



UNIVERSITY OF THE PUNJAB

Seventh Semester – 2019

Examination: B.S. 4 Years Program

Roll No. in Fig.

Roll No. in Words.

PAPER: Biodegradation and Bioremediation
Course Code: BOT-407 Part-I (Compulsory)

MAX. TIME: 15 Min.
MAX. MARKS: 10

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Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer, cutting and overwriting is not allowed. (1x10=10)

1. The use of microorganisms to degrade environmental pollutants is known as:
A. Biostimulation
B. Bioremediation
C. Biotransformation
D. All of these
2. Microorganisms remove metals by
A. Adsorption
B. Formation of new compounds
C. Complexion
D. All of these
3. Which cleanup approach involves removing groundwater or soil from its natural setting to allow for bioremediation?
A) In situ bioremediation
B) Ex situ bioremediation
C) Bioaugmentation
D) Phytoremediation
4. Which of the following waste water treatments is most likely to produce carcinogens as a byproduct?
A. Chlorination
B. Ultraviolet light (UV)
C. Sand filtration
D. Carbon filtration
5. The enzyme nitrogenase is produced by n:
A. Pathogenic bacteria
B. Anaerobic bacteria
C. Cyanobacteria
D. Both B&C
6. A major organism used in commercial bioleaching for copper recovery is:
A. *Desulfovibrio desulfuricans*
B. *Pseudomonas aeruginosa*
C. *Aspergillus niger*
D. *Thiobacillus ferrooxidans*
7. Organophosphate pesticides can be detoxified by which enzymes of microbes.
A. Reductase
B. Oxidases
C. Hydrolases
D. Oxygenases
8. Identification of the sequence of genes in a chromosome is known as:
A. Gene mapping
B. Karyotype
C. Gene coding
D. Gene linkage
9. Anaerobic bacteria often play important roles in bioremediation. Which of the following is not an electron acceptor used by anaerobes during biodegradation reactions?
A. CO₂
B. NO₃⁻
C. Fe (III)
D. H₂O
10. During which stage of wastewater treatment is the primary effluent aerated to allow for biodegradation by aerobic microbes?
A. Sedimentation
B. Secondary treatment
C. Sludge digestion
D. Disinfection
E. Primary treatment



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Roll No.

PAPER: Biodegradation and Bioremediation
Course Code: BOT-407 Part – II

MAX. TIME: 2 Hrs. 45 Min.
MAX. MARKS: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Explain the following with examples.

(10x2=20)

1. What do you mean by organotrophic bacteria?
2. Write down the basic requirements for bacterial growth during Bioremediation?
3. Describe the Process of Sorption and its Effects on Biodegradation.
4. Describe the Role of Co-metabolism in Bioremediation
5. What is ACTIVATION? Enlist mechanisms involve in ACTIVATION.
6. What is meant by detoxification? Enlist mechanisms may involve in detoxification.
7. Describe the process of sorption and its effect on biodegradation.
8. Describe the Effects of Heavy Metals on Environment?
9. What is meant by bioreactor-based method of bioremediation?
10. What is detoxification? Enlist mechanisms may involve in detoxification.

Q.3. Questions with brief answers

(6x5=30)

- i. (a) Write a note on anthropogenic impact on environmental pollution? (05 Marks)
(b) What is the role of Genetic modification for bioremediation process? (05 Marks)
- ii. (a) Define Xenobiotics and their role in our environment. (05 Marks)
(b) Write a note on biocatalyst selection for bioremediation. (05 Marks)
- iii. (a) Define Biotechnology; describe its role for the removal of pollutants. (05 Marks)
(b) What are plasmid, explain the function of catabolic plasmid for Biodegradation (05 Marks)