JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS- 2022

M.Sc.-III Semester (Microbiology)

COURSE CODE (CREDITS): **21MS1MB311** MAX. MARKS: 25

COURSE NAME: **ENVIRONMENTAL MICROBIOLOGY**

COURSE INSTRUCTORS: **Dr. Ashok Kumar Nadda** MAX. TIME: 1 Hour and 30 Minutes

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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) What are the electrogenic bacteria? Give two examples. **(Mark 1)**

b) Name the two microorganisms that help in the removal of radioactive waste. **(Mark 1)**

c) Two ecological groups of fungi are considered for bioremediation of heavy metals and hydrocarbons, are _____ and the _____.**(Mark 1)**

d) Which carbohydrate based polycationic biopolymer has been used extensively as adsorbents for the removal of heavy metals in wastewater? **(Mark 1)**

e) What are the phosphate mobilizing biofertilizers? Give examples. **(Mark 1)**

Section II

Q 2 Write a short note on the plant mediated removal of the heavy metals from soils. Name those plants that help in the removal of specific metals including Pb, Hg, Zn and petroleum hydrocarbon. **(Marks 2.5)**

Q 3 Microorganisms have been commercialized as biocontrol agents to prevent the development of diseases in the crop plants. Name the microorganisms that have been available as biocontrol agents and their mechanism of action on the plants. **(Marks 2.5)**

Q 4 Comment on the various advantages of the biofertilizers over the conventional fertilizers. Discuss the various types of biofertlizers with suitable examples. **(Marks 2.5)**

Q 5 Discuss the various microbial processes used by the microorganisms to remove the heavy metals pollutants from the environment. Explain with suitable examples. **(Marks 2.5)**

Section III

Q 6 Name the fungal agent that act as potent candidate to degrade the whole wood components. What are those characteristics that make the above mentioned fungi to effectively degrade the cellulosic biomass and its advantages? **(Marks 3)**

Q 7 Discuss the role of microorganisms in the production bioethanol from agriculture waste biomass. Explain diagrammatically. **(Marks 3)**

Q 8 Explain the various steps in the mode of action of *Bacillus thurengiensis* diagrammatically. Comment on the various criteria that decide the toxicity and action of the BT toxin onto specific genera of the insects. **(Marks 4)**