PG Odd Semester (CBCS) Exam., December—2018

LIFE SCIENCE AND BIOINFORMATICS

(3rd Semester)

Course No. : LSBCC–301

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Botany Students will answer Course No. : LSBCC–301 (B) and Zoology Students will answer Course No. : LSBCC–301 (Z)

GROUP—A

Course No. : LSBCC–301 (B)

(PLANT PHYSIOLOGY)

1. *(a)* What do you mean by adhesion and cohesion? With suitable model, describe the mechanism of transport of water by xylem. 2+7=9

(b) Differentiate between apoplastic and symplastic transport mechanism. What is the role of Casparian strip in water transport? 3+2=5

OR

2. *(a)* With a diagram, describe the structure of ATPase pump. Write its role in transport of ions. 5+2=7

(b) Discuss the role of ABA in stomatal opening and closing with model. 5

(c) What is aquaporin? 2

3. *(a)* What do you mean by action and absorption spectra? With suitable model, describe the structure of PS–I and PS–II. 3+4+4=11

(b) Add a note on photoinhibition. 3

OR

4. *(a)* Explain why C4 and CAM plants are more efficient than C3 plant in terms of photosynthetics yield. 4

(b) What is photorespiration? Discuss mechanism of photorespiration with reactions. Add a note on metabolic significance of photorespiration. 1+6+3=10

5. *(a)* With suitable model, explain the structure of nitrogenase enzyme. Discuss about the mechanism of electron transport within nitrogenase. 5+5=10

(b) Discuss about the process of nodulation in leguminous plants. 4

OR

6. *(a)* Discuss about plants' adaptive responses against water and salt stress with suitable model. 10

(b) Add a note on Heat Shock Protein (HSP). 4

7. Discuss the physiological importance and signal transduction pathway controlled by gibberellins. Add a note on DELLA protein. 5+6+3=14

OR

8. Write short notes on : 7×2=14

(a) Ethylene in stress control

(b) Transport of auxin

9. *(a)* What do you mean by phytochrome, cryptochrome and phototropin? 3

(b) Discuss the mechanism of phytochrome signalling. 7

(c) Explain how phytochrome helps in maintaining photoperiodic balance in plants. 4

OR

10. *(a)* Discuss about different check points for regulation of senescence in plants. 10

(b) Differentiate between Programmed Cell Death (PCD) and Necrotic Cell Death (NCD). 4

GROUP—B

Course No. : LSBCC–301 (Z)

(MOLECULAR ENDOCRINOLOGY)

1. Explain with suitable diagrams, the regulation of hormone synthesis with special reference to feedback mechanism. 14

OR

2. Write notes on the following : 7×2=14

(a) Chemical nature and hormone classification

(b) Neuroendocrine system in insects

3. Why is pituitary gland called master gland? Explain the physiological action of hormone secreted by pituitary gland. 4+10=14

OR

4. Write detailed notes on the following : 7×2=14

(a) Glucose homeostasis

(b) Thyroid hormone synthesis and regulation

5. Define G-protein. Describe with suitable diagram, two major G-protein mediated pathways. 14

OR

6. Write notes on the following : 7×2=14

(a) Second messenger

(b) Protein kinase A

7. Write a detailed note on artificial reproductive techniques. Explain *in vitro* fertilization. 14

OR

8. Write notes on the following : 7×2=14

(a) Contraception and family planning

(b) Male and female infertility

9. Describe endocrine disrupting chemicals. How are genetic analysis and clinical management beneficial in treating hormonal disorder? 14

OR

10. Write notes on the following : 7×2=14

(a) Significance of phytoestrogens

(b) Hormone production by DNA technologies

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