JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2023

M.Sc.-I Semester (Microbiology)

COURSE CODE (CREDITS): 20MS1MB311 (03) MAX. MARKS: 35

COURSE NAME: Environmental Microbiology

COURSE INSTRUCTORS: Ashok Kumar Nadda MAX. TIME: 2 Hours

Note: *(a) All questions are compulsory.*
(b) Marks are indicated against each question in square brackets.
(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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Section I

Q 1 Very short answer type questions

a) Can you provide examples of plants or organisms commonly used in the production of biofibers? **(Mark 1)**

b) Can you provide examples of algal species commonly used in water quality assessments?. **(Mark 1)**

c) What parameters are typically measured in air quality monitoring, and what are the major sources of air pollution? **(Mark 1)**

d) Provide examples of natural sources of bioadhesives, such as proteins and polysaccharides. **(Mark 1)**

e) What is Microbial Enhanced Oil Recovery (MEOR), and how does it differ from traditional oil recovery methods? **(Mark 1)**

Section II

Q 2 Provide examples of different types of bioindicators, such as plants, animals, and microorganisms.How do these bioindicators respond to changes in environmental conditions? **[Marks 3]**

Q 3 Can you provide examples of microorganisms that produce biosurfactants and the conditions that promote their production? **[Marks 3]**

Q 4 Discuss the role of various microorganisms in the fermentation processes leading to biohydrogen production. What are the potential applications of biohydrogen as a clean energy source? **[Marks 3]**

Q 5 Can you explain the key components of a biosensor and their roles in the sensing process? Describe different types of biosensors used in environmental monitoring. **[Marks 3]**

Q 6 Explain the methods used in the production of bioplastics, including bio-based synthesis and extraction from natural sources. **[Marks 3]**

Section III

Q 7 Assess the environmental impact of biolubricants, with a focus on biodegradability and potential reductions in pollution. Can you describe the components commonly found in biolubricants? **[Marks 3]**

Q 8 How do first-generation biofuels differ from second-generation biofuels in terms of feedstocks and production methods? Can you discuss the potential role of biofuels in mitigating climate change and reducing dependence on fossil fuels? **[Marks 4]**

Q 9 Explain how bacterial bioassays are employed in toxicity testing for environmental pollutants. What bacterial indicators are used to assess pollution levels in soil or water? **[Marks 4]**

Q10 Can you describe the fundamental mechanism behind bioluminescence in organisms? How do luciferases and luciferins contribute to the emission of light in bioluminescent organisms? **[Marks 4]**