(b) Explain anatomical adaptation in Nerium leaf with a labelled diagram. (5)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 2030 **L**

Unique Paper Code : 2162012403

Name of the Paper : Developmental Biology of Angiosperms: Form, Anatomy and Function

Name of the Course : **B.Sc. (Hons) Botany**

Semester : VI

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question No. **1** is compulsory. Attempt **Four** questions in all. **All** questions carry equal marks.
3. **All** parts of questions must be attempted together.
4. Draw well labelled diagrams wherever necessary.

1. (a) Fill in the blanks **(any five)** : (1×5=5)

(i) The rod-like sclereids are called as _____ .

(ii) Epidermis in xerophytic plants is often covered by a waxy layer known as _____ .

(iii) In _____ vascular-bundles, the xylem is surrounded by two strands of phloem.

(iv) Tunica-corpus theory was given by _____ .

(v) _____ are large thin-walled epidermal cells in grass leaves that help in folding and unfolding during water stress.

(c) Laticifers

(d) Shoot Chimeras

(e) Seasonal activity of vascular cambium

5. (a) Write a note on types of trichomes with suitable examples and diagrams. (5)

(b) Explain the structure and functions of the lateral meristem in plants. Elucidate how it contributes to secondary growth in a dicot stem with suitable diagrams. (10)

6. (a) Critically compare the Apical Cell Theory, Histogen Theory, and Tunica Corpus Theory. Highlight their limitations in explaining shoot apex organisation in angiosperms. (10)

(d) Ring porous wood and diffuse porous wood

(e) Adcrustation and Incrustation

3. Draw a well labelled diagram of **(any three)** :

(3×5=15)

(a) Vertical section of a leaf showing Kranz anatomy

(b) Transverse section of a stem showing phloem wedges

(c) Longitudinal section of root apex

(d) Transverse section of Dicot root

4. Write short notes on **(any three)** : (3×5=15)

(a) Ergastic substances

(b) Applications of anatomy in Forensics

(vi) _____ present in endodermis blocks the apoplastic transport in the root.

(vii) Non-Protoplasmic materials found in cells are _____ .

(b) Give one word for the following **(any five)** :

(1×5=5)

(i) Parenchyma cells are designed for high-volume nutrient transfer with unique cell-wall ingrowth labyrinths present in minor veins of the leaf.

(ii) A hemispherical region of inactive cells located between the root cap and the active meristematic region in a plant's roots.

(iii) The outermost, dead layer of bark on trees and woody plants, comprising accumulated periderm, cortex, and phloem tissues.

(iv) Wood formed in trees in response to gravitational stimuli that cause stems or branches to bend or lean.

(v) Specialised pores on leaf margins or tips that secrete water in liquid form through a process called guttation.

(vi) The process of maturation of unspecialized cells from meristems into specialised types (e.g., xylem, phloem, epidermal cells) to perform specific functions.

(c) Define the following terms **(any five)** :

(1×5=5)

(i) Aerenchyma

(ii) Calyptrogen

(iii) Open vascular bundle

(iv) Plasmodesmata

(v) Cuticularization

(vi) Amphistomatic leaf

2. Differentiate between **(any three)** : (3×5=15)

(a) Sclerenchyma and Collenchyma

(b) Monocot root and Dicot root

(c) Inner bark and outer bark