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**SARDAR PATEL UNIVERSITY**

**M. Sc. Integrated Biotechnology, Eight Semester Examination**

**Tuesday, 28-04-2015**

**PS08CIGIB4: Biodegradation and Bioremediation**

**TIME: 02:30 p.m. to 05:30 pm**

**Marks: 70**

**Q.1 Attempt the followings 08**

- 1 Anaerobic degradation processes are  
a. Efficient b. Inefficient c. Costly d. Generating large biomass
- 2 Prime aim of biodegradation is  
a. BOD removal b. COD removal c. only a d. Both a and b
- 3 Beta oxidation of pesticides aliphatic side chain is hampered by  
a. Oxygen b. Carbon Dioxide c. extensive branching d. least branching
- 4 Dealkylation process removes \_\_\_\_\_ from pesticide  
a. Hydroxyl group b. Carboxyl group c. Methyl group d. water
- 5 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
- 6 Which of the following microbes (fungi) is widely used in the removal of industrial waste  
a. *Trichoderma* sp. b. *Aspergillus niger* c. *Pseudomonas putida* d. All
- 7 High hydrophilic lipophilic balance surfactants are soluble in  
a. Water b. Fat c. Organic solvents d. None
- 8 Find the correct sequence for the working of Sequencing batch reactor  
a. Fill, decant, treat, settle b. Fill, treat, decant, settle c. Fill, settle, treat & decant d. Fill, treat, settle & decant

**Q.2 Answer in brief (Any seven) 14**

- 1 Enlist characteristics of anaerobic bacteria as degraders of organics
- 2 Beta oxidation of odd numbered aliphatic chain
- 3 Write briefly O-dealkylation process
- 4 Properties of PCBs
- 5 Giving examples define recalcitrant.
- 6 What is rhizofiltration?
- 7 Discuss the significance of biosurfactants in bioremediation.
- 8 Differentiate between biofilter and biotrickling filter

**Q.3 A Give an account on role of oxygenase enzymes in aerobic degradation of aromatic and aliphatic hydrocarbons. 06**

**B Explain degradation of N-alkyl and S-alkyl compound in anaerobic conditions. 06**

**OR**

**B Explain degradation of aromatic hydrocarbons under aerobic conditions. 06**

- Q.4 A Write a note on Halogen reaction. 06  
B Briefly write on : 06  
1. Halogen reactions  
2. Dealkylation reaction
- OR**
- B Give an account on mechanism and factors that involved in wood decay. 06
- Q.5 A Write a note on biopile technique. 06  
B Discuss the limitations of *in-situ* bioremediation technique. 06
- OR**
- B Explain various ex-situ bioremediation methods in brief 06
- Q.6 A Elaborate various strategies used to enhanced processes of 06  
Bioremediation.  
B What is biofilter? Discuss the mechanism of bioremediation by using 06  
biofilter.
- OR**
- B Giving suitable example, discuss the role of genetically engineered 06  
microorganism in bioremediation of branched aromatic hydrocarbon  
and chlorobenzene.

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