

1 (Sem-6/FYUGP) BOT 61 MJ

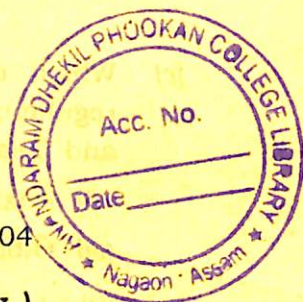
2026

BOTANY

(Major)

Paper : BOT0600104

(Plant Physiology)



Full Marks : 45

Time : 2 hours

*The figures in the margin indicate full marks
for the questions.*

1. Choose the correct answer from the options given below for the following : $1 \times 5 = 5$
- (a) Aquaporins are proteins that facilitate
- (i) active transport of water
 - (ii) passive transport of water
 - (iii) transport of ions
 - (iv) transport of sugars
- (b) Which type of transport occurs when mineral ions move along their concentration gradient?
- (i) Active transport
 - (ii) Facilitated diffusion
 - (iii) Passive transport
 - (iv) Osmosis

(2)

(c) Which of the following plant growth regulators promote(s) lateral bud growth and delays senescence?

- (i) Auxins (ii) Cytokinins
(iii) Gibberellins (iv) Absciscic acid

(d) Which form of phytochrome promotes flowering in long-day plants?

- (i) P₆₆₀ (Pr) (ii) P₇₃₀ (Pfr)
(iii) P₅₀₀ (iv) P₄₀₀

(e) The triple response of ethylene includes

- (i) increased cell elongation, thickening of the stem, and faster germination
(ii) stem elongation, leaf expansion, and increased photosynthesis
(iii) inhibition of stem elongation, thickening of the stem, and horizontal growth
(iv) root hair formation, vascular differentiation, and cell elongation

2. Write short notes on any *five* of the following : 2×5=10

- (a) Root pressure theory
(b) Anti-transpirants

(3)

(c) Chelating agents

(d) Antiport

(e) Phloem loading

(f) Absciscic acid

(g) Vernalization

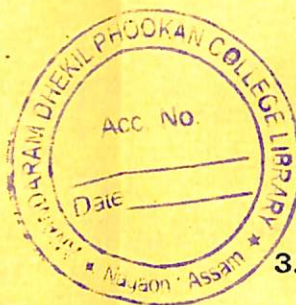
(h) Phytochrome

(i) Oxidative stress

(j) Reactive oxygen species

3. Answer briefly any *four* of the following questions : 5×4=20

- (a) Describe the apoplast and symplast pathways of water movement.
(b) Explain the cohesion-tension theory of ascent of sap in plants.
(c) Describe any two functions and deficiency symptoms of magnesium and potassium in plants.
(d) Explain the source-to-sink concept in phloem transport.
(e) What is the significance of the red and far-red light in phytochrome function?



- (f) What are growth retardants? How do they affect plant growth and development?
- (g) What is seed dormancy? Explain the methods of breaking seed dormancy.
- (h) Discuss heavy metal stress and the role of phytochelatins in detoxification.

4. Answer any *one* of the following questions : 10

(a) Define water potential. Explain its components and their significance in plant water relations. 2+8=10

(b) Describe the symptoms of deficiency of any three essential elements and their impact on plant growth and development. 10

(c) Describe the process of phloem translocation and explain the Pressure Flow Hypothesis with labeled diagram. 10

(d) Define photoperiodism and classify the plants based on their photoperiodic response. Explain its significance in plant growth and development. 7+3=10



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