



General Instructions:-

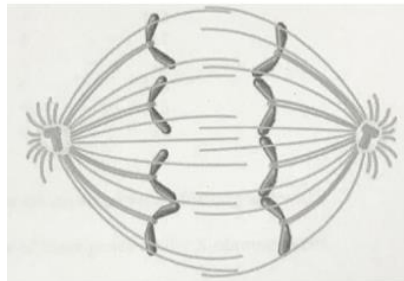
- This question paper consists of four sections **A, B, C & D**. Section **A** contains **5** questions of **1** mark each, section **B** is of **7** questions of **2** marks each, section **C** is of **12** questions of **3** marks each and section **D** is **3** questions of **5** marks each.
- All questions are compulsory.
- There is no overall choice. However, an internal choice is provided in one question of **2** marks, one question of **3** marks and all questions of **5** marks weightage. Attempt only **one** of the choices in such questions.
- Questions of section **A** are to be answered in one word or **one sentence** each, section **B** in approximately **20-30** words each, section **C** in **30-50** words each and section **D** in **80-120** words each.
- Wherever necessary, the diagrams drawn should be neat and properly labeled.

SECTION-A

1. What will happen to water potential when solutes are added? 1
2. Write the floral formula of a zygomorphic, bisexual hypogynous flower with five united sepals, five free petals, five free stamens and two syncarpous superior ovary with parietal placentation. 1
3. A farmer adds *Azotobactor* culture to soil before sowing maize. Which mineral element is being replenished? 1
4. What are co factors? 1
5. Which one of the following cellular part is correctly described? 1
 - a) Thylakoid – Flattened membranous sacs forming the grana of chloroplast
 - b) Centriole – Active site of RNA synthesis
 - c) Ribosome – Those on chloroplast are 80S and those in cytoplasm are 70S
 - d)

SECTION-B

6. Differentiate between guttation and transpiration. 2
7. Label the diagram given below and determine the stage at which this structure is visible during cell division. 2



8. a) While eating peach or pear it is usually seen that some stone like structures entangled in the teeth, what are these stone like structures called? 2
- b) The lawn grass (*Cyanodon dactylon*) needs to be cropped frequently to prevent its overgrowth. Which tissue is responsible for its rapid growth after cropping?
9. How are root nodule formed in the roots of leguminous plants?
10. 'All elements that present in a plant need not be essential for its survival.' Comment. 2

OR

a) Which of the following statements are true? If false correct them:

Boron deficiency in plants leads to

b) Magnesium forms the structural part of cell wall. 2

11. Which cell organelle is considered to be semi-autonomous? Why? 2

12. How is key helpful in identification and classification of an organism? 2

SECTION-C

13. Describe Transpiration pull model of water transport in plants. How is it useful to plants? 3

14. Justify the following statements on the basis of external features. 3

a) Potato is a stem but sweet potato is a root

b) Apple is a false fruit.

OR

Tendrils of grapevine are homologous to the tendrils of pumpkin, but are analogous to that of pea. Comment. 3

15. a) 'Fungi are cosmopolitan in distribution', write the role of fungi in your daily life. 3

b) What are methanogens?

16. What is heterospory? Briefly comment on its significance. Give two examples. 3

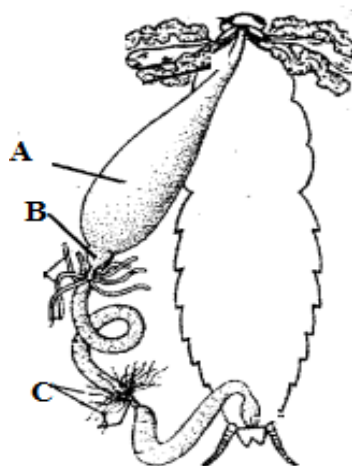
17. Fill in the blank spaces appropriately. 3

Phylum/Class	Excretory organ	Circulation	Respiratory organ
Arthropoda	a).....	b).....	Lungs/Gills/Tracheal system
c).....	Nephridia	d).....	Skin/Parapodia
Amphibia	e).....	Closed	f).....

18. What is meant by apoplast pathway? Why does it occur in cortex and not in endodermis? 3

19. Draw the flowchart of nitrogen cycle showing relationship between the three nitrogen pools (soil, atmosphere and biomass). 3

20. Label the parts marked A, B and C in the given figure and mention its role in digestion. 3



21. What is collenchyma? Explain its structure and function in the plant body of a herbaceous angiosperm. 3

22. Describe the structure of Golgi apparatus and state its function. 3
23. What are different classes of enzymes? Describe any one factor that affects enzyme activity. 3
24. Muscles play an active role in all the movements of the body. How are muscular tissues classified based on their structure and function? 3

SECTION-D

25. Elaborate the process of secondary growth in a typical dicot stem with the help of diagrams. 5

OR

Differentiate between the following:

- a) Exarch and Endarch
 - b) Sapwood and Heartwood
 - c) Protoxylem and Metaxylem
 - d) Trichome and root hair
 - e) Dorsiventral and Isobilateral leaf.
26. a) Describe fluid-mosaic model of plasma membrane. 5
- b) Briefly explain the cartwheel structure of cilia.

OR

Plant X has $2n=4$ chromosomes. Sketch the various stages of meiosis I in this plant.

27. Name the phylum in which the following animals belong to and Write any four salient features of that phylum. 5

Sea Urchin, Asterias, Holothuria, Brittle star

OR

Give three major differences between chordates and non-chordates and draw a schematic sketch of chordates showing those features.
