

[This question paper contains.4 printed pages.]

1306

Your Roll No. ....

B.Sc. (Hons.)/III

A

BOTANY – Paper XI

(Plant Physiological Processes, Growth and  
Development)

(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.)*

*Attempt five questions in all,  
including Q. No. 1 which is compulsory.*

1. (a) Fill in the blanks :

- (i) The occurrence of a break in the continuity of water column in xylem is known as \_\_\_\_\_.
- (ii) The promotive effect of low temperature on flowering is termed \_\_\_\_\_.
- (iii) The observation of leaf fall from trees located near street lamps in olden days, led to the discovery of \_\_\_\_\_.
- (iv) The promotive effect of low temperature on seed germination is termed as \_\_\_\_\_.

P.T.O.

- (v) The phenomenon of stem elongation in rosette plants, followed by flowering, is known as \_\_\_\_\_ . (1×5=5)

(b) Give reasons for the following :

- (i) Influx and efflux of  $K^+$  into the guard cells affects the rate of transpiration.
- (ii) Whereas young leaves are sinks and mature leaves act as source. (2+2=4)

(c) Match the followings :

EDTA	Cytokinin
Zeatin	Secondary metabolite
Antiauxin	Chelating agent
Jasmonate	TIBA
Anti transpirant	ABA (1×5=5)

2. Write short notes on any three of the following :

- (a) Apical dominance
- (b) Nyctinasty
- (c) Kinetics of growth
- (d) HSPs
- (e) Bioassay
- (f) Gibbs free energy (3×2=6)

3. Write a detailed account on any **two** of the following :

- (a) Hydroponics
- (b) Salt stress
- (c) Biological clock
- (d) Criteria of essentiality of nutrients (3×2=6)

4. Distinguish between any **three** of the following :

- (a) Cell Growth and cell differentiation
- (b) Photomorphogenesis and Skotomorphogenesis
- (c) Diffusion and osmosis
- (d) Phototropism and geotropism
- (e)  $P_r$  and  $P_{fr}$
- (f) Photosynthates partitioning and allocation

(2×3=6)

5. What is seed dormancy? Give the reasons for its occurrence and the ways to overcome it. What is the significance of dormancy? (1+4+1=6)

6. Write a detailed account of mechanisms of phloem loading. (6)

7. What is photoperiodism? Classify plants on the basis of their day length requirements for flowering. What is the role of phytochromes in this phenomenon?

(2+2+2=6)

P.T.O.

OR

Define pressure potential, osmotic potential and water potential. Indicate the relationship between them. What effect will an increase in the permeability of the cell membrane to solutes have on its water potential?

(2+2+2=6)

8. Discuss any **two** of the following :

(a) Mechanism of action of plant growth substances

(b) Secondary metabolites

(c) Theories on opening and closing of stomata

(d) Facilitated diffusion

(3×2=6)