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Reg. No. :

Code No. : 5752

Sub. Code : ZMBE 21

(CBCS) DEGREE EXAMINATION, APRIL 2022

Second Semester

Microbiology

Elective — BIODEGRADATION AND
BIOREMEDIATION

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

Process of using natural bacteria in mining industry is known as

- (a) Biodegradation (b) Bio genomics
(c) Bioremediation (d) Bioleaching

Lignin can be degraded by

- (a) Green rot fungi (b) White rot fungi
(c) Black rot fungi (d) Pink rot fungi

Chlorella sp are widely used in the removal of

- (a) Organic waste (b) Hydrocarbon
(c) Heavy metals (d) All the above

Which polymer occur naturally

- (a) starch and nylon
(b) starch and cellulose
(c) proteins and nylon
(d) proteins and PVC

_____ is the end product of the breakdown of organic matter by earthworm.

- (a) Vermicompost (b) Vermicularia
(c) Manure (d) None of the above

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

- (a) What are the enzymes involved in degradation of hemicellulose? And what are the factors affecting hemicellulose degradation?

Or

- (b) Explain the distribution of microorganism in aquatic ecosystem.

3. "Superbug" is used to control the
(a) Water pollution (b) Oil pollution
(c) Air pollution (d) Noise pollution
4. Leaching is _____ of metals from ores.
(a) Extraction (b) Purification
(c) Solubilization (d) Tailing
5. The first step in the biodegradation of many contaminants
(a) Denitrification (b) Dehalogenation
(c) Decarboxylation (d) Transpeptidation
6. In the microorganisms that produce acids are used to solubilize desirable metals
(a) Bioremediation (b) Bioleaching
(c) Biodegradation (d) Bio acidification
7. Heavy metals of industrial effluents can be removed best by
(a) *Bacillus licheniformis*
(b) *Zooglea ramigera*
(c) *Aspergillus oryzae*
(d) All the above

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12. (a) Explain in detail about the subsurface degradation.

Or

- (b) Write down the microorganism involved in degradation of paper.

13. (a) What is biomagnifications? And explain the mechanism of removal of heavy metals.

Or

- (b) Narrate the steps involved in the precipitation of metal sulphides.

14. (a) What is bioreactor and how it is used for bioremediation process?

Or

- (b) What is the construction and priorities for bioremediation and explain in detail.

15. (a) Write down the mechanism of biodegradation hydrocarbons.

Or

- (b) What is bioplastic and narrate the advantage of using bioplastic.

Answer ALL questions, choosing either (a) or (b).

16. (a) What are the different zones of terrestrial ecosystem and explain the distribution of microbial population of terrestrial ecosystem.

Or

- (b) Explain in detail about degradation of cellulose by microorganism.

17. (a) Explain in detail about biodegradation of paints.

Or

- (b) Write in detail about the microorganism and mechanism involved in degradation of textiles.

18. (a) Write down the process of recovery of metal from ores.

Or

- (b) What is bioleaching and write down the microorganism involved in bioleaching process.

19. (a) What is insitu and existu bioremediation and write down their differences.

Or

- (b) What is bioaugmentation and explain about the application of bioaugmentation.

20. (a) Explain in detail about biodegradation of pesticides.

Or

- (b) What is vermicompost? Explain the mechanism and benefits of vermicompost.