

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

M.Sc-IInd Semester (BT)

COURSE CODE (CREDITS): 20MSWBT232

MAX. MARKS: 35

COURSE NAME: Environmental Biotechnology

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

Q 1 Answer the following questions. Very short answer type questions.

- a) Give an example of a natural bioreactor that catalyzes the enteric fermentation or anaerobic digestion of cellulose rich biomass. [01 Mark]
- b) An organism or biological response that reveals the presence of the pollutants by the occurrence of typical symptoms or measurable responses is known as _____. [01 Mark].
- c) A unique type of association where alga and fungi living **symbiotically** and their growth and structure also indicate the quality of air in the environment is called as _____. [01 Marks]
- d) Enlist the various harmful effects of Arsenic on the human health that is considered as one of the major pollutant in the ground water recently [01 Marks]
- e) **Give the answer in context to following statement**
Bacillus thuringiensis is a
 - (1) Gram-positive or Gram negative bacterium?
 - (2) Spore-forming or non Spore-forming bacterium? [01 Marks]

Section -II

Answer the following questions. Short answer type questions.

Q 2 Energy is the primary need of any country that boost up the economy and sustainability of the industrial processes. Give your opinions on the various feedstocks available for the generation of bioenergy in India. [03 Marks]

Q 3 A variety of industrial products can be synthesized using Microbial fuels cells [MFC]. Give a brief account of electricigens and various products synthesized by MFC [03 Marks]

Q 4 Bio-based products can be alternatives for the chemically synthesized polymers and materials. What do you understand by bioadhesives and biolubricants. Discuss their origin sources and applications. [04 Marks]

Section –III

Answer the following questions. Long answer type questions.

Q 5 Microbial communities play an important role in the conversion of biomass into biofuels. Discuss the various microbial genera involved the biotransformation and biocatalysis of the cellulose based biomass into bioethanol. [05 Marks]

Q 6 Microbially enhanced oil recovery [MEOR] is a tertiary recovery approach that utilizes the application of microorganisms. How this approach is utilized in the oil recovery and what are various microbial genera involved in the MEOR? [05 Marks]

Q 7. Diagrammatically explain the various steps involved in the anaerobic digestion. What are the various microbial communities that plays a critical role in the [05 Marks]

Q 8 Plastic is one of the emerging pollutants that drastically affected the health of ecosystem. How can we overcome the use of synthetic plastic? Would bioplastic be an alternative for the same? If yes discuss the synthesis and advantages of the bioplastic. [3+2 Marks]