Printed Page:-04 **Subject Code:- ABT0404**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (2023 - 2024)

Subject: Green Biotechnology and Pollution Abetment

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. The process of converting wet waste to manure is called (CO1) 1

(a) Composting

(b) Incineration

(c) Conservation

(d) Metabolism

1-b. The solid waste from hospital is classified as: (CO1) 1

(a) Hazardous

(b) Non-hazardous

(c) Combustible

(d) Compostable

1-c. Bacterial assemblage can help in the degradation of _____ (CO2) 1

(a) alcohol

(b) carbonic acid

(c) water

(d) organic pollutants

1-d. Foreign substances which are chemical in nature found within an organism and produced naturally are called as _____ (CO2) 1

(a) Xenobiotics

(b) Bio-leaching

(c) Bio-remediation

(d) Bio-fortification

1-e. The general mechanism is that an enzyme acts by: (CO3) 1

(a) Reducing the activation energy

(b) Increasing activation energy

(c) Decreasing pH value

(d) Increasing the pH value

1-f. Abzymes are (CO3) 1

(a) Proteins

(b) DNAs

(c) RNAs

(d) Antibodies

1-g. This cleanup approach includes removal of groundwater or soil from its natural setting to permit for bioremediation (CO4) 1

(a) Bioaugmentation

(b) in situ bioremediation

(c) ex situ bioremediation

(d) Phytoremediation

1-h. _____ technique is usually done within the earthwork banking that has been constructed. (CO4) 1

(a) Land farming

(b) Bio sparging

(c) Bio-accumulation

(d) Bio-degradation

1-i. Which of the following is used as fuel for transportation (CO5) 1

(a) ethanol

(b) aldehyde

(c) ketone

(d) all of the above

1-j. The production of bioethanol is by fermenting the _____ and starch components. (CO5) 1

(a) Acid

(b) Milk

(c) Sugar

(d) Alcohol

2. Attempt all parts:-

2.a. What do you understand by biological anaerobic treatment? (CO1) 2

2.b. What are Xenobiotics? (CO2) 2

2.c. Define biocatalysts? (CO3) 2

2.d. How can you improve the conditions that are unfavourable to bioremediation? (CO4) 2

2.e. Write the name of some eco-friendly substitutes? (CO5) 2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a. What is biological aerobic treatment? Discuss any one of the process of biological aerobic treatment in detail? (CO1) 6

3-b. Give a brief account of solid waste management in detail? (CO1) 6

3-c. What are the different factors responsible for biodegradation? (CO2) 6

3-d. Summarize the concept of microbial degradation of hydrocarbons and biomagnification? (CO2) 6

3.e. "Enzymes are only active on their natural substrates". Justify this statement? (CO3) 6

3.f. Discuss in detail about the case study of restoration of coal mines? (CO4) 6

3.g. Discuss about bioethanol production in detail? (CO5) 6

SECTION C **50**

4. Answer any <u>one</u> of the following:-

4-a. Give a brief overview of biogas production with the help of suitable diagram? (CO1) 10

4-b. How will you manage biological waste near your surroundings? Give reasons to support your answer? (CO1) 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. Justify this statement? (CO2)	10
5-b.	How does the temperature and nutrient concentrations affects the rate of microbial degradation of hydrocarbons? (CO2)	10

6. Answer any <u>one</u> of the following:-

6-a.	Explain the basic organic reaction mechanism of enzyme with example? Also discuss about the Lock and Key model of enzyme action in detail? (CO3)	10
6-b.	With the help of some examples discuss how enzymes can be used in food industries? (CO3)	10

7. Answer any <u>one</u> of the following:-

7-a.	Explain in detail about the use of mycorrhizae in reforestation process? (CO4)	10
7-b.	Illustrate the process of bioremediation? Also discuss their different types? (CO4)	10

8. Answer any <u>one</u> of the following:-

8-a.	"Biotechnology helps in the protection of environment"?Justify this statement? (CO5)	10
8-b.	Diagrammatically explain biosensors in detail? Also write their different applications? (CO5)	10