বিদ্যাসাগর বিশ্ববিদ্যালয়
VIDYASAGAR UNIVERSITY

Question Paper

B.Sc. Honours Examinations 2021
(Under CBCS Pattern)
Semester - VI
Subject: BOTANY
Paper : DSE 3-T & P

Full Marks : 60 (Theory-40 + Practical-20)
Time : 3 Hours

Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

Industrial and Environmental Microbiology

[Theory]

Answer ***any two*** of the following: 2×15=30

1. What is fermentation? Differentiate between batch and continuous fermentation. Write a brief note on component and type of bioreactors. Write about some application of Tank fermenter and Tower fermenter. 2+4+6+3

2. What is biofertilizer? Write notes on significance of biofertilizer. Schematically describe the isolation of root nodulating bacteria. Name two nitrogen fixing cyanobacteria. Briefly describe the process of root nodule formation. 2+3+5+2+3

3. What is BOD? Differentiate between BOD and COD. Briefly describe the role of microbes in sewage and domestic waste water treatment system. Write a note on "Microorgansims as indicator of water quality". 2+4+4+5

4. Name two bacteria commonly found in air. Schematically describe the methodology of isolation of microorganisms from soil. Discuss in details the sanitary test for coliforms. What is the Most Probable Number (MPN)? 2+6+5+2

Answer ***any one*** of the following: 1×10=10

5. What is downstream processing? Write the applications of downstream processing. Name different types commercially produced enzymes and describe the process for manufacturing any one enzyme. 2+4+4

6. What is lyophilization? Name one microorganism used in citric acid production. What are the commercial uses of citric acid? Write note on Arbuscular mycorrhizal colonization in plant roots. 2+1+3+4

[Practical]

Answer ***any one*** of the following: 1×20=20

1. Mention different sterilization techniques of microbial culture media. 20

2. Write down the principle and uses of Auto clave and Laminar air Flow. 10+10

3. Mention working principle of incubator and shaker. What are different process for sanitization of a room? 10+10

Bioinformatics Theory

[Theory]

Answer ***any two*** of the following: 2×15=30

1. What is basic local alignment search tool (BLAST)? What are the uses of BLAST tool? What is BLAST algorithm? 4+6+5=15

2. Define DDBJ. Give a brief account of all the resources and data submission in DDBJ. Briefly describe the specialised tools and databases of NCBI. 3+6+6=15

3. How quantitative structure-activity relationship (QSAR) technique is applied in Drug Design? Write a short note on Biological databases. Give examples of database retrieval tools. 7+6+2=15

4. What is phylogenetic tree? What are the various methods for phylogenetic analysis? Give differences between NJ, MP and ML trees. 3+6+6=15

Answer ***any one*** of the following: 1×10=10

5. Differentiate between global and local alignments. Explain the various approaches used in multiple sequence alignment. 5+5=10

6. Briefly discuss the applications of bioinformatics in microbial genome manipulation and crop improvement. 5+5=10

[Practical]

Answer ***any one*** of the following: 1×20=20

1. What are the basic steps to be carried out to build a phylogenetic tree for a set of related sequences? Mention the different types of phylogenetic trees. 10+10=20

2. How can you infer similarity & identity from BLAST results? What is the interpretation of BLAST result by using e-value and bit score? 10+10=20

3. Mention the procedure for sequence retrieval from databases. What are the steps of multiple sequence alignment? 10+10=20