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SEAT No._____ No. of Printed Pages: 02

[69]

Sardar Patel University

M. Sc. Int. Biotechnology, Eighth Semester Examination

Thursday, 19th April, 2018

02:00 p.m. – 05:00 p.m.

***PS08CIGIB4*: Biodegradation and Bioremediation**

Note:

1. Figures to the right indicate marks.
2. Draw neat and labeled diagram, wherever necessary. Total Marks: 70

Q-1 Attempt the followings [08 X 01 =08]

1. Because of the low reactivity of which bonds, either aliphatic or aromatic, hydrocarbons are usually hard to degrade biologically?
   a) C-C b) C-H c) C=O d) None
2. _____ branching of compound leads to easy biodegradability.
   a) More b) Less c) Moderate d) None
3. What is meant by Halogenation?
   a) Introduction of Halogen atom
   b) Removal of Halogen atom
   c) Introduction & Removal of Halogen atom
   d) None of the mentioned
4. The term persistence of a pollutant in the environment refers to the__.
   a) Concentration of the pollutant in the environment.
   b) Distance a pollutant spreads in the environment in a given time.
   c) Length of time required to disappear from the environment
   d) Measure of the harm which can cause to humans
5. Which of the following are most commonly used hydrophilic groups in anionic surfactants?
   a) Carboxylates b) Sulphates c) Phosphate d) All of these
6. _____ states that "Increasing liquid phase concentration will always increase the amount of contaminant absorbed".
   a) Freundlich model b) Langmuir model
   c) Monad relationship d) Michaelis-Menten equation
7. The organic sulfide is treated very fast by which organisms?
   a) Algae b) Fungi c) Bacteria d) All of these
8. Which of the following engineered strain is used to remove PCB
   a) *E. coli* b) *Pseudomonas* sp. c) *C. testosteroni* d)None

Q-2 Answer the following questions (**Any seven**). [07 X 02 = 14]

i. Briefly explain anaerobic bacteria degradation of S-alkyl compounds.
ii. Write cyclohexane degradation pathway.
iii. What is epoxidation? Give its suitable example.
iv. Write steps of 2,4 D degradation.
v. Which key initial attacks are reported for alkene compounds degradation?
vi. Justify the use of Aqueous reactors in bioremediation.
vii. Give advantages and disadvantages of bioremediation.
viii. What is synthetic media?
ix. Differentiate activities of typical aerobic and anaerobic bacteria.

C.R.T.O.)

Q-3	(A)	Which enzymes are mainly involved in hydrocarbon degradation? Describe n-alkane and n-alkene degradation pathways.	[06]
	(B)	Give a brief account on aerobic degradation of aromatic compounds	[06]
		OR	
	(B)	Which parameters are used to measure biodegradability? Give an account on factors affecting biodegradation.	[06]
Q-4	(A)	Give a brief account on Wood degradation and its mechanism.	[06]
	(B)	Explain N-dealkylation and C-dealkylation reaction in brief.	[06]
		OR	
	(B)	Explain dealkylation, hydrolysis and decrboxylation reactions of pesticide degradation with appropriate examples.	[06]
Q5	(A)	Give an brief account on Bioremediation strategies.	[06]
	(B)	Write short notes on: i) Composting ii) Biopile technology	[06]
		OR	
	(B)	Elaborate the characteristics and properties of surfactants used for bioremediation purpose.	[06]
Q6	(A)	Explain microbial ecology of biofilters in brief.	[06]
	(B)	How membrane system is used to remove the air pollution? Explain.	[06]
		OR	
	(B)	What are the principle approaches to genetically engineered microorganism's development for bioremediation? Discuss any one with suitable example.	[06]

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