This question paper contains 4+2 printed pages]

Your Roll No. .....

939

B.Sc. (Hons.)/III **C**

BOTANY — Paper IX

(Developmental and Functional Plant Anatomy)

(Admissions of 2004 and onwards)

Time : 3 *Hours* *Maximum Marks* : 38

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer *Five* questions in all, including Q. No. 1 which is compulsory. Draw labelled diagrams and answer all parts of a question together.

1. (*a*) Fill in the blanks : ½×5=2½

(*i*) A type of stomata without subsidiary cells is known as ..... .

(*ii*) ..... are bundles of needle-like crystals of calcium oxalate found in certain plant cells.

P.T.O.

(*iii*) Amphivasal vascular bundles are found in the genus ..... .

(*iv*) Velamen is found in the roots of ..... .

(*v*) The non-suberized cells which occur within the cork are called ..... .

(*b*) Give the generic name of the plant (one each) you would select to study the following : ½×5=2½

(*i*) Phloem 'islands'

(*ii*) Compound sieve plate

(*iii*) Multiple epidermis

(*iv*) Cyclocytic stomata

(*v*) Cystolith

(*c*) Define/Explain the following (attempt any *five*) : 1×5=5

(*i*) Pharmacognosy

(*ii*) Dendrochronology

(*iii*) Calyptrogen

(*iv*) Plastochron

(*v*) Trichoblast

(*vi*) Errera's law

2 (*a*) Differentiate between any *three* of the following : 2×3=6

(*i*) Phellem and phelloderm

(*ii*) Apical and lateral meristems

(*iii*) Compression wood and tension wood

(*iv*) Indeterminate and determinate roots

(*v*) Articulated and non-articulated laticifers.

(*b*) What are 'T' divisions ? Name the theory which is based solely on such divisions. 1

3. (*a*) Write short notes on any *three* of the following : 2×3=6

(*i*) Secondary growth in Monocots

(*ii*) Chemical composition of cell wall

(*iii*) Transfer cells

(*iv*) Growth rings

(*v*) Applications of plant anatomy in Forensics.

(*b*) What is clearing technique ? What is its role in studying the plant parts ? 1

4. (*a*) Give an illustrated account of the theories of shoot apex organization in Angiosperms. 3

(*b*) What is the difference between cuticularization and cutinization. 2

(*c*) Draw labelled outline diagrams of any *two* : 2

(*i*) T.S. *Helianthus* root

(*ii*) T.S. *Cucurbita* stem

(*iii*) V.S. *Zea mays* leaf.

5. (*a*) Give a brief account of the anatomical adaptations of hydrophytes. Exemplify your answer with a labelled diagram of a transection of *Hydrilla* stem or *Nymphaea* petiole. 3

(*b*) A tree can survive, even if a tunnel is cut through its centre. However, removing a complete ring of bark around the trunk, will kill the tree. Why ? 2

(*c*) Draw the peel mount of *Saccharum* leaf and explain the structure of the various cells. 2

6. (*a*) Describe the unusual anatomical conformations in mature stem of *Bignonia or Boerhaavia*. Illustrate your answer with well-labelled diagrams. 3

(*b*) What are the generall characteristics of storage organs and tissues ? 2

(*c*) Comment briefly on root cap as a secretory organ. 2

7. (*a*) Write a note on the structure, distribution and functions of collenchyma. 3

(*b*) Explain the process of cytodifferentiation of sieve elements and sieve plate formation with the help of labelled diagrams. 3

(*c*) What is a scale leaf ? 1