Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2023

Course: Fermentation and Industrial Microbiology **Semester: 6th**

Program: B. Tech. Food Technology **Duration: 3 Hours**

Course Code: HSMB3009 **M M: 100**

Instructions:

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1			
1	Define substrate inhibition.	1.5	CO 1
2	State the importance of microorganisms in food.	1.5	CO 1
3	List any three enzymes produced by fermentation.	1.5	CO 1
4	List any three oriental fermented foods.	1.5	CO 1
5	_____is used for sterilization of media at a temperature and pressure of _____ and _____	1.5	CO 1
6	Mushroom can be cultivated in _____ days under _____ temperature and _____ humidity.	1.5	CO 1
7	Identify any three cereal fermented food.	1.5	CO 2
8	Report the starter culture for yogurt and culture buttermilk	1.5	CO 2
9	Select the yeast species for top and bottom fermentation of beer	1.5	CO 2
10	Report any three sensors and their utility in bioreactors.	1.5	CO 2
11	Explain diauxic growth.	1.5	CO 2
12	Discuss the utility of baffle and sparger in bioreactor.	1.5	CO 2
13	Classify the microorganisms based on temperature	1.5	CO 2
14	Illustrate the application of anaerobic microbes.	1.5	CO 3
15	Write any two benefits of fermented foods.	1.5	CO 3
16	Sketch the growth phases of bacteria.	1.5	CO 3
17	Write three fermented foods from corn.	1.5	CO 3
18	Demonstrate the application of single cell protein in food	1.5	CO 3
19	Write any three-mushroom variety.	1.5	CO 3
20	Sketch the well labelled diagram of bioreactor.	1.5	CO 3

Section B (4Qx5M=20 Marks)			
Q 1			
1	**Examine the characteristics of ideal antifoam.**	**5**	**CO 4**
2	**Illustrate the process of miso production with the help of flowchart.**	**5**	**CO 3**
3	**During exponential phase in batch culture, the growth rate of a culture is proportional to the concentration of cell present. When Streptococcus lactis bacteria are cultured in milk, the concentration of cells doubled in 45 min. If this rate of growth is maintained for 12 h. What is the final concentration of the cells relative to the inoculum level?**	**5**	**CO 5**
4	**Discuss single cell protein. What are the advantages and disadvantages of single cell protein?**	**5**	**CO 2**
Section C (2Qx15M=30 Marks)			
Q 1			
1	**a. Sample of bacterial culture taken at 5 PM and the next day at 5 AM user found to have 10^4 and 10^7 cells/µl, respectively. Assuming that both the samples were taken during log phase, the generation time of the bacterium will be?** **b. Describe the downstream processing steps involved in industrial fermentation, including product recovery, purification, and formulation.**	**5** **10**	**CO 5**
2	**Examine the methods for isolating and maintaining pure cultures of microorganisms in fermentation processes.**	**15**	**CO 4**
Section D (2Qx10M=20 Marks)			
Q 1			
1	**Write short notes on the following:** **a. Ripening of cheese** **b. Defects in wine** **c. Beer** **d. Sauerkraut**	**10**	**CO 3**
2	**Appraise the production of baker's yeast and vinegar through fermentation processes.**	**10**	**CO 5**