This question paper contains **4** printed pages]

Roll No. | | | | | | | | | | |

S. No. of Question Paper : **8357**

Unique Paper Code : **LSPT-511 : 216553** **C**

Name of the Paper : **Developmental Biology and Physiology Plants**

Name of the Course : **B.Sc. (Life Sciences)**

Semester : **V**

Duration : **3 Hours** Maximum Marks : **75**

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

Instructions for Candidates :

This paper contains *six* questions. Attempt any *five* questions in all. *All* questions carry equal marks. Attempt all parts of a question together. Draw well labelled diagrams wherever necessary.

1. (*a*) Differentiate between any *two* :

   (*i*) SSI and GSI

   (*ii*) Exine and Intine

   (*iii*) Endothecium and Endothelium 2×2½

   (*b*) Write an explanatory note on the role of tapetum during microsporogenesis. 5

   (*c*) Discuss the structural and functional organization of the embryo sac. 5

2. (*a*) Draw well-labelled neat diagrams (any *two*) :

   (*i*) T.S. tetrasporangiate anther at spore mother cell stage

   (*ii*) L.S. anatropous and unitegmic ovule

   (*iii*) Ultrastructure of a synergid cell 2×2½

P.T.O.

(*b*) Give a brief account of double fertilization. What is its evolutionary significance ? 5

(*c*) Mention whether the given statement is True *or* False :

(*i*) The endothecial thickenings are predominantly made up of lignin.

(*iii*) A flower is regarded as modified shoot apex.

(*iii*) Pollination by bats is known as cheiropterophily.

(*iv*) The single cotyledon of monocot embryo is known as scutellum.

(*v*) Gametophytic phase is dominant stage in the life cycle of angiosperms. 5

3. Answer any *three* of the following :

(*a*) Fill in the blanks :

(*i*) Photooxidation of water is associated with _____.

(*ii*) First stable product of Calvin cycle is_____.

(*iii*) The ion involved in stomatal movement is _____.

(*iv*) _____is the mobile electron carrier in photosynthetic electron transport.

(*v*) _____is the mineral element essential for nitrogen metabolism. 5

(*b*) Depict schematically the photosynthetic electron transport system in the thylakoid membrane of chloroplast (no description is required) 5

(*c*) Describe the photorespiratory pathway. 5

(*d*) Mention the contributions of any *two* of the following scientists:

(*i*) C. B. Van Neil

(*ii*) R. Emerson

(*iii*) R. Hill 2×2½

4. Attempt any *three* parts :

(*a*) Explain the mechanism of ascent of water in a plant.

(*b*) Mention the role and deficiency symptoms of any *two* macronutrients.

(*c*) Explain the mechanism of stomatal movement.

(*d*) Describe the photosynthetic carbon reduction cycle (Calvin Cycle) 3×5

5. (*a*) Write brief notes on any *two* of the following :

(*i*) Florigen

(*ii*) Jasmonates

(*iii*) Phytochrome - mediated plant responses 2×2½

(*b*) Explain the pressure-flow hypothesis of phloem translocation. 5

(*c*) Describe GA_3-stimulated mobilization of nutrient reserves during seed germination.

Or

Discuss the physiological roles of cytokinins in plants 5

6. Answer any *three* of the following :

(*a*) Briefly describe the experiment(s)/observations that led to the discovery of photoperiodism.

(*b*) Write a note on 'photo-reversibility of phytochromes'.

(*c*) Define the terms : Biological clocks; Vernalization; Photomorphogenesis; Bioassay; Cryptochrome.

(*d*) Briefly discuss auxin-related apical dominance. 3×5