MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

SEMESTER B.TECH. END SEMESTER EXAMINATION 2023

SUBJECT: INDUSTRIAL MICROBIOLOGY

[BIO 2155]

Date of Exam: 12.12.23 **Time of Exam:9:30-12.30** **Max. Marks: 50**

Q. No.	Questions	Marks	CO	BLT
1A	Justify "There is a supporting the link between alterations in gut microbiota and Parkinson's disease". How do these changes in the gut microbiome potentially influence the central nervous system? Give two clinical interventions for the condition	**4**	**4**	**3**
1B	Describe different methods of sterilization commonly used in healthcare settings. Highlight the advantages and limitations of each method.	**3**	**1**	**3**
1C	Outline the considerations for selecting an appropriate antifungal agent for a specific fungal infection. How does the choice of antifungal depend on factors such as the type of infection, patient characteristics, and potential drug interactions?	**3**	**2**	**3**
2A	Ebola virus is said to be zoonotic in origin. With the help of a neat diagram trace the transmission of the pathogenic cycle in humans. The term "**antigenically distinct"** is used for Ebola virus (EBOV) and Sudan virus. What does this term imply?	**3**	**1**	**2**
2B	Evaluate the challenges in diagnosing Nipah virus infections, considering both clinical and laboratory aspects. What diagnostic methods are commonly employed, and how can early diagnosis impact patient outcomes.	**3**	**2**	**3**
2C	Explain the life cycle of retroviruses and how it relates to retroviral transduction. What unique features of retroviruses make them suitable for certain gene delivery applications.	**4**	**3**	**4**
3A	Discuss the unique challenges and characteristics of pneumonic plague, including its potential for person-to-person transmission. Why is pneumonic plague considered the most severe form of the disease?	**3**	**3**	**3**
3B	Describe the key experiments conducted by Edward Tatum and Joshua Lederberg in the 1940s that significantly contributed to our understanding of bacterial genetics. How was the work of Davis helpful to further deepen this understanding?	**4**	**3**	**3**

3C	A group of students were working on mutating transpeptidase enzyme. What group of microbes would they be studying? What impact will the mutation of transpeptidase have on these microbes.	**3**	**2**	**4**
4A	Discuss the concept of bioremediation as a strategy for oil spill cleanup. Provide examples of microorganisms involved and explain how they contribute to the degradation of oil. Highlight any factors that may influence the success of bioremediation efforts.	**3**	**4**	**3**
4B	Discuss the ecological importance of Basidiomycota fungi in forest ecosystems. Explain their roles in mycorrhizal associations and nutrient cycling.	**3**	**2**	**2**
4C	Provide examples of economically important Ascomycota fungi and their roles in agriculture or industry. Also depict their life cycle illustrating the ploidy level.	**4**	**2**	**2**
5A	A mutation occurred in the genome of a lambda phage, resulting in the deletion of the integrase gene. What consequences would this mutation have on the viral life cycle? Illustrate the impact of this mutation on infection precision using a diagram.	**3**	**1**	**4**
5B	Explain how microbial metabolic pathways, such as glycolysis and citric acid cycle, contribute to the production of key compounds during cheese fermentation. Provide specific examples of metabolites involved in the process.	**4**	**4**	**4**
5C	Explain the role of fermentation in the chocolate-making process. What specific changes occur in cocoa beans during fermentation, and how do these changes contribute to the flavor and quality of the final chocolate product?	**3**	**4**	**3**

CO: Course Outcome;

BLT: BLOOM TAXONOMY LEVEL:

1-Remember, 2-Understand, 3-Application,

4-Analysis, 5-Evaluation, 6-Creation