2018/ODD/09/26/LSB–304 (B)
(A/B/C)/063

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

LIFE SCIENCE AND BIOINFORMATICS

(3rd Semester)

Course No. : LSBCC–304 (B)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Candidates have to answer *either* from Group—A *or* Group—B *or* Group—C

GROUP—A

Course No. : LSBCC–304 (B) (A)

(TAXONOMY OF ANGIOSPERMS AND MEDICINAL PLANT STUDY)

Answer **five** questions, selecting **one** from each Unit

UNIT—I

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

(a) Indented key and its importance in identification of species

(b) Role of palynology in solving taxonomic problems

2. Write notes on the following : 3½×4=14

(a) Cauliflorous plants

(b) Achene fruit

(c) Nomenclature synonym

(d) Principles of priority

UNIT—II

3. Write a detailed note on the application of DNA markers in angiosperms taxonomy. Define OTU and cluster analysis. 12+2=14

4. Discuss morphological diversity and variation in the order Ericales (sensu. Cronquist, 1981). 14

UNIT—III

5. Discuss different methods of Ethnobotanical data collection. How are the data analyzed quantitatively? 6+8=14

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

(a) Nutraceuticals

(b) LD_{50} and ED_{50}

UNIT—IV

7. Write a brief note about the working principle of HPLC. With example, explain the application of HPLC in natural product chemistry. 5+9=14

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

(a) NMR and its application

(b) Biosynthesis of phenols

UNIT—V

9. *(a)* Define the term 'biopiracy' and discuss its implications. 4

(b) Define patents and discuss patenting regulations in India. 2+8=10

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

(a) Mode of action of antioxidants

(b) Molecular docking

GROUP—B

Course No. : LSBCC–304 (B) (B)

(PLANT BIOCHEMISTRY AND MOLECULAR BIOLOGY)

1. Elucidate the kinetics of unisubstrate enzyme catalyzed reaction and derive different plots from Michaelis-Menten equation. 14

OR

2. Write notes on any *two* of the following : 7×2=14

(a) Second law of thermodynamics

(b) Free energy

(c) ATP

3. Discuss the biosynthesis of fatty acid and its regulation. 14

OR

4. Write notes on any *two* of the following : 7×2=14

(a) Oxidative phosphorylation

(b) Biosynthesis of purines

(c) Starch synthesis

5. Discuss different methods of plant genetic engineering and raising of transgenics with examples. 14

OR

6. Write notes on any *two* of the following : 7×2=14

(a) Gene cloning

(b) Biosafety for transgenics

(c) Plant gene structure

7. What are the different sequencing methods used to sequence plant genes? Discuss with examples. 14

OR

8. Write notes on any *two* of the following : 7×2=14

(a) Transcriptomics

(b) Metabolomics

(c) Comparative genomics

9. What is signal transduction in plants? Discuss with at least one example. 14

OR

10. Write notes on any *two* of the following : 7×2=14

(a) Reactive oxygen species (ROS)

(b) Epigenetic memory

(c) Transporters

GROUP—C

Course No. : LSBCC–304 (B) (C)

(MICROBIAL BIOTECHNOLOGY)

1. *(a)* Discuss the features of bacterial ribosomal gene locus. 7

(b) How is the rDNA locus used in bacterial identification? 7

OR

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

(a) Features of microbes used in biotechnology

(b) IPR related to microbes

3. What is strain improvement? Discuss giving examples various methods of strain improvements. 3+11=14

OR

4. Related to protein expression in a host, discuss—

(a) advantages of eukaryotic host;

(b) features of an expression vector;

(c) protein purification strategies. 5+5+4=14

5. What are rhizospheric microbes? Explain how these microbes help the plants. 4+10=14

OR

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

(a) Therapeutic proteins produced in microbes

(b) Microbial antibiotics

7. Explain the process of different fuels produced by microbial system. 14

OR

8. *(a)* Discuss the chemical nature of a typical plant biomass.

(b) Explain the enzymes responsible for degradation of each component of plant biomass. 7+7=14

9. Describe different types of fermentation methods. Explain the advantages and disadvantages of solid-state fermentation. 10+4=14

OR

10. Discuss the microbial growth kinetics in batch and continuous fermentation process. 7+7=14

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