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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 (2022-2023)****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. Which of the following area has the lowest chance of producing a biomedical waste?(CO1) 1
- (a) Hospitals
- (b) Clinics
- (c) Laboratories
- (d) Agricultural lands
- 1-b. Why is it difficult to recycle plastics?(CO1) 1
- (a) It is very hard
- (b) It comes in different sizes
- (c) It is adhesive
- (d) It contains different types of polymer resins
- 1-c. Which of the following is a biodegradable substance?(CO2) 1
- (a) Glass
- (b) Plants

- (c) Plastics
- (d) Polythene
- 1-d. Heavy metals are(CO2) 1
- (a) biodegradable
- (b) non toxic
- (c) highly effective
- (d) none of the above
- 1-e. Lock and Key model is also known as(CO3) 1
- (a) Template model
- (b) Induced fit model
- (c) Koshland Model
- (d) Enzyme-substrate interaction model
- 1-f. Which among them is a cofactor:(CO3) 1
- (a) Inorganic ion
- (b) Organic molecule
- (c) Both A and B
- (d) None of these
- 1-g. Bioaugmentation is a process that involves:(CO4) 1
- (a) Using plants for bioremediation
- (b) Bioventing
- (c) Sludge removal
- (d) Adding microbes to a cleanup site
- 1-h. Protoplasts are devoid of(CO4) 1
- (a) cell wall
- (b) cell membrane
- (c) both cell membrane and cell wall
- (d) none of these
- 1-i. Which biofuel is produced by the fermentation of sugarcane or corn?(CO5) 1
- (a) Ethanol
- (b) Methanol
- (c) Biodiesel
- (d) Butanol
- 1-j. The most quickly available source of nitrogen to plants are(CO5) 1

- (a) amide fertilizers
- (b) ammonia fertilizers
- (c) nitrate fertilizers
- (d) ammonia nitrate fertilizer

2. Attempt all parts:-

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|------|---|---|
| 2.a. | Write the name of some biological aerobic treatment methods?(CO1) | 2 |
| 2.b. | Define co-metabolism?(CO2) | 2 |
| 2.c. | What are catalytic antibodies?(CO3) | 2 |
| 2.d. | What do you understand by phytoremediation?(CO4) | 2 |
| 2.e. | Discuss characteristics of eco-friendly products?(CO5) | 2 |

SECTION B

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3. Answer any five of the following:-

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|------|--|---|
| 3-a. | Write Short note on trickling filter?(CO1) | 6 |
| 3-b. | Discuss activated sludge process in detail?(CO1) | 6 |
| 3-c. | Discuss in detail about the microbial degradation of xenobiotics?(CO2) | 6 |
| 3-d. | Discuss about the different factors that affect biodegradation rate?(CO2) | 6 |
| 3.e. | Write the advantages and limitations of whole cell catalysis? Discuss the medical application of enzymes?(CO3) | 6 |
| 3.f. | Enumerate the process of bioremediation?(CO4) | 6 |
| 3.g. | Discuss about the current status of biotechnology in environment protection?(CO5) | 6 |

SECTION C

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4. Answer any one of the following:-

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|------|--|----|
| 4-a. | Discuss the different factors involved in biogas oroduction?(CO1) | 10 |
| 4-b. | Explain biological waste? What are the impact of biological waste on environment?(CO1) | 10 |

5. Answer any one of the following:-

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|------|---|----|
| 5-a. | What are the different steps of biodegradation? Discuss in detail?(CO2) | 10 |
| 5-b. | Discuss in detail about gratuitous metabolism?(CO2) | 10 |

6. Answer any one of the following:-

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|------|---|----|
| 6-a. | In catalyzed reactions, the formation of the enzyme-substrate complex is the first step. Explain the other steps until the formation of the product.(CO3) | 10 |
|------|---|----|

- 6-b. With the help of some examples discuss how enzymes can be used in pharmaceutical industries?(CO3) 10

7. Answer any one of the following:-

- 7-a. Illustrate the process of phytoremediation?(CO4) 10
- 7-b. What is photovolatilisation?How photovolatilisation is different from Rhizofiltration?(CO4) 10

8. Answer any one of the following:-

- 8-a. Explain in detail about the impact of genetically engineered organisms on environment in detail?(CO5) 10
- 8-b. Explain in detail about the recommendations support by ecological society of America for genetically engineered organisms?(CO5) 10

2022-23 Jan_June