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M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2021.

Second Semester

Microbiology

Elective — BIODEGRADATION AND
BIOREMEDIATION TECHNOLOGY

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The following influences deterioration of polymers
 - (a) Weather
 - (b) Radiation
 - (c) Temperature
 - (d) All the above

2. The use of living microorganisms to degrade environmental pollutants is called
 - (a) Micro remediation
 - (b) Nano remediation
 - (c) Bio remediation
 - (d) All of these

3. Which of the following bacterium is called as the “Superbug” that could clean up oil spills?
 - (a) *Bacillus subtilis*
 - (b) *Pseudomonas putido*
 - (c) *Pseudomonas denitrificans*
 - (d) *Bacillus denitrificans*

4. The addition of nitrate or sulphate fertilizers in the soil to facilitate the decomposition of crude oil by
 - (a) Indigenous bacteria only
 - (b) Exogenous bacteria only
 - (c) Both (a) and (b)
 - (d) None of the above

5. Micro organisms remove metals by
 - (a) Adsorption and complexation
 - (b) Adsorption and precipitation
 - (c) Adsorption and volatilization
 - (d) All of these

6. Which bacterium is capable of withstanding high doses of radiation?
- (a) *Staphylococcus aureus*
 - (b) *Deinococcus radiodurans*
 - (c) *Escherichia coli*
 - (d) *Saccharomyces cerevisiae*
7. Ex situ bioremediation involves the
- (a) Degradation of pollutants by microbes directly
 - (b) Removal of pollutants and collection at a place to facilitate microbial degradation
 - (c) Degradation of pollutants by genetically engineered microbes
 - (d) None of these
8. A biodegradable plastic developed by Biopak corporation Australia is
- (a) Biopol
 - (b) Pet
 - (c) Polyester
 - (d) PVC
9. Which one is true about Xenobiotics?
- (a) Man made compound
 - (b) Derivatives of heavy metals
 - (c) Microbial compound
 - (d) Both (a) and (b)

10. _____ is the end product of the breakdown of organic matter by earth worm.
- (a) Vermicast
 - (b) Vermicularia
 - (c) Manure
 - (d) None of the above

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Explain the biodegradation of cellulose and hemicelluloses.

Or

- (b) Write about the biodegradation in aquatic ecosystem.

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

Or

- (b) What are the methods involved in enhancement of biodegradation?

13. (a) List out the microorganism used in leaching with example.

Or

- (b) Write about the tests for biodegradability.

14. (a) Write about xenobiotics.

Or

- (b) Explain about bioreactors.

15. (a) Name few ecofriendly biodegradable products, Give short notes on each.

Or

- (b) Discuss about bioplastics.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Write a detailed essay oil biodegradation in different ecosystems.

Or

- (b) Explain the biodegradation of natural polymers.

17. (a) Explain enhancement of biodegradation.

Or

(b) Write in detail about the microbial treatment of crude oil.

18. (a) Explain the types of bioleaching and write note oil copper leaching.

Or

(b) How will you precipitate metal sulphides from effluents?

19. (a) Differentiate insitue and exsitu bioremediation with examples.

Or

(b) Explain the process and uses of bioagumentation.

20. (a) Write about biodegradation of xenobiotics.

Or

(b) Explain the role of bioreactors for bioremediation process.