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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: II - THEORY EXAMINATION (2024- 2025)

Subject: Introduction to Biotechnology

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 endoplasmic reticulum functions to. (CO1, K1) | 1 |
| | (a) transport materials | |
| | (b) bdestroy old cell parts | |
| | (c) make ribosome | |
| | (d) package proteins | |
| 1-b. | The cytoplasm connections from cell to cell are known as (CO1, K1) | 1 |
| | (a) middle lamella | |
| | (b) plasmodesmata | |
| | (c) cell membrane system | |
| | (d) endoplasmic reticulum | |
| 1-c. | Which of the following is an indicator of air pollution? (CO2, K1) | 1 |
| | (a) Mycorrhiza | |
| | (b) Agaricus | |
| | (c) Lichens | |
| | (d) Common mushrooms | |
| 1-d. | Bacteria that live in hot springs are called (CO2, K1) | 1 |
| | (a) Halophiles | |
| | (b) Thermoacidophiles | |
| | (c) Methanogens | |

(d) None of the above

1-e. If a DNA strand contains the sequence 5'-ATTCCGGATCGA-3', which of the following is the sequence of the complementary strand of DNA? (CO3, K1) 1

(a) 5'-TAAGGCCTAGCT-3'

(b) 5'-ATTCCGGATCGA-3'

(c) 3'-TAACCGGTACGT-5'

(d) 5'-TCGATCCGGAAT-3'

1-f. Which of the following types of RNA codes for a protein? (CO3, K1) 1

(a) ds RNA

(b) mRNA

(c) rRNA

(d) tRNA

1-g. Which of the following protects our body against disease-causing pathogens? (CO4, K1) 1

(a) Respiratory system

(b) Immune system

(c) Digestive system

(d) Excretory

1-h. Hepatitis is an example of (CO4, K1) 1

(a) Subunit Vaccine

(b) Killer Vaccine

(c) Toxoids Vaccine

(d) Recombinant Vaccine.

1-i. GEAC stands for (CO5, K1) 1

(a) Genome Engineering Action Committee

(b) Ground Environment Action Committee

(c) Genetic Engineering Approval Committee

(d) Genetic and Environment Approval committee

1-j. Golden rice is: (CO5, K1) 1

(a) A variety of rice grown along the yellow river in China.

(b) Long stored rice having yellow color tint

(c) A transgenic rice having gene for – carotene

(d) Wild variety of rice with yellow coloured grains

2. Attempt all parts:-

2.a. What do you mean by plasmids? (CO1, K2) 2

2.b. Which cell between a eukaryote and a prokaryote has a shorter cell division time? (CO2, K2) 2

2.c.	How many strands make up a DNA double helix? (CO3, K2)	2
2.d.	Define antigen? (CO4, K2)	2
2.e.	Give the full form of ELISA. (CO5, K2)	2

SECTION-B

30

3. Answer any five of the following:-

3-a.	What is meant by tertiary structure of proteins? (CO1, K2)	6
3-b.	What is cytoplasm? Give its functions? (CO1, K2)	6
3-c.	Briefly discuss the Contributions of Louis Pasteur? (CO2, K2)	6
3-d.	What are the different shapes of cells? Explain with examples? (CO2, K2)	6
3.e.	Write down the properties of genetic material? (CO3, K2)	6
3.f.	What makes a person immune to various diseases? (CO4, K2)	6
3.g.	Discuss the role of plasmids and bacteriophages in rDNA technology? (CO5, K2)	6

SECTION-C

50

4. Answer any one of the following:-

4-a.	Describe the ultra-structure of Golgi complex? Discuss the various functions of Golgi complex? (CO1, K3)	10
4-b.	What are lipids? Differentiate between simple. compound and derived lipids? Discuss the importance and functions of lipids? (CO1, K3)	10

5. Answer any one of the following:-

5-a.	Describe the various events that occur during the process of meiosis cell division? (CO2, K3)	10
5-b.	Describe the events taking place during S phase of interphase? (CO2, K3)	10

6. Answer any one of the following:-

6-a.	Discuss the process of transcreption in detail. Give an account of post transcriptional modifications of a eukaryotic mRNA.. (CO3, K3)	10
6-b.	Describe Meselson and Stahl's experiment and write the conclusion they arrived at. (CO3, K3)	10

7. Answer any one of the following:-

7-a.	Discuss the Human immune system under the following headings--- (i) lymphoid organs (ii) immune cells (iii) soluble molecules like antibodies. (CO4, K3)	10
7-b.	Define autoimmune diseases. Give two examples. Name the primary and secondary lymphoid organs. (CO4, K3)	10

8. Answer any one of the following:-

8-a.	PCR is a useful tool for early diagnosis of an infectious disease? Justify it. (CO5, K3)	10
8-b.	What is bioreactor? With the help of diagram discuss the components of bioreactors? (CO5, K3)	10