

**BOTANY****SECTION-A**

1. Which of the following is against the rules of ICBN?
 - (1) Hand written scientific names should be underlined.
 - (2) Every species should have a generic name and a specific epithet.
 - (3) Scientific names are in Latin and should be italicized.
 - (4) Generic and specific names should be written starting with small letters.
2. In the five-kingdom system of classification, which single kingdom out of the following can include blue-green algae, nitrogen fixing bacteria and methanogenic archaeobacteria?
 - (1) Plantae
 - (2) Protista
 - (3) Monera
 - (4) Fungi
3. Which one of the following is **not** the basis of five Kingdom classification?
 - (1) Cell structure
 - (2) Body organization
 - (3) Reproduction
 - (4) Reserve food material
4. Position of bacteria in the system of classification proposed by Linnaeus is;
 - (1) Monera
 - (2) Protista
 - (3) Plantae
 - (4) Animalia
5. Select the **correct** combination of statements (a) – (d) regarding the characteristics of certain organisms.
 - (a) Methanogens are archaeobacteria which produce methane in marshy areas.
 - (b) *Nostoc* is a filamentous blue-green alga which fixes atmospheric nitrogen.
 - (c) Chemosynthetic autotrophic bacteria synthesize cellulose from glucose
 - (d) *Mycoplasma* lacks a cell wall and can survive Without oxygen.
 - (1) All except
 - (2) All except (c)
 - (3) Only (b) and (c)
 - (4) All except (d)
6. Heterocysts, specialised for nitrogen fixation, occur incertain;
 - (1) red algae (*Batrachospermum*).
 - (2) blue-green algae (*Anabaena*).
 - (3) brown algae (*Laminaria*).
 - (4) green algae (*Spirogyra*).
7. Phylogenetic system brings out;
 - (1) reproductive similarities.
 - (2) grouping according to morphological characters.
 - (3) grouping on the basis of increasing complexities.
 - (4) grouping according to evolutionary trends and genetic relationships.
8. Cell wall of green algae is made up of;
 - (1) inner layer of chitin and outer layer of pectose.
 - (2) inner layer of cutin and outer layer of pectin.
 - (3) inner layer of pectose and outer layer of cellulose.
 - (4) inner layers of cellulose and outer layer of pectose.
9. Choose the **correct** statement with respect to bryophytes.
 - (1) in bryophytes, sexual reproduction is oogamous type.
 - (2) sex organs are unicellular in algae and fungi, but multicellular in bryophytes and angiosperms.
 - (3) archegonium is flask shaped.
 - (4) all of these.
10. Which of the following is **true** about bryophytes?
 - (1) They are thalloid.
 - (2) They contain chloroplast.
 - (3) They possess archegonia.
 - (4) All of these.



11. In mosses, asexual reproduction occurs by;
- (1) fragmentation and budding in the secondary protonema.
 - (2) gemmae and spores formation.
 - (3) fragmentation and spores formation.
 - (4) multi flagellate spores formation.

12. Floridian starch is produced by;
- (1) blue-green algae.
 - (2) red algae.
 - (3) brown algae.
 - (4) grass-green algae.

13. Match **Column-I** with **Column-II** and select the correct option.

| Column-I | | Column-II | |
|----------|--|-----------|--|
| (A) | Agar | (I) | <i>Gelidium, Gracillaria</i> |
| (B) | Algin | (II) | Brown algae |
| (C) | Carragenan | (III) | Red algae |
| (D) | <i>Chlorella</i> and <i>Spirullina</i> | (IV) | Single cell protein, used food supplements by space travellers |

- (1) (A) – (I); (B) – (II); (C) – (III); (D) – (IV)
 - (2) (A) – (IV); (B) – (III); (C) – (II); (D) – (I)
 - (3) (A) – (II); (B) – (I); (C) – (III); (D) – (IV)
 - (4) (A) – (III); (B) – (II); (C) – (I); (D) – (IV)
14. Bryophytes are **not** characterised by
- (1) well developed root system and vascular tissue.
 - (2) rhizoids.
 - (3) alternation of generation.
 - (4) presence of chlorophyll.

15. **Statement-I:** CJD and BSE diseases are caused by Prions.

Statement-II: Prions are free, infectious and low molecular weight RNA molecules.

- (1) Statement I is true and Statement II is false
- (2) Statement II is false and Statement II is true
- (3) Both Statement I and Statement II are true
- (4) Both Statement I and Statement II are false

16. **Statement-I:** Root cap protects the root meristem from the friction of the soil.

Statement-II: Meristematic zone cells are thick walled.

- (1) Both Statement I and Statement II are correct.
- (2) Statement I is correct but Statement II is incorrect.
- (3) Statement I is incorrect but Statement II is correct.
- (4) Both Statement I and Statement II are incorrect.

17. When the margins of sepals or petals overlap one another without any particular direction, the condition is termed as?

- (1) vexillary
- (2) imbricate
- (3) twisted
- (4) valvate.

18. Fill in the blanks and select the correct options.

- (a) Leaves of dicotyledonous plants generally possess __ (i) __ venation.
 - (b) In some __ (ii) __ plants the leaf base may become swollen, which is called the __ (iii) __.
 - (c) In a pinnately compound leaf a number of leaflets are present on a common axis called __ (iv) __.
 - (d) Long, thin, flexible __ (v) __ allow leaf blades to flutter in wind there by __ (vi) __ the leaf and bringing fresh air to leaf surface.
- (1) (i) – parallel; (ii) – leguminous; (v) – stems
 - (2) (i) – reticulate; (iii) – pulvinous; (vi) – cooling
 - (3) (ii) – xerophytic; (iv) – receptacle; (v) – petioles
 - (4) (iii) – leaf blade; (iv) – rachis; (vi) – heating

19. Bud is present in axil of;

- (1) Simple leaf.
- (2) Compound leaf.
- (3) Leaflet.
- (4) Both (1) and (2).



20. Petiole when becomes green, flat and tend to function as leaf, is called as
- (1) Phylloclade.
 - (2) Cladode.
 - (3) Cladophyll.
 - (4) Phyllode.
21. **Assertion (A):** The inner membrane of mitochondria contains enzymes of Krebs's cycle
Reason (R): The mitochondrial matrix contains systems involving electron transport.
- (1) Both, **Assertion (A)** and **Reason (R)**, are true and **Reason (R)** is the correct explanation of **Assertion (A)**.
 - (2) Both, **Assertion (A)** and **Reason (R)**, are true but **Reason (R)** is not the correct explanation of **Assertion (A)**.
 - (3) If **Assertion (A)** is true but **Reason (R)** is false.
 - (4) If **Assertion (A)** is false but **Reason (R)** is true.
22. Select the **incorrect** statement among the following.
- (1) Monocot seeds are generally endospermic.
 - (2) In maize, seed coat is membranous and generally fused with fruit wall.
 - (3) In monocot seed, single large shield shape cotyledon is known as scutellum.
 - (4) In orchids, seeds are endospermic.
23. Select the mismatched pair.
- (1) Gibberellic acid – Increases yield of sugarcane
 - (2) Cytokinin – Promotes apical dominance
 - (3) Ethylene – Sprouting of potato tuber
 - (4) Absciscic acid – Inhibits seed germination
24. What will be the amount of DNA in meiosis I products if a meiocyte contains 20 pg DNA in G1 phase?
- (1) 10 pg
 - (2) 20 pg
 - (3) 40 pg
 - (4) 80 pg
25. **Assertion (A):** Cellular respiration is an exergonic process.
Reason (R): The breaking of C-C bonds of complex compounds through oxidation within the cells, leads to release of considerable amount of energy.
- (1) Both **Assertion (A)** and **Reason (R)** are true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
 - (2) Both **Assertion (A)** and **Reason (R)** are true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
 - (3) **Assertion (A)** is true, and **Reason (R)** is false.
 - (4) **Assertion (A)** is false, and **Reason (R)** is true.
26. **Assertion (A):** Chemosynthetic pathway occur in stroma of chloroplast
Reason (R): Enzyme required for chemosynthetic pathway present in stroma.
- (1) Both, **Assertion (A)** and **Reason (R)**, are true and **Reason (R)** is the correct explanation of **Assertion (A)**
 - (2) Both, **Assertion (A)** and **Reason (R)**, are true but **Reason (R)** is not the correct explanation of **Assertion (A)**
 - (3) If **Assertion (A)** is true but **Reason (R)** is false
 - (4) If **Assertion (A)** is false but **Reason (R)** is true
27. Chlorophyll a appears _____ in colour and chlorophyll b appears _____ in colour in the chromatogram.
- (1) Bluish green, yellowish green
 - (2) Yellowish green, bluish green
 - (3) Blue, blue
 - (4) Green, green
28. Collenchyma is a type of mechanical tissue but is **not** as efficient as sclerenchyma. However, they have certain advantages like
- (1) It offers no resistance to the growing organs.
 - (2) It has no cellulose in the cell wall.
 - (3) It is flexible.
 - (4) It has the power of growth.
29. Which of the following is **true** about stomata?
- (1) Formed by guard cells
 - (2) Regulate process of transpiration and gaseous exchange
 - (3) Mainly present on epidermis of leaves
 - (4) All of these



30. **Assertion (A):** The number of cells in a multicellular organism is inversely proportional to the size of organism.

Reason (R): All the cells in the living world are of same size.

- (1) Both **Assertion (A)** and **Reason (R)** are true and **Reason (R)** is the correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are true but **Reason (R)** is not the correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is true but **Reason (R)** is false.
- (4) Both **Assertion (A)** and **Reason (R)** are false.

31. **Assertion (A):** Under anaerobic conditions, pyruvate gives rise to lactate in some bacteria.

Reason (R): Under anaerobic condition, pyruvate gives rise to acetyl-CoA.

- (1) Both, **Assertion (A)** and **Reason (R)** are true and **Reason (R)** is the correct explanation of **Assertion (A)**.
- (2) Both, **Assertion (A)** and **Reason (R)** are true but **Reason (R)** is not the correct explanation of **Assertion (A)**.
- (3) If **Assertion (A)** is true but **Reason (R)** is false.
- (4) If **Assertion (A)** is false but **Reason (R)** is true.

32. Agranular ER of muscle cells is also called;

- (1) sarcoplasmic reticulum.
- (2) Nissl's granules.
- (3) desmotubules.
- (4) dictyosome.

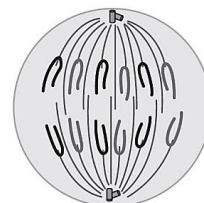
33. Cytoskeleton helps in;

- (1) mechanical support to cell.
- (2) providing mobility to cell.
- (3) maintenance of the shape of cell.
- (4) All of these.

34. The events in a cell cycle are under the;

- (1) environmental control.
- (2) genetic control.
- (3) physiological control.
- (4) control of tubulin protein.

35. Identify the phase of mitotic cell division from the given diagram.



- (1) Prophase
- (2) Metaphase
- (3) Anaphase
- (4) Telophase

SECTION-B

36. Anaphase I is represented by;

- (1) separation of sister chromatids.
- (2) separation of homologous chromosomes.
- (3) uncoiling of sister chromatids.
- (4) coiling of non-sister chromatids.

37. Which one of the following statements is **correct**, with reference to enzymes?

- (1) Holoenzyme = Apoenzyme + Coenzyme
- (2) Coenzyme = Apoenzyme + Holoenzyme
- (3) Apoenzyme = Holoenzyme + Coenzyme
- (4) Apoenzyme = Holoenzyme + Coenzyme

38. Number of chromosome groups at equatorial plate of metaphase I of a plant body having $2n = 50$ chromosomes shall be;

- (1) 100
- (2) 75
- (3) 50
- (4) 25

39. In Krebs's cycle, the FAD precipitates as electron acceptor during the conversion of;

- (1) Succinyl CoA to succinic acid
- (2) α -ketoglutarate to succinyl CoA
- (3) Fumaric acid to maleic acid
- (4) Succinic acid to fumaric acid



40. During diplotene the recombined homologous chromosomes of the bivalents tend to separate from each other except at the site of crossovers. If they fail to separate during anaphase I, what among following will result? Choose the **correct** alternative.
- I.** One cell would have $(n+1)$ set of chromosome.
II. One cell would have $(n-1)$ set of chromosome.
III. One cell would have $4n$.
IV. 2 cells will have haploid set of chromosome
- (1) Only I is correct
(2) I and II are correct
(3) I, II and IV are correct
(4) None of the above is correct
41. The methodology, which has been most useful for investigating the Calvin cycle, is;
- (1) radioactive isotope technique.
(2) inverted funnel experiment.
(3) half-leaf experiment.
(4) flash light experiment technique.
42. The reactions of Calvin cycle do **not** directly dependent on light, but they usually do not occur at night. Why?
- (1) Night is often too cold for these reactions to occur.
(2) CO_2 concentration in night is too high for these reactions to occur.
(3) Plants usually open their stomata at night.
(4) Calvin cycle is dependent on the products of light reaction.
43. In non-cyclic photophosphorylation;
- (1) only ATP is synthesised.
(2) last electron acceptor is ferredoxin.
(3) NADP reductase activity requires H^+ from stroma.
(4) there is involvement of only PS I.
44. During glycolysis, one glucose molecule splits into(a)..... molecule(s) of glyceraldehyde 3-phosphate, while during Calvin cycle,(b)..... molecules of glyceraldehyde 3-phosphate give rise to one molecule of glucose.
- (1) (a) – one; (b) – two
(2) (a) – two; (b) – two
(3) (a) – two; (b) – three
(4) (a) – three; (b) – three
45. A false statement regarding cytochrome c-oxidase Complex in ETS in mitochondria is;
- (1) received electrons directly from ubiquinone.
(2) capable of reducing O_2 .
(3) extended across the thickness of inner Mitochondrial membrane.
(4) Contained Fe and Cu both.
46. Chemosynthetic bacteria obtain energy from;
- (1) Sun
(2) Infra-red rays
(3) Organic substances
(4) Inorganic chemicals
47. Energy required for ATP synthesis in PSII comes from;
- (1) Proton gradient
(2) Electron gradient
(3) Reduction of glucose
(4) Oxidation of glucose
48. During light reaction in photosynthesis, which of the following are formed?
- (1) ATP and sugar
(2) Hydrogen, O_2 and sugar
(3) ATP, hydrogen donor and O_2
(4) ATP, hydrogen and O_2 donor
49. Mitochondria are called powerhouses of the cell. Which of the following observations supports this statement?
- (1) Mitochondria synthesises ATP.
(2) Mitochondria have a double membrane.
(3) The enzymes of the Krebs cycle and the cytochromes are found in mitochondria.
(4) Mitochondria are found in almost all plants and animal cells.
50. *Cycas* and *Azolla* plants are associated with
- (1) *Bacillus*.
(2) *Klebsiella*.
(3) *Anabaena*.
(4) *Rhizobium*

