

(7 pages)

Reg. No. :

Code No. : 6510

Sub. Code : ZMBE 21

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 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 :

1. What is the drawback of biodegradable polymers?
 - (a) Fast oxidation
 - (b) Slow process-ability
 - (c) Brittleness
 - (d) Strength

2. Which of the following bacterium is called as the superbug that could clean up oil spills
 - (a) Bacillus subtilis
 - (b) Pseudomonas putida
 - (c) Pseudomonas denitrificans
 - (d) Bacillus denitrificans
3. Which of the following heavy metal is/are not absorbed by organisms?
 - (a) Cadmium
 - (b) Lead
 - (c) Both lead and cadmium
 - (d) None of the above
4. Microbial ecology is
 - (a) The study of practical uses of microbes in industry
 - (b) The study of microorganisms in the laboratory
 - (c) The study of microbes in their natural habitat
 - (d) The release of genetically recombined microbes

5. Which of the following is the most common bacteria used for bioleaching?

- (a) Spirillum
- (b) Coccus
- (c) Bacillus
- (d) Streptococcus

6. Chlorella sp are widely used in the removal of

- (a) Organic wastes
- (b) Hydrocarbons
- (c) Heavy metals
- (d) All of these

7. A process using microbes to convert toxic industrial wastes to less toxic or non-toxic compounds is

- (a) Precipitation
- (b) Complement fixation
- (c) Bioconversion
- (d) Bioremediation

8. Which of the following needs archaea to degrade a contaminant?

- (a) Bio augmentation
- (b) Accumulation
- (c) Sterilization
- (d) Pasteurization

9. Which of the following fungi is not known to degrade DDT insecticide?

- (a) Aspergillus niger
- (b) Mucor alternans
- (c) Penicillium sp
- (d) Bacillus cereus

10. Which of the following is a commonly used earthworm species for the vermicomposting process?

- (a) Eisenia fetida
- (b) Perionyx excavatus
- (c) Both (a) and (b)
- (d) None of the above

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Discuss the role of microbes in natural polymers.
- Or
- (b) Explain the basic difference between aquatic and terrestrial ecosystem.
12. (a) Write notes on oil spill degradation by microorganisms.
- Or
- (b) Briefly explain how paints are bio deteriorated.
13. (a) Explain how DDT becomes concentrated as it passes through a food chain.
- Or
- (b) Explain the process of bio mining.
14. (a) Difference between insitu and exsitu bioremediation.
- Or
- (b) Explain the case histories of bioremediation.

15. (a) Explain Herbicide and Pesticide degradation.

Or

- (b) Explain activated sludge process.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Give a detail account on microbial degradation of lignin and hemicellulose.
- Or
- (b) Describe the heterotrophic microbial population in arid ecosystem.
17. (a) Explain the microbial degradation of metal and concrete.
- Or
- (b) Explain the sub-surface degradation.
18. (a) Explain the removal of heavy metals and radionucleoide from effluents.
- Or
- (b) Write detail notes on testing for biodegradability.

19. (a) Explain the use of bioreactors in bioremediation process.

Or

(b) Write a brief note on types of bioremediation.

20. (a) Explain the treatment of solid and liquid waste.

Or

(b) Write a brief note on vermicomposting.
