

[This question paper contains 4 printed pages.]

Your Roll No.

5117

B

B.Sc. Prog./III

LS-301—Developmental Biology and Physiology

Time : 3 Hours

Maximum Marks : 75

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

Attempt *Five* questions in all.

Question No. 1 is compulsory.

1. Name the following : 10

- (a) (i) The hormone involved in bolting of rosette plants.
- (ii) An example of an obligate root parasite producing biggest flowers.
- (iii) A chemical that is a common, intermediate to both anaerobic and aerobic respiration.
- (iv) A gaseous hormone.
- (v) A nitrifying bacterium.
- (vi) Mineral element required for the synthesis of IAA.
- (vii) A hormone which is anti-transparent.
- (viii) A naturally occurring Cytokinin.

[P. T. O.]

- (ix) A product of cyclic electron transport of thylakoid membrane.
- (x) A relationship between two organisms where both are beneficial to each other.
- (b) Define (any five) : 5
- (i) Companion cell
 - (ii) Amphistomatic leaf
 - (iii) Chlorenchyma
 - (iv) Fibers
 - (v) Endarch xylem
 - (vi) Cork.
2. (a) Discuss the degradation of a molecule of glucose in Glycolysis (with flow chart). Mention the end products. 5
- (b) Explain the process of nodulation and role of enzyme dinitrogenase in symbiotic N_2 fixation. 5
- (c) Answer the following (any two). Make diagrams : 5
- (i) Types of stomata
 - (ii) Secondary growth in stem
 - (iii) Functions of parenchyma.

3. Differentiate between (any five) : 15
- (i) Transpiration and Guttation
 - (ii) Long-day plants and short-day plants
 - (iii) Carnivorous plants and Epiphytes
 - (iv) Water potential and osmotic potential
 - (v) Collenchyma and Aerenchyma
 - (vi) Tracheid and vessel
 - (vii) Annular and spiral thickening.
4. Discuss or write an explanatory note on any three : 15
- (i) C_4 pathway
 - (ii) Mechanism of opening and closing of stomata
 - (iii) Bulk flow hypothesis
 - (iv) Significance of apical meristems in plants
 - (v) Ammonia assimilation in plants.
5. (a) Discuss the light reactions of photosynthesis with 15 reference to (a) role of reaction center chlorophyll molecule, (b) Role of Ps I and Ps II.
- (b) Differentiate between the anatomical structure of *Helianthus* stem and *Zea maize* stem.

6. Write short notes on (any five) : 15
- (i) Substrate level phosphorylation
 - (ii) Physiological effects of GA_3
 - (iii) Phytochrome and their role
 - (iv) Hydroponics
 - (v) Root Cap
 - (vi) Transfer cells
 - (vii) Sclereids
 - (viii) Tunica-Corpus Theory.
7. (a) Mention the role of Rubisco. 15
- (b) Describe the structure of phloem with the help of labelled diagrams.
- (c) What are criteria for essentiality of nutrients in plants ?