[This question paper contains 4 printed pages.]

Your Roll No. .....

Sr. No. of Question Paper : 3026 **H**

Unique Paper Code : 32167601

Name of the Paper : DSE-III (Industrial and Environmental Microbiology)

Name of the Course : **B.Sc. (Honours) Botany**

Semester : VI

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions in all.
3. Question no. **1** is compulsory.
4. All parts of a question must be answered together.
5. Draw well-labelled diagram wherever necessary.

1. (a) Define any **five** of the following : (5×1=5)

   (i) Extracellular enzymes

   (ii) Impeller

P.T.O.

(iii) Selective medium

(iv) Psychrotrophs

(v) Lyophilization

(vi) Eutrophication

(b) Expand the following **(any five)** : (5×1=5)

(i) ATCC

(ii) CFU

(iii) IMTECH

(iv) PDA

(v) TOC

(vi) GRAS

(c) Match the following : (5×1=5)

(i) Nitrification	(a) Charles Chamberland
(ii) Autoclave	(b) *Bacillus cereus*
(iii) Phosphate solubilizing microorganism	(c) *Zoogloea* sp.
(iv) Casein hydrolysis	(d) *Pseudomonas* sp.
(v) Trickling filter	(e) *Nitrosomonas* sp.

2. Write short notes on the following **(any three)** : (3×5=15)

(i) Factors affecting aeromicroflora

(ii) Bacterial growth curve

(iii) Role of microbes in industry

(iv) Cell Disruption

3. Differentiate between the following **(any three)** : (3×5=15)

(i) Batch fermentation and Continuous fermentation

(ii) Freeze drying and Spray drying

(iii) BOD and COD

(iv) Centrifugation and Filtration

4. (a) Briefly discuss different methods of enzyme immobilization. (8)

(b) What are HFCS? What is the industrial importance of immobilization of glucose isomerases? (7)

5. (a) Discuss in detail the industrial production of citric acid. (8)

(b) Describe different methods for isolating soil microorganisms. (7)

6. (a) What are total coliforms? Discuss evaluation methods **(any three)** for detecting coliforms in drinking water. (8)

(b) Discuss the primary and secondary methods for treatment of sewage water? (7)

7. (a) What is meant by up stream processing? Discuss the steps involved in up stream processing. (8)

(b) Explain the structure and working of fluidized bed reactor. (7)

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Your Roll No.....

Sr. No. of Question Paper : 3136 **H**

Unique Paper Code : 32167608

Name of the Paper : Bioinformatics

Name of the Course : **B.Sc. (H) Botany**

Semester : VI

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions in all.
3. Question No. **1** is compulsory.
4. **All** parts of the question must be answered together.

1. (a) Define the following (**any five**) : (5×1=5)

   (i) Ras Mol

   (ii) Scoring Matrix

   (iii) PubMed

   (iv) Metabolomics

   (v) Unrooted tree

   (vi) Phylogram

P.T.O.

(b) Expand of the following (**any five**) : (5×1=5)

(i) QSAR

(ii) NIH

(iii) MIAME

(iv) ORF

(v) ZINC

(vi) OTU

(c) Give an example of each : (5×1=5)

(i) Languages in bioinformatics.

(ii) Metabolic database.

(iii) Disease Database.

(iv) Chemical database.

(v) Protein structure Database.

2. Differentiate between the following (**any three**). (3×5=15)

(a) Genomics and Proteomics

(b) Bank IT and Sequin

(c) PAM and BLOSUM

(d) Monophyletic and Polyphyletic trees

(e) Global alignment and Local alignment

3. Write short notes on **(any three)** : (3×5=15)

(a) Salient features of Swiss-Prot

(b) Sequence file formats

(c) Next generation Sequencing

(d) Gene prediction methods

(e) Microbial genome applications

4. (a) Explain various approaches for Computer-aided drug designing and role of structural bioinformatics in drug discovery. (8)

(b) What do you understand by Bioinformatics? Discuss its applications, scope and limitations. (7)

5. (a) What do you understand from biological databases? Explain Primary, Secondary and Composite databases with suitable examples. (8)

(b) Elaborate various data submission and retrieval tools of NCBI and EMBL. (7)

6. (a) What is Sequence alignment? Explain Pairwise and multiple sequence alignment with its significance. (8)

(b) Comment on molecular phylogeny and give

comparative account of Maximum Parsimony, Maximum Livelihood and Neighbour Joining method of phylogenetic tree construction. (7)

7. (a) What is BLAST? With the help of schematic diagram, briefly explain the different types of BLAST. (8)

(b) Discuss different level of Protein structures and describe various methods for protein structure prediction and modelling. (7)

8. (a) Explain small molecule databases with suitable examples. (8)

(b) What is DDBJ? Give an account of various resources available at DDBJ. (7)