

SARDAR PATEL UNIVERSITY

SC

M. Sc. Integrated Biotechnology, Eight Semester Examination

Tuesday, 28-04-2015

PS08CIGEB4: 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 Bioremediation. 06

- B What is biofilter? Discuss the mechanism of bioremediation by using biofilter. 06

OR

- B Giving suitable example, discuss the role of genetically engineered microorganism in bioremediation of branched aromatic hydrocarbon and chlorobenzene. 06