen to the root nodule.
2. acts as a catalyst in transamination.
3. acts as an oxygen scavenger.
4. provides energy to the nitrogen fixing bacterium.

Correct Answer:

transports oxygen to the root nodule