General Instructions:
1. All questions are compulsory.
2. Question paper contains four sections: A, B, C&D. Section –A contains 8 questions of 1 mark each, Section – B is of 10 questions of 2 marks each, Section C has 9 questions of 3 marks each whereas, Section D is of 3 questions of 5 marks each.
3. There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks & all the three questions of five marks. A student has to attempt only one of the alternatives in such questions.
4. Wherever necessary, the diagrams drawn should be neat and properly labeled.

SECTION-A

1. Name the infectious agent that causes Potato spindle tuber disease and give one characteristic feature of it.
2. Name the group of plant that has a dominant, independent, photosynthetic plant body which is a sporophyte and also name its short lived haploid gametophyte.
3. (a) Name the organ of locomotion in aquatic Annelids.
   (b) Name the Phylum where animals bear eight external rows of ciliated Comb plates.
4. Name the food reserve of Rhodophyta and comment on its structure.
5. Identify the absorption spectrum of Chlorophyll b and carotenoids in the graphical representation shown below:-

P.T.O.
6. Expand ICBN
7. Where exactly are synaptic vesicles located? What is their role?
8. Why is NADPH+H⁺ not synthesized in the cyclic photophosphorylation?

SECTION-B

9. What is oxidative decarboxylation? What happens to pyruvate immediately after this reaction? Name the enzyme involved in this reaction.
10. Name the endocrine gland which is located on the dorsal surface of the heart and the aorta. Mention any three ways the person is likely to suffer if the gland disappears.
11. What is the role of carbonic anhydrase? Show by series of reactions, how carbon dioxide is exchanged at the tissue site and at alveolar site?
12. (a) Where and how is urea produced in ureoteleic animals?
(b) Henle’s loop plays a significant role in maintaining high osmolarity rate of medullary interstitial fluid. Explain
13. When does each of the following take place in Meiosis?
   a) Centromere splits and chromatids separate
   b) Pairing between homologous chromosomes take place.
   c) Crossing over between homologous chromosomes take place.
   d) Chromosomes are moved to the spindle equator.
14. Identify the type of Aestivation in A,B,C and D

(2)
14. Identify the type of Placentation in A, B, C and D

15. Identify the basic body forms 'a' and 'b', name the phylum in which such body forms are present. Give one example for each of the body form.

16. Observe the histological feature given below and label the parts A, B, C, and D

17. Give reasons:
   (a) 'Without metabolism there cannot be a living state.' Why?
   (b) α-amino acids are substituted methanes.

18. (a) Explain how gizzard in Cockroach helps in grinding food.
(b) Accidentally a Cockroach's head was severed, but it was found to be alive. Give reason as to how it can be alive?

SECTION C

19. Shown below is the floral diagram of a family. Identify the family and write the floral formula. Give an example of a medicinal and an ornamental plant belonging to this family.

20. What do you mean by energy of activation? Graphically represent the concept of activation energy.

21. Draw the diagram of Human eye and label the following parts:
   (a) Where cones are densely packed and visual acuity is the greatest.
   (b) The part that regulates the diameter of pupil.
   (c) The layer which is composed of a dense connective tissue.
   (d) The chamber which is filled with transparent gel.

   OR

   Draw the diagram of Human ear and label the following parts:
   (a) The part that increases the efficiency of transmission of sound waves to the inner ear.
   (b) The part that helps in equalizing the pressures in the either sides of the ear drum.
   (c) Coiled portion of the inner ear that is the part of membranous labyrinth.
   (d) The part of vestibular apparatus that has tubes lying in different planes at right angles to one another.

22. (a) Name the volatile substance that is released from ripened oranges, that hastens ripening in raw fruits.
   (b) Callus cultures of tobacco proliferated on addition of auxin and yeast extract. Name the growth promoting substance present in yeast extract.
   (c) Name the fungal pathogen that causes foolish seedling disease in rice plant.
(d) Name the hormone that increases the internodal distance in plants having rosette habit.
(e) Name the widely used source of Ethylene.
(f) Name the technique employed by gardeners to develop the hedge.

23. Name the following:
(a) The mineral that is an important constituent of cytochrome.
(b) The group of enzymes that Zinc activates.
(c) The mineral that plays an important role in Nitrogen metabolism.
(d) The mineral that is responsible for uptake and utility of Ca.
(e) The mineral that helps in maintaining ribosomal structure.
(f) The mineral that activates catalase enzyme.

24. Observe the figure given below and answer the following:
(a) Identify the process occurring in (I), (II) and (III).
(b) Differentiate between the process II and III.
(c) How many types of aquaporins form the water channels in the cell membrane?

25. (a) Differentiate between Pili and Fimbriae of Bacteria.
(b) What is the composition of cell wall of Algae?

26. What is Periderm? How does Periderm formation take place in the dicot stem?

27. (a) Mention any two functions of Large intestine.
(b) Mention the role of parietal cells in the gastric glands.

OR

(b) Draw the diagram of myosin monomer and label actin binding site and ATP binding site.
(c) How is Arthritis different from Gout?
28. Observe the following diagram:-
   (a) Label A and B
   (b) Fill in the missing link as indicated.
   (c) If the mesophyll part of the vertical section of leaves belonging to 
   C₃ and C₄ plant is studied what differences will be observed? state 
   any three of them.

OR

28. (a) Mention the two crucial events taking place in aerobic respiration.
   (b) Differentiate between fermentation and aerobic respiration(any two 
   points of difference)
   (c) Explain how energy released during the electron transport system is 
   utilized in synthesizing ATP with the help of ATP synthetase

29. (a) Identify the sub stages ‘A’ and ‘B’ and write any two points that 
   characterizes and distinguishes the depicted stages.
29. (b) Mention any two significance of meiotic cell division.

OR

(a) Enumerate the similarities between a Prokaryote and Mitochondria.
(b) Name the enzymes that are found in an isolated lysosomal vesicle.
(c) Why the concentration of ions in the fluid filled vacuole more than the cytoplasm?
(d) Why Golgi apparatus remains in close association with the endoplasmic reticulum?

30. Observe the diagram that depicts the conducting system of heart and answer the questions that follow:

(a) Label the parts A, B, C and D and also mention the role of A and B.
(b) Name the membranous bag which protects the above organ.
(c) What is hepatic portal system?