

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2022

M.Sc.-III Semester (Microbiology)

COURSE CODE (CREDITS): 21MS1MB311

MAX. MARKS: 35

COURSE NAME: ENVIRONMENTAL MICROBIOLOGY

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

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Section I

Q1. Answer the following questions. Each question is carrying one mark only.

- a) Name the enzyme and its source used in delignification of biomass? **(Mark 1)**
- b) What are the bioadhesives and biolubricants? Mention their sources too. **(Mark 1)**
- c) Name the two microorganisms that are present in natural enteric fermentor. **(Mark 1)**
- d) The tiny water bacterium _____ secretes a sugary substance with an adhesive force of nearly five tons per square inch, this "glue" is one of nature's strongest. **(Mark 1)**
- e) Discuss the role of microbial arylsulphatases and urease in the soil or natural environment? **(Mark 1)**

Section II

Q 2 Discuss the role of white rot fungi in the production of biofuels and environmental remediation. Explain with the help of suitable examples? **(Marks 2.5)**

Q 3 Enlist the enzymes and their sources used in the biomass degradation. Explain with the help of suitable examples. What is the main goal of feedstock biomass? **(Marks 2.5)**

Q 4 Comment on the role and various advantages of the algae in environmental monitoring. **(Marks 2.5)**

Q 5 Describe the various biosensors that are used to detect harmful herbicides/pesticides in the terrestrial environment and harmful gaseous pollutants in the atmosphere? **(Marks 2.5)**

Q 6 What are the major pollution-induced peptides used in pollutant bioassays in animals and plants. **(Marks 2.5)**

Q 7 Highlight the importance of bioindicators and biomarkers to protect the environment. **(Marks 2.5)**

Q 8 Write an essay on the mechanism of the synthesis and usage of bioplastic in the various fields. What is the current status of bioplastic production in India? **(Marks 2.0)**

Section III

Q 9 How does the micronucleus test and sister chromatid test can be used in the environmental monitoring. Also, discuss the role of bioluminescence in the pollutants monitoring **(Marks 4)**

Q 10 Discuss the role of various microbial genera in the MEOR (Microbial enhanced oil recovery) process. How does the microbe can be used to increase oil recovery from deep wells? Explain with a labeled diagram. **(Marks 4)**

Q 11 With the help of a labeled diagram illustrate the various biological routes of bioethanol production along with examples of major microbial genera involved. Give examples of various biproducts formed during the ethanol production which inhibit its production. **(Marks 5)**

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