LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **BIOTECHNOLOGY**

SECOND SEMESTER – **APRIL 2016**

BT 2826 – ENVIRONMENTAL BIOTECHNOLOGY

Date: 25-04-2016 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

PART – A (20 Marks)
Answer all the questions

I Choose the correct answer: (5 x 1 = 5 Marks)

1. The greenhouse gases includes
   a) CO2 b) CH4 c) N2O d) All of these
2. Which of the following treatment removes phosphates and nitrates from sewage?
   a) primary b) secondary c) tertiary d) digester
3. Bioventing is used for degradation of
   a) inorganic matter b) carbons c) aerobically degradable compounds d) plastics
4. Source of β glucosidase biomarker
   a) *Pyrococcus* b) *Vibrio* c) *Pseudomonas* d) *Salmonella*
5. Which of the following can be seen in marine environment?
   a) halophile b) psychrophile c)barophile d) all the above

II State whether the following are true or false, if false, give reason (5 x 1= 5 Marks)

6. Trophosphere is characterized by heavy load of microorganisms.
7. Low growth rate and low substrate concentration favour flocculation during activated sludge process.
8. Actinomycetes have a higher capacity to bind metal ions when compared to fungi and bacteria.
9. Nitrification and denitrification are the important anaerobic reactions in sewage treatment.
10. Energy and carbon enter the ecosystem through photosynthesis.

III Complete the following: (5 x 1 = 5 Marks)

11. The study of flora of lakes and ponds is referred to as _____.
12. Carbon is present in atmosphere mainly in the form of _____.
13. Bioremediation by plants is called _____.
14. Organisms which survive in high temperature are called _____.
15. Widely used coagulant in water treatment _____.

IV Answer the following, each within 50 words only (5 x 1 = 5 Marks)

16. What is algal bloom?
17. What is breakpoint chlorination?
18. What is phycoremediation?
19. What is bulking?
20. Mention the advantages of composting?

PART – B

Answer the following, each within 500 words.
Draw diagrams wherever necessary. **(5×8 = 40 Marks)**

21. (a) Write briefly on carbon cycle.

OR

(b) Discuss the different types of symbiotic associations between microbes and other organisms.

22. (a) Write briefly on the structure and development of biofilm.

OR

(b) Give an account of the different types of aquatic ecosystem.

23. (a) Discuss the mechanism of biodegradation of oil spills by microorganisms.

OR

(b) Discuss the use of genetically engineered bacterial strains for bioremediation.

24. (a) Write briefly on the types of recalcitrant Xenobiotic compounds.

OR

(b) Explain the different methods of effluent treatment from the sugar industry.

25. (a) Give a brief account of *Deinococcus radiodurans* and its impact on the environment.

OR

(b) Write briefly on the mechanism of bioleaching of Copper and Uranium.

PART – C **(2×20 = 40 marks)**

Answer any TWO of the following, each within 1500 words. Draw diagrams wherever necessary

26. What is nitrogen fixation? Describe in detail the biogeochemical cycling of nitrogen.

27. Explain in detail the biological treatment of wastewater.

28. Give a detailed account on *insitu* and *exsitu* bioremediation.

29. Write in detail on the characterization of dye effluent and its treatment technologies.

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