BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.SC. **SEMESTER : I**
BRANCH: BIOTECHNOLOGY **SESSION : MO/18**

SUBJECT: BT403 APPLIED MICROBIOLOGY

TIME: 3 HRS. **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Answer any **two** of the following: [5]
i. Illustrate the principle and significance of Flagella and Acid-fast staining
ii. Outline the salient features of Micrometry
iii. Identify any two molecular methods used for identification of microorganisms

Q.1(b) Answer any **one** of the following: [5]
i. Categorize and describe the physical characteristics considered in wastewater analysis
ii. Identify the techniques used for measurement of microbial growth
iii. Classify the types of culture media used for microbial growth

Q.2(a) i. Distinguish between Batch, continuous and fed-batch culture microbial systems [5]
ii. Identify the effect of temperature and pH on microbial growth

Q.2(b) Answer any **one** of the following: [5]
i. Classify the nutritional types of microorganisms
ii. Compare active transport and facilitated diffusion mechanism of nutrient uptake by microorganisms citing suitable example in each case

Q.3(a) Answer any **one** of the following: [5]
i. Identify the different secondary wastewater treatment processes
ii. What are 'indicator organisms'? Evaluate their role in bacteriological analysis of water

Q.3(b) Answer any **one** of the following: [5]
i. What is the importance of bioleaching? Classify the mechanisms involved in bioleaching citing suitable examples
ii. Define the term 'biodegradation'. Assess the significance of phytoremediation citing suitable examples

Q.4(a) Answer any **one** of the following: [5]
i) Classify Mycorrhizae and explain their role as biofertilizers
ii) Identify the fungal-derived compounds responsible for deterioration of agricultural products

Q.4(b) Answer the following: [5]
i. Categorize the major physical agents used in food preservation
ii. What are the features of single cell protein? Give suitable examples

Q.5(a) Answer any **two** of the following: [5]
i. Classify the four types of exotoxins citing suitable examples
ii. Determine the salient features of 'Pathogenicity islands'
iii. Categorize vaccines and explain their role to improve public health

Q.5(b) Answer the following: [5]
i. Classify the four most common patterns of viral infection
ii. Identify the general characteristics of antimicrobial drugs giving suitable examples

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