(b) Fusion Proteins 5

(c) Disadvantages 4

Or

4. In relation to Yeast expression system, write notes on the following:

(a) Pichia expression promoters 4

(b) Advantages of this system 5

(c) Examples of Expression vectors. 4

5. What are Plant growth promoting Rhizospheric (PGPR) Microbes? Illustrate giving examples the uses of PGPR microbes in agriculture. 14

Or

6. Write short notes on the following: 7x2=14

(a) Types of Mycorrhizae

(b) Lactam Antibiotics from microorganisms

7. What are probiotics, prebiotics and symbiotics. Discuss the clinical significance of these microorganisms and their applications. 8+6=14

Or

8. Write short notes on the following: 7x2=14

(a) Microbial Cellulose

(b) Microbial Xanthan

9. Discuss the features, applications and disadvantages of two bioreactors 7+7=14

Or

10. Write notes on the following: 7x2=14

(a) Compare Solid State Fermentation (SSF) with Submerged Fermentation (SMF)

(b) Applications and disadvantages of SSF.

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PG (CBCS) ODD SEMESTER EXAMINATION, 2022

LIFE SCIENCE & BIOINFORMATICS

3rd Semester

COURSE NO. LISBCC – 304(B)

(Special Paper)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

(Answer all questions from any one option)

Option A : (Microbial Ecology)

1. Discuss different classification studies in analyzing the diversity of microorganisms. 14

Or

2. Write short notes on any two of the following:

(a) Shanon index

(b) Growth curve

3. Describe anabolic and catabolic pathways in microbes. 14

Or

4. Write short notes on any two of the following: 7x2=14

(a) Colonization

(b) Succession and climax community

(c) Active and passive dispersal

(Turn Over)

5. Explain the role of microbes in bio-degradation of waste and pollutants. Illustrate the pathways operational in waste and pollutant degradation. 7+7=14

Or

6. How do microorganisms affect the soil fertility? Discuss major interactions between microorganisms and plants. 4+10=14

7. What are the bio-fertilizers and discuss their mode of action in agriculture. Describe different microbial biomass production methods. 7+7=14

Or

8. What are the major biogeochemical cycles? Discuss in role of microbes in nitrogen cycle. 4+10=14

9. Discuss various fingerprinting methods used in microbial diversity studies. 4+10=14

Or

10. Write short notes on any two of the following: 2x7=14

(a) Metagenomics and its applications

(b) Web resources for microbial study

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Option B : (Angiosperm Taxonomy, Biosystematics and Molecular Phylogenetics)

1. Write notes on the following: 7x=14

(a) Dichotomous Keys

(b) Cymose Inflorescence

Or

2. Write an elaborate note on the importance of embryological characters on solving taxonomic problems citing different examples. 14

(b) Discuss the role of secondary metabolites in drug discovery with examples. 7

7. What do you mean by biological databases? Add detail notes on GenBank, DDBJ and NCBI. 2+12=14

Or

8. (a) What do you mean by sequence alignment? Discuss different methods of sequence alignments with examples. 1+6=7

(b) What is phylogenetic tree? Write characteristic features of phylogenetic tree. 7

9. Write short notes on the following: 7x2=14

(a) QSAR

(b) Pharmacogenomics

Or

10. What do you mean by Computer Aided Drug Designing (CADD)? Discuss various steps of Computer Aided Drug Designing with suitable illustrations. 2+12=14

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Option D : (Microbial Biotechnology)

1. Write notes on the following: 7x2=14

(a) Microbial Fingerprinting

(b) Nested-Loop PCR

Or

2. Discuss how 16SrRNA gene sequencing is used for microbial identification. 14

3. In relation to bacterial expression system, discuss the following:

(a) Use of Promoters 4

(Turn Over)

10. Write notes on : 6+4+4=14
   (a) Maximum Likelihood Analysis
   (b) MEGA- Software
   (c) Plesiomorphic and apomorphic characters.

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Option C : (PhytoJchemistry and Computational Drug Designing)

1. What do you mean by Ethnobotany? Write about the role of ethnobotany in drug discovery with examples. 4+10=14

Or

2. Write notes on the following: 7x2=14
   (a) Crude drugs
   (b) Nutraceuticals

3. Describe the process of preparation of crude plant extracts. How analysis of extracts can be done quantitatively and qualitatively? 6+8=14

Or

4. Write working principles of following: 3.5x4=14
   (a) TLC
   (b) SPE
   (c) HPLC
   (d) NMR

5. Define and classify secondary metabolites. Discuss general scheme for biosynthesis of terpenes and phenolics. 4+10=14

Or

6. (a) "Secondary metabolites are equally important as primary metabolites in plants"-Justify. 7

3. Define with examples: 3.5x4=14
   (a) Later Homonym
   (b) Alternative name (*nom.alt.*)
   (c) Paratype
   (d) *nomen nudum*

Or

4. Write role of current activities of Botanical Survey of India (BSI) in the field of Plant Taxonomy. Write a note on Convention on Biological Diversity (CBD). 10+4=14

5. a) Write an account on ANITA Grade. 7
   b) Write down the importance of Angiosperm Phylogeny Group (APG IV, 2016) in the light of recent plant classification system. 7

Or

6. Compare morphological diversity between the families Apocynaceae and Asclepiadaceae.Justify the inclusion of Asclepiadaceae under Apocynaceae as per APG system. 8+6=14

7. Write notes on the following: 6+4+4=14
   (a) CITES
   (b) Invasive species
   (c) Paleo and neo-endemics

Or

8. What do you mean by biodiversity hot spots? Write an account on the floristic wealth and endemism in Indo-Burma Biodiversity Hotspot. 2+12=14

9. Write the role of AFLP marker in molecular systematic. Write a note on PCR amplification. 10+4=14

Or