



Sample Paper-02

Class 11th NEET (2024)

BOTANY

ANSWER KEY

1. (2)
2. (3)
3. (2)
4. (4)
5. (3)
6. (3)
7. (2)
8. (2)
9. (3)
10. (4)
11. (4)
12. (2)
13. (4)
14. (1)
15. (2)
16. (1)
17. (2)
18. (1)
19. (4)
20. (4)
21. (4)
22. (4)
23. (4)
24. (4)
25. (3)

26. (4)
27. (4)
28. (1)
29. (3)
30. (2)
31. (1)
32. (3)
33. (3)
34. (4)
35. (4)
36. (3)
37. (2)
38. (1)
39. (4)
40. (3)
41. (3)
42. (1)
43. (4)
44. (3)
45. (4)
46. (4)
47. (1)
48. (1)
49. (1)
50. (4)



HINTS AND SOLUTION

1. (2)
Felis and Panthera are placed under family felidae.
Solanaceae + *Convolvulaceae* are placed under order Polymoniales.
2. (3)
Scientific names are meant to avoid multiple naming and provide a universal way to refer to organisms.
3. (2)
Systematics is not a basic process in taxonomy; rather, it's a broader field that includes taxonomy as a part of its study.
4. (4)
Potato and brinjal are two different Species but both belongs to the genus Solanum.
In Mangifera indica, Mangifera and indica are generic and Species epithets, respectively.
5. (3)
Dikaryon ($n + n$) condition is seen in ascomycetes & basidiomycetes. Sex organs are absent in basidiomycetes. Therefore, correct answer is option (3) basidiomycetes.
6. (3)
The bacterium that develops flavor in tea and tobacco leaves is *Bacillus megaterium*.
7. (2)
Aristotle classified plants into trees, shrubs and herbs on the basis of simple morphological characters. He also classified animals into two groups, Anaima and Enaima. Enaima included vertebrates having red blood cells and Anaima included vertebrates having no red blood cells.
8. (2)
Slime moulds are saprophytic protists. Their vegetative phase is represented by a free living, mass of protoplasm (called plasmodium) without walls and produce haploid spores which are dispersed by air currents.
9. (3)
In an artificial system of classification, organisms are classified based on a few selected characters or criteria that are chosen for convenience or practical purposes, rather than considering their evolutionary relationships or phylogenetic trends. This system does not aim to reflect the true natural relationships between organisms but is used for ease of identification and categorization.
10. (4)
 - (1) Many species of Porphyra, Laminaria, and Sargassum are indeed among the approximately 70 species of marine algae that are used as food.
 - (2) Agar is commonly used for growing microbes in laboratory settings and is also used in the preparation of ice creams and jellies.
 - (3) Algae have various uses and are indeed beneficial to humans in multiple ways, such as providing food, serving as a source of agar, and contributing to the environment.
11. (4)
Majority of them are fresh water organisms found in stagnant water. Instead of a cell wall, they have a protein rich layer called pellicle which makes their body flexible.
They have two flagella, a short and a long one.
Though they are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs by predating on other smaller organisms. Interestingly, the pigments of euglenoids are identical to those present in higher plants.
12. (2)
Elaters are present in the sporogonium of Marchantia, which is a liverwort. Elaters are specialized, hygroscopic, and ribbon-like cells found in the capsules of some non-vascular plants like liverworts, including Marchantia. They play a role in spore dispersal by responding to changes in humidity and helping to release spores into the environment.



- 13. (4)**
Bryophytes, which include mosses, liverworts, and hornworts, are simple plants that lack vascular tissues like xylem and phloem. They are characterized by having a dominant gametophytic generation, filamentous structures called rhizoids for anchorage, and they are typically found in amphibious habitats where they require water for sexual reproduction. However, they lack the complex vascular tissues found in more advanced plants like ferns, gymnosperms, and angiosperms.
- 14. (1)**
(A) Agar - (I) Gelidium, Gracillaria
(B) Algin - (II) Brown algae
(C) Carrageen - (III) Red algae
(D) Chlorella and Spirulina - (IV) Single-cell protein, used as food supplements by space travelers
So, the correct option is:
(A) – (I); (B) – (II); (C) – (III); (D) – (IV)
- 15. (1)**
CJD and BSE diseases are caused by Prions. Viroids are free, infectious and low molecular weight RNA molecules.
- 16. (1)**
- 17. (2)**
Absorption of water from soil is main function of roots.
- 18. (1)**
"To spread out branches bearing leaves and buds," is not a function of roots. Roots primarily anchor the plant, absorb water and minerals, and may also store reserve food material.
- 19. (4)**
Phyllode- Acacia; Cladode- Ruscus; Phylloclade- Opuntia
- 20. (4)**
"Has nodes and internodes" is the correct distinguishing feature of ginger and other stems from roots. Stems typically have nodes (points of leaf attachment) and internodes (the regions between nodes), which are not present in roots.
- 21. (4)**
"It is arranged in basipetal order" is incorrect. Leaves are typically arranged in an acropetal order on the stem, meaning that the younger leaves are located near the tip or apex of the stem, while older leaves are found towards the base of the stem. Basipetal order would imply the reverse, with younger leaves at the base and older leaves at the tip, which is not the usual arrangement for leaves on a stem.
- 22. (4)**
"Leaf is not a transpiring organ" is false. Leaves are indeed transpiring organs. Transpiration is the process by which water is lost from the aerial parts of a plant, primarily through small openings called stomata in the epidermis of leaves. This loss of water vapor from leaves is an essential part of the plant's physiology, as it helps in the uptake of water and nutrients from the soil and the movement of water and nutrients throughout the plant.
- 23. (4)**
The position of mother axis with respect to the flower is represented by a dot on the top of the floral diagram.
The Fabaceae family was earlier called papilionoidae, a subfamily of family leguimonosae.
- 24. (4)**
The style is not the receptive surface for pollen grains. The stigma is the receptive surface where pollen grains land and germinate to form pollen tubes for fertilization. The style connects the stigma to the ovary, providing a pathway for pollen tubes to reach the ovules inside the ovary.
- 25. (3)**
(a) – Endosperm; (b) – Embryo; (c) – Scutellum; (d) – Coleoptile; (e) – Coleorrhiza
- 26. (4)**
All statements are incorrect.
- 27. (4)**
Staminal tube is a tube-like structure form by the fusion of filaments of indefinite stamens present in malvaceae family



28. (1)
In Gymnosperms, the phloem lacks both the sieve tube and the corresponding cells. Instead they contain sieve cells for food material conduction.
29. (3)
The tissue that is characterized by dead cells is Sclerenchyma.
30. (2)
Aestivation is the arrangements of accessory floral organs (sepals or petals) in relation to one another in floral bud. It may be of open, valvate, twisted or imbricate type. In imbricate aestivation there is an irregular overlapping of petals or sepals by one another. Cassia, gulmohar, etc., show imbricate aestivation.
31. (1)
The pericycle in plants is primarily responsible for the initiation of lateral roots and the initiation of vascular cambium.
32. (3)
The German botanist who examined a large number of plants and observed that all plants are composed of different kinds of cells which form the tissue of the plant is Schleiden.
33. (3)
The structure of cell membrane was proposed by Singer and Nicolson (1972) widely accepted as fluid mosaic model. According to this, the quasi-fluid nature of lipid enables lateral movement of proteins within the overall bilayer. This ability to move within the membrane is measured as its fluidity. The fluid nature of the membrane is important for functions like cell growth, formation of intercellular junctions, secretion, endocytosis, cell division etc.
34. (4)
The ER is not found in all living cells. Some cells, like mature red blood cells in mammals, lack a nucleus and many membrane-bound organelles, including the ER.
35. (4)
Axoneme is the central strand of a cilium or flagellum. It is composed of an array of microtubules, typically in nine pairs around two single central ones. Cilia and flagella is made of the axoneme which is composed of microtubules and their associated proteins.
36. (3)
After G_1 , the cells enter the S phase or the synthesis phase.
DNA replication occurs during the S phase.
This implies the duplication of the $(2n)$ chromosomes or $2 \times (2n) = 4n$.
 $4n = 4pg$ (at S-phase)
Haploid cell DNA content = $1pg$
37. (2)
The stage of cell division at which the morphology of chromosomes is most easily studied is Metaphase. During metaphase, the chromosomes align along the equatorial plane of the cell, making them highly visible and easily observable under a microscope.
38. (1)
The sites at which crossing over occurs between non-sister chromatids of homologous chromosomes. Recombination nodules, also known as chiasmata, are the locations where genetic recombination or crossing over takes place between non-sister chromatids of homologous chromosomes during meiosis. This is an important process in generating genetic diversity among offspring.
39. (4)
Anaphase I of meiosis is characterized by the splitting of the centromere of homologous chromosomes, leading to the separation of homologous chromosome pairs and their movement to opposite poles of the cell. This is in contrast to anaphase II, where the centromere splits, separating sister chromatids.
40. (3)
In China rose the flowers are actinomorphic, i.e., it can be divided into two equal radial halves any radial plane passing through the centre; they are hypogynous, i.e., the gynoecium occupies the highest position, while the other parts are situated below it; they have twisted aestivation, i.e., one margin of petal overlaps that of the next one and so on.



41. (3)
The Calvin cycle is also known as C_3 cycle because CO_2 reduction is cyclic process and first stable product in this cycle is a 3-C compound (i.e., 3-phosphoglyceric acid or 3-PGA). In this cycle, CO_2 acceptor molecule is RuBP or RuDP (i.e., Ribulose 1, 5-biphosphate or Ribulose 1, 5-diphosphate). There occurs covalent bonding of CO_2 to RuBP and the enzyme catalyzing this reaction is RuBP-carboxylase/oxygenase (RuBisCO).
42. (1)
When two different types of spores are present in an organism, it is called heterosporous.
43. (4)
Far red or infra-red wavelength of light carry out photosynthesis in bacteria. Bacteriochlorophyll is the light harvesting pigment found in bacteria. It has strong absorbance near infra-red wavelength.
44. (3)
Biosynthetic phase of life use all except oxygen that is produced in photochemical phase.
45. (4)
The bundle sheath cells may form several layers around the vascular bundles; they are characterised by having a large number of chloroplasts, thick walls impervious to gaseous exchange and no intercellular spaces.
46. (4)
In photosynthesis, several factors can limit the rate of the process. These include light intensity, carbon dioxide concentration, and temperature. When one of these factors becomes limiting, increasing the intensity of that factor beyond a certain point won't result in a proportional increase in the rate of photosynthesis. Instead, the process will be limited by whichever factor is in shortest supply. In the case of higher light intensities, other factors like CO_2 concentration or temperature might become limiting, which is why the rate of photosynthesis doesn't continue to increase indefinitely.
47. (1)
In the Krebs cycle (also known as the citric acid cycle or TCA cycle), each acetyl coenzyme A (Acetyl-CoA) undergoes one cycle of reactions, which includes four oxidation reactions and two decarboxylations.
48. (1)
In alcoholic fermentation, NAD^+ is produced during the reduction of acetaldehyde to ethanol. This reaction helps regenerate NAD^+ from NADH, which is needed to sustain glycolysis and continue producing ATP in the absence of oxygen.
49. (1)
Since increase in protoplasm is difficult to measure directly, one generally measures some quantity which is more or less proportional to it. Growth is, therefore, measured by a variety of parameters some of which are: increase in fresh weight, dry weight, length, area, volume and cell number.
50. (4)
ABA (abscisic acid) has multiple functions in plants, including inhibiting general plant growth, acting as an inhibitor of some metabolic processes, and stimulating the closure of stomata in the epidermis to regulate water loss. So, all the provided options are correct.

