(6 pages) Reg. No. : .....

Code No. : 7196 **Sub. Code : PMBE 26**

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2018.

Second Semester

Microbiology

Elective — BIODEGRADATION AND BIOREMIDIATION 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. Which of the following is not required for the biodegradation process?

   (a) Microorganisms

   (b) Adhesives

   (c) Environmental conditions

   (d) Substrate

2. Greater the hydrophilicity of the polymer, is the _____ rate of biodegradation.

   (a) Larger (b) Smaller

   (c) Medium (d) Equal

3. Which of the following is not an example of natural biodegradable polymer

   (a) Collagen (b) Polyvinyl alcohol

   (c) Lignin (d) Natural rubber

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. The first step in the bio degradation of many contaminants

   (a) Denitrification (b) Dehalogenation

   (c) Decarboxylation (d) Transpeptidation

6. In ———— microorganisms that produce acids are used to solubilize desirable metals.

(a) Bioremediation (b) Bioleaching

(c) Biodegradation (d) Bioacidification

7. A major organisms used in commercial bioleaching for copper recovery is

(a) *Pseudomonas aeruginosa*

(b) *Thiobacillus ferrooxidans*

(c) *Desulfovibrio desulfuricans*

(d) *Aspergillus niger*

8. Which one of the following species of earthworm is not recommended for vermicomposting

(a) *Eudrilus eugeniar*

(b) *Pheretima posthuma*

(c) *Eisenia fetida*

(d) *Perionyx excavatus*

9. Sulfration is an important method of toxification of foreign compounds, which of the following acts as a source of sulfate?

(a) Sulphuric acid (b) Phospho sulfate

(c) Hydrogen sulphide (d) Methionine

10. DDT should be

(a) dichloro – diphenyl trichloroethane

(b) dichloro – diphenyl dichloroethane

(c) dichlorino – triammonium methane

(d) difluoro – diphenyl tribromobutane

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 basic difference between aquatic and terrestrial ecosystem in degradation.

Or

(b) Write about the degradation of hemicellulose.

12. (a) Comment on microbial degradation of textiles and leather goods.

Or

(b) Write about the subsurface degradation.

13. (a) Explain how bacteria leach metal from ores.

Or

(b) Explain biosorption. Name the bacteria which are responsible for biosorption.

14. (a) Write about the case histories of bioremidiation.

Or

(b) Disadvantages of exsitu bioremidiation.

15. (a) Explain activated sludge process.

Or

(b) Name the microorganisms with biodegradation potential.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Explain the degradation of natural polymer.

Or

(b) Write in detail about how the microorganisms take place degradation in aquatic ecosystem.

17. (a) Write about the stimulation of oil spills for degradation.

Or

(b) Explain the microbial degradation of metals and concrete.

18. (a) Write about bio magnification and explain how DDT becomes pass through a food chain.

Or

(b) Discuss about the precipitation of metal sulfides.

19. (a) Explain the difference between insitu and exsitu bioremidiation.

Or

(b) Write about the advantages of bioaugmentation have been demonstrated in a number of cases.

20. (a) Explain how the liquid and solid waste treated from industry.

Or

(b) Write in detail about vermicomposting.

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