Printed Page:-03 **Subject Code:- BBT0201**

Roll. No:

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 cell membrane is elastic because. (CO1, K1) 1

(a) It has long protein molecule.
(b) It has a double layer of lipid molecules
(c) It has glycoprotein molecules.
(d) It is semi permeable.

1-b. Who proved that plant cells are totipotent? (CO1, K1) 1

(a) Steward
(b) Muir
(c) Haberlandt
(d) Maheshwari

1-c. If an individual wants to view diakinesis, which of these would be (CO2, K1) 1

(a) Hair
(b) Leaf
(c) Onion root
(d) Flower bud

1-d. The spindle apparatus is formed during the _____ phase of mitosis. (CO2, K1) 1

(a) Telophase
(b) Metaphase
(c) Prophase

(d) Anaphase

1-e. What term is used to describe the process by which DNA is copied to produce two daughter DNA molecules. (CO3, K1) 1

(a) Reproduction
(b) Replication
(c) Translation
(d) Transcription

1-f. Who proposed the the DNA as genetic material? (CO3, K1) 1

(a) Griffith
(b) Robert hook
(c) Robert brown
(d) Harshey and Chase

1-g. Immunoglobulins involved in hypersensitivity is (CO4, K1) 1

(a) IgA
(b) IgE
(c) IgD
(d) IgG

1-h. TAB vaccine is useful against (CO4, K1) 1

(a) Polio
(b) Pertussis
(c) Typhoid
(d) Diphtheria

1-i. Reagent used in ELISA test is (CO5, K1) 1

(a) Endonuclease
(b) Polymerase
(c) Ligase
(d) Peroxidase

1-j. By means of following Trans gene expression obtained: (CO5, K1) 1

(a) Inhibition of a Innate gene
(b) An occured Biosynthetic passway develop
(c) A protein occured with genotype expressed his desired
(d) None of the above

2. Attempt all parts:-

2.a. Write down the important points of cell theory? (CO1, K2) 2

2.b. Describe metaphase of mitosis? (CO2, K2) 2

2.c. Write down the two characteristics features of genetic material? (CO3, K2) 2

2.d. Name one example of artificial passive immunity. (CO4, K2) 2

2.e.	Name one widely used artificial vector and one natural vector used to make GMOs? (CO5, K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Give an account of structure and functions of endoplasmic reticulum? (CO1, K2)	6
3-b.	Describe the structure of cell wall and state its functions?(CO1, K2)	6
3-c.	Tabulate the difference between equational cell division and reductional cell division. (CO2, K2)	6
3-d.	Draw the diagram of reductional cell division? (CO2, K2)	6
3.e.	Differentiate between heterochromatin and euchromatin? What is the function of non histone chromosomal protein? (CO3, K2)	6
3.f.	Name the type of cells that produce antibodies.What is the process by which antibodies recognize and bind to specific molecules? (CO4, K2)	6
3.g.	Discuss the three critical research areas of Biotechnology? (CO5, K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Briefly describe the properties and functions of proteins? (CO1, K3)	10
4-b.	What are carbohydrates? Give the properties of carbohydrates? (CO1, K3)	10

5. Answer any one of the following:-

5-a.	What are homologous chromosome? What happens to homologous during meiosis? (CO2, K3)	10
5-b.	Draw a labelled sketch showing various stages of meiosis? (CO2, K3)	10

6. Answer any one of the following:-

6-a.	Describe the various steps of Griffth experiment that led to the conclusion of a transforming principle? (CO3, K3)	10
6-b.	Discuss the Harshey and Chase experiment. Write the conclusion drawn by the scientist after their experiment? (CO3, K3)	10

7. Answer any one of the following:-

7-a.	How does a vaccine for a particular disease immunise the human body against a disease? (CO4, K3)	10
7-b.	Name and explain the type of immunity that is provided by injecting microbes during immunisation into the human body? (CO4, K3)	10

8. Answer any one of the following:-

8-a.	What is bioreactor? With the help of diagram discuss the components of bioreactors? (CO5, K3)	10
8-b.	Explain in sequence of process of amplification of a gene of interest using PCR? (CO5, K3)	10