Printed Page:-04 **Subject Code:- BBT0302**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2024 - 2025)

Subject: Microbiology

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 organisms that can thrive both in presence and absence of oxygen are known as (CO1,K1) 1

(a) Aerobic
(b) Anaerobic
(c) Facultative anaerobe
(d) obligate anaerobe

1-b. Which of these is a differential staining technique for gram postive and gram negative bacteria(CO1,K1) 1

(a) Acid fast staining
(b) Gram staining
(c) Capsule staining
(d) endospore staining

1-c. Protein cover that encloses the viruses and also encloses its genetic material is known as (CO2,K2) 1

(a) Protein coat
(b) Capsid
(c) Capsomere
(d) Spike proteins

1-d. Which is the prominent pigment found in the green algae (CO2,K2) 1

(a) Chlrorophyll A
(b) Carotene
(c) Phycobilins
(d) Xanthophyll

1-e. Which type of microorganisms can use inorganic compounds as an energy source?(CO3,K1) 1

(a) Autotrophs
(b) Heterotrophs
(c) Chemotrophs
(d) Phototrophs

1-f. Sterilization is the process of (CO3,K1) 1

(a) Degermination
(b) Killing of microorganism
(c) Removal of all forms of life
(d) removal of pathogenic bacteria only 1

1-g. How does alcohol prevent microbial growth(CO4,K3) 1

(a) causes dehydration
(b) reduces microbial motility
(c) Destroy white blood cells
(d) Promote microbial growth

1-h. What is also known as fractional sterilization?(CO4,K3) 1

(a) Lyophilisation
(b) Pasteruisation
(c) Radiation
(d) Tyndalisation

1-i. The commonly used grain in the production of beer is(CO5,K1) 1

(a) Barley
(b) Rice
(c) Corn
(d) Wheat

1-j. The function of the grit chamber in sewage treatment plant is (CO5,K1) 1

(a) To remove pathogens
(b) To remove heavy particles sand and gravel
(c) To decompose organic matter
(d) To filter particles

2. Attempt all parts:-

2.a. Describe the germ theory of disease.(CO1,K1) 2

2.b. What are the main components of a bacterial cell wall?(CO2,K2) 2

2.c.	Explain how halophilic microorganisms adapt to high salt concentrations.(CO3,K1)	2
2.d.	List two common disinfectants used in microbiology labs and describe their mode of action briefly.(CO4,K3)	2
2.e.	What role does yeast play in wine fermentation?(CO5,K1)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Describe the sexual mode of reproduction in bacteria and describe any two modes of sexual reproduction in bacteria? (CO1,K1)	6
3-b.	What is an endospore ?Under what circumstances it is formed andhow can a endospore forming bacteria be identified?(CO1,K1)	6
3-c.	Explain the morphology of bacterial cells, including common shapes and sizes.(CO2,K2)	6
3-d.	Compare and contrast the cellular structures of fungi and bacteria.(CO2,K2)	6
3.e.	What is a pure culture? Explain its importance in microbiological studies.(CO3,K1)	6
3.f.	Explain the importance of culture banks in preserving genetic diversity among microorganisms and their role in research and industrial applications.(CO4,K3)	6
3.g.	What are Single Cell Proteins (SCPs) mention the propeties that organisms should have to be used for single cell protein production?(CO5,K1)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Describe the development and impact of the germ theory of disease.(CO1,K1)	10
4-b.	Describe how can a bacterial and fungal cell be discriminated from each other on the basis of cellular morphology explain in detail. (CO1,K1)	10

5. Answer any one of the following:-

5-a.	Outline the main components of the bacterial cell wall in Gram-positive and Gram-negative bacteria, and explain the function of each.(CO2,K2)	10
5-b.	Explain the structural and functional differences between viruses and cellular organisms, and discuss why viruses are classified as acellular entities.(CO2,K2)	10

6. Answer any one of the following:-

6-a.	Explain the role of pH and temprature and humidity in the microbial growth?(CO3,K1)	10
6-b.	Describe the process of enumerating microbial populations using viable count techniques such as plate count method. Include steps involved and limitations.(CO3,K1)	10

7. Answer any one of the following:-

7-a.	Describe the physical agents used for controlling microbial growth, including their modes of action and examples.(CO4,K3)	10

7-b.	Distinguish between sterilization and disinfection, providing examples of each method and their applications.(CO4,K3)	10

8. Answer any one of the following:-

8-a.	Explain how natural products like plant extracts are screened for antimicrobial activity using various in vitro assays such as agar diffusion and broth dilution methods.(CO5,K1)	10
8-b.	Explain how probiotics can be used to enhance immune function and prevent diseases such as gastrointestinal disorders or allergies, providing examples of probiotic strains used for these purposes.(CO5,K1)	10