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SEAT No. _____

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SARDAR PATEL UNIVERSITY
M. Sc. -Integrated Biotechnology – Eighth Semester Examination
Wednesday, 27th March 2019
Time: 02:00 pm to 05:00 pm
PS08CIGEB4: Biodegradation and Bioremediation

Total Marks – 70 [08]

- Q.1 Mark the right answer of following questions.
- Artificial inoculation is required for degradation of _____ compounds.
 - Very easily degradable
 - Easily degradable
 - Potentially degradable
 - Non-biodegradable
 - Methane monooxygenase is commonly involved in degradation of _____ n-alkanes.
 - C₁-C₈
 - C₅-C₁₆
 - C₁₀-C₃₀
 - C₁₀-C₁₆
 - >C₂₅-C₃₀
 - _____ compound is used to increase insecticidal properties of DDT and organophosphorus pesticides.
 - PAHs
 - Chlorinated alkanes
 - 2,4-D
 - PCB
 - BTEX
 - _____ transformation process is involved in griseofulvin degradation.
 - N-dealkylation
 - O-dealkylation
 - C-dealkylation
 - S-dealkylation
 - Bioaugmentation is the process that involves: _____.
 - Using plants
 - Addition of microbes
 - In-situ* bioremediation
 - sludge removal
 - b & c
 - The process converting environmental pollutants in to harmless products by naturally occurring microbes is called _____.
 - Intrinsic bioremediation
 - Extrinsic bioremediation
 - Biosparging
 - Phytoremediation
 - In _____ technique of phytoremediation, pollutants store in shoots of plants.
 - Phyostimulation
 - Phytodegradation
 - Phytotransformation
 - Phytoextraction
 - _____ type of biosurfactant is generally produced by *Pseudomonas spp.*
 - Trehalolipids
 - Lipopeptides
 - Rhamnolipids
 - Sophorolipids
 - Phospholipids

- Q.2 Answer the following questions. (ANY SEVEN OUT OF NINE) [14]
- Describe the role of hydrolysis in pesticide transformations.
 - Write principles of aerobic degradation.
 - Mention degradation pathway of ethylbenzene to benzoyl-CoA.
 - Write applications and sources of chlorinated alkanes.
 - What are the advantages and disadvantages of biofiltration used for removal of air pollutants?
 - Differentiate *in-situ* and *ex-situ* bioremediation processes.
 - Write initial transformation processes of PCBs.
 - What are the advantages of phytoremediation process?
 - Write mechanism of biofiltration process.

①

(P.T.O.)

- Q.3 A. Define xenobiotic compounds. Explain determination of biodegradability and factors affecting hydrocarbon degradation. [06]
B. Enlist categories of aromatic compounds. Describe any two degradation pathways of toluene. [06]
- OR
- B. Write short notes on: 1) Anaerobic metabolism of lipids. [03]
2) Degradation of 2,4,5 T [03]
- Q.4 A. Explain β -oxidation cycle. Discuss involvement of β -oxidation in pesticide transformation with appropriate examples. [06]
B. Mention some of the facts of chloroalkanes degradations. Write degradation pathways of PCA and CCl_4 . [06]
- OR
- B. Illustrate oxidative dealkylation of pesticide with suitable examples. [06]
- Q.5 A. Define bioremediation. Discuss different *ex-situ* bioremediation technologies in detail. [06]
B. Write a note on various techniques of phytoremediation used for the treatment of contaminated soil. [06]
- OR
- B. Summarize different methods of *in-situ* bioremediation. [06]
- Q.6 A. Describe special features, strategies and factors of bioremediation. [06]
B. Explain the role of biosurfactants in biodegradation process in detail. [06]
- OR
- B. Write a note on methods used for immobilization of microbial cells. [06]

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