

Printed Page:-

Subject Code:- BBT0404

Roll. No:

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (20..... - 20.....)

Subject: Green Biotechnology and Pollution Abatement

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- 1-a. What is correct about aerobic bacteria? (CO1, K1) 1
- (a) Flourish in the presence of free oxygen
 - (b) Consume organic matter as their food
 - (c) Oxidise organic matter in sewage
 - (d) All of the above
- 1-b. What is the biggest environmental risk of hazardous waste? (CO1, K1) 1
- (a) Air pollution
 - (b) Contamination of ground water
 - (c) Increased use of land for landfills
 - (d) None of these
- 1-c. Bacterial assemblage can help in the degradation of _____ (CO2, K1) 1
- (a) Alcohol
 - (b) Carbonic acid
 - (c) Water
 - (d) Organic pollutants
- 1-d. The constituents which do not form eco-system are (CO2, K1) 1
- (a) Biotic constituents
 - (b) Plastic bags
 - (c) Abiotic constituents

- (d) All of these
- 1-e. Abzymes are (CO3, K1) 1
- (a) Proteins
- (b) DNA
- (c) RNA
- (d) Antibodies
- 1-f. At which part of the enzyme does the substrate fit in? (CO3, K1) 1
- (a) Left end
- (b) Right end
- (c) Active site
- (d) Binding site
- 1-g. Bioaugmentation is _____ (CO4, K1) 1
- (a) Using plants for bioremediation
- (b) Bioventing
- (c) Sludge removal
- (d) Adding microbes to a cleanup site
- 1-h. Benefit of clonal propagation or micropropagation is (CO4, K1) 1
- (a) Multiplication of sexually derived sterile hybrids
- (b) Multiplication of disease free plants
- (c) Rapid multiplication of superior clones
- (d) All of these
- 1-i. Which of the following bacteria cannot fix atmospheric nitrogen? (CO5, K1) 1
- (a) Nostoc
- (b) Anabaena
- (c) Oscillatoria
- (d) Lactobacillus
- 1-j. IPM stands for (CO5, K1) 1
- (a) Integrated pest manufacture
- (b) Integrated pest management
- (c) Integrated plant manufacture
- (d) Integrated plant management
2. Attempt all parts:-
- 2.a. What do you understand by sludge? (CO1, K1) 2
- 2.b. Write the full form of DDT? (CO2, K1) 2
- 2.c. According to lock and key model, what will be the behaviour of enzymes? (CO3, K1) 2
- 2.d. What is mycorrhizae? (CO4, K1) 2

2.e.	If the carbon to nitrogen (C:N) ratio is too high, then what will be its impact on decomposition? (CO5, K1)	2
SECTION-B		30
3.	Answer any <u>five</u> of the following:-	
3-a.	What are the minimal national standards for waste disposal? (CO1, K1)	6
3-b.	How does the use of green biotechnology helps in maintaining the safe and sustainable environment? (CO1, K1)	6
3-c.	What is biodegradation? Discuss in detail about the different factors that affect the biodegradation rate? (CO2, K1, K2)	6
3-d.	What are xenobiotics? Discuss briefly about the biological and chemical processes involved in the degradation of xenobiotics? (CO2, K1, K2)	6
3.e.	What are catalytic antibodies? Discuss in detail about the mechanism of enzyme-catalyzed reaction with the help of suitable example? (CO3, K1, K2)	6
3.f.	Illustrate the different steps of tissue culture techniques in the process of reforestation? (CO4, K4)	6
3.g.	What are the recommendations support by Ecological Society of America for genetically engineered organisms? (CO5, K1)	6
SECTION-C		50
4.	Answer any <u>one</u> of the following:-	
4-a.	With the help of labelled diagram, describe the process of trickling filter in detail? Also write their advantages and disadvantages? (CO1, K1)	10
4-b.	With the help of labelled diagram, describe the activated sludge process in detail? Also write their advantages and disadvantages? (CO1, K1)	10
5.	Answer any <u>one</u> of the following:-	
5-a.	Biotransformation may affect the solubility, mobility in the environment, or toxicity of the organic compound. Discuss? (CO2, K2)	10
5-b.	With the help of labelled diagram, explain biogas production in detail? Write their advantages and disadvantages? (CO2, K1,K2)	10
6.	Answer any <u>one</u> of the following:-	
6-a.	How lock and key hypothesis is different from induced fit model of enzyme action? Discuss both the model in detail? (CO3, K1,K2)	10
6-b.	Why biocatalysts are considered to be very sensitive compared to chemical catalysts? Also write some of the applications of biocatalysts in different industries? (CO3, K1)	10
7.	Answer any <u>one</u> of the following:-	
7-a.	How nutrients composition and oxygen level affects the rate of biodegradation? Also explain how microorganisms helps in increasing the soil fertility? (CO4,K1, K2)	10
7-b.	What do you understand by phytoremediation? Differentiate between ex-situ and in-situ remediation with examples? (CO4, K1, K4)	10

8. Answer any one of the following:-

- 8-a. What are biosensors? Draw a schematic diagram to show the main components of biosensors? Also write the working principle and various applications of biosensors? (CO5, K1) 10
- 8-b. Describe the production process of bioethanol for 1st and 2nd generation feedstock with the help of flowchart? (CO5, K1) 10

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