

(A-15)

SARDAR PATEL UNIVERSITY**M. Sc. -Integrated Biotechnology – Eight Semester Examination****Wednesday, 19th April 2017****Time: 10:00 am to 01:00 pm****PS08CIGIB4: Biodegradation and Bioremediation****Total Marks – 70****Q.1 Mark the right answer of following questions.****[08]**

1. Filter bed medium of bio-filter is made up of _____.
a. Compost b. Peat c. Soil d. All of these
2. Which of the gas is generated during incineration of waste gas?
a. Dioxins b. SO_x c. Dioxenins d. NO_x e. CO_x f. None of these
3. In anaerobic biodegradation of aromatic compounds the added oxygen is from _____.
a. CO₂ b. NO₂ c. H₂O d. NO_x e. O₂ f. None of these
4. Which compounds degrade faster than alkane?
a. Alkene & alkynes b. Chlorinated aromatic c. PAHs d. Alkenes & aromatic
5. What happens at each chlorination step?
a. Chlorine not released, H⁺ & protons required c. Chlorine released, H⁺ & protons required
b. Chlorine released, H⁺ & electrons required d. None of these
6. What do you consider to be the most important factor affecting bioremediation?
a. pH b. Oxygen c. Nutrients d. Microorganisms e. Temperature
7. β – oxidation of fatty acids _____.
a. Involves production of acetyl coA c. Feeds in to the TCA cycle
b. Does not produce ATP d. All of this
8. Which of the following is the non-ionic surfactant?
a. Lecithin b. Triton X-100 c. SDS d. Quaternary ammonium salt

Q.2 Answer the following questions. (ANY SEVEN OUT OF NINE)**[14]**

1. Write cyclohexane degradation pathway.
2. Write advantages and disadvantages of bioremediation.
3. Write examples of microbes and different anaerobic conditions for toluene degradation.
4. Discuss types and role of bio-surfactants in bioremediation.
5. Explain bio-augmentation with suitable examples
6. What are the applications of chlorinated alkanes?
7. What do you understand by microbial community of bio-filter?
8. What are the applications of chlorinated alkanes?
9. Define xenobiotic compounds. Write typical features recalcitrance compound.

- Q.3** A. Give an account on factors affecting biodegradation process. [06]
B. Write notes on: 1) Determination of biodegradability [06]
2) Pathway of n-alkane degradation
- OR**
- B. Which organic pollutants do produce catechol as one of the intermediate? Outline the steps of catechol degradation pathway. [06]
- Q.4** A. Illustrate microbial transformation processes of pesticides by oxidative dealkylation and hydrolysis. [06]
B. What is 2,4,5-T? Discuss various steps of 2,4,5-T degradation. [06]
- OR**
- B. Write notes on: 1) β – oxidation process [06]
2) Different degradation pathways of carbon tetrachloride
- Q.5** A. Explain the *Ex-Situ* bioremediation techniques in detail. [06]
B. Describe the advantages and disadvantages of *in-situ* bioremediation processes. [06]
- OR**
- B. What is bio-reactor? Discuss the role of aqueous reactors used in bioremediation with suitable example. [06]
- Q.6** A. Discuss the role of molecular techniques used in bioremediation of branched aromatic hydrocarbons. [06]
B. How contaminants in gas phase is degraded by bio-scrubber and membrane bioreactor. [06]
- OR**
- B. Write a note on microbial ecology of bio-filters. [06]

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