Name: **Enrolment No:**	

UPES

End Semester Examination, December 2024

Course: Microbiology and Microbial Technology — **Semester : III**

Program: B.Tech Biotechnology, BME & Food Technology — **Duration : 3 Hours**

Course Code: HSMB2040 — **Max. Marks: 100**

Instructions: Read all questions carefully

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	Which of these is NOT a product of fermentation? (A) Lactate (B) Oxygen (C) Carbon dioxide (D) Ethanol	1.5	CO1
Q 2	The type of fermentation observed in yeasts is (A) Acrylic fermentation (B) Lactic acid fermentation (C) Pyruvic fermentation (D) Alcoholic fermentation	1.5	CO1
Q 3	One of the most commonly used fermented cereal amongst these is (A) Wheat (B) Bread (C) Rice (D) Yoghurt	1.5	CO1
Q 4	Microorganisms used in fermentation technology shall not_____? (A) Grow rapidly in cheap culture medium (B) Readily manipulated (C) Pathogenic (D) All of the above	1.5	CO1
Q 5	Which of the following method is not used in isolation and screening of desired microorganisms? (A) Crowded plate technique (B) Auxanographic technique (C) Enrichment culture technique (D) Hanging drop technique	1.5	CO2
Q 6	Which of the following is NOT a carbon source? (A) Blackstrap molasses (B) Corn molasses (C) Beet molasses (D) Yeast extract	1.5	CO2
Q 7	Which of the following procedure has a great application in strain improvement? (A) rDNA technology (B) Conjugation (C) Transformation (D) Transduction	1.5	CO2
Q 8	The preservation by liquid nitrogen is called as _____? (A) Cryopreservation (B) Lyophilization (C) Freeze-drying (D) Desiccation	1.5	CO2

Q 9	The heat control at large-scale in the fermenter is carried out by _____ ? (A) Inter heating coils (B) Heating jacket (C) Controlled bath (D) Cold-water circulation	1.5	CO3
Q 10	Which of the following is not the component of aeration and agitation system? (A) Impeller (B) Baffles (C) Sparger (D) Thermometer	1.5	CO3
Q 11	The Batch fermenter is a/an _____ culture system? (A) Open (B) Closed (C) Isolated (D) Semi-closed	1.5	CO3
Q 12	Which growth phase is usually longer in continuous culture? (A) Lag (B) Log (C) Stationary (D) Death	1.5	CO3
Q 13	The large holes in the cheese are due to _____? (A) Oxygen production (B) Carbon dioxide production (C) Sulfur dioxide release (D) Lead dioxide release	1.5	CO4
Q 14	Which of the following is the most common method for citric acid production? (A) Solid-state fermentation (B) Submerged fermentation (C) Surface fermentation (D) Surface adhesion fermentation	1.5	CO4
Q 15	Which of the following parameter increases the yield of alpha amylase? (A) Temperature (B) pH (C) Mutation (D) Buffer	1.5	CO4
Q 16	Which of the following process encourages grain germination? (A) Malting (B) Milling (C) Mashing (D) Boiling	1.5	CO4
Q 17	Which of the following is the most effective method for sterilizing heat-sensitive liquids? (A) Autoclaving (B) Boiling (C) Filtration (D) UV irradiation	1.5	CO5
Q 18	Which of the following sterilization methods is commonly used for liquid foods like juices and milk? (A) Dry heat (B) Pasteurization (C) Filtration (D) UV irradiation	1.5	CO5
Q 19	Which of the following is a selective growth medium that inhibits the growth of Gram-negative bacteria? (A) MacConkey agar (B) Mannitol Salt Agar (MSA) (C) Eosin Methylene Blue (EMB) agar (D) Blood Agar	1.5	CO5
Q 20	What is the end product of anaerobic respiration in yeast? (A) Lactic acid (B) Glucose (C) Ethanol and carbon dioxide (D) Water and oxygen	1.5	CO5

Section B (4Qx5M=20 Marks)			
Q 1	Differentiate between aerobic and anaerobic fermentation?	5	CO1
Q 2	State the application of MacConkey Agar media as differential media.	5	CO2
Q 3	Evaluate the role of agitation in oxygen transfer.	5	CO3
Q 4	Argue why microbes are preferred in industries for the production of valuable products.	5	CO1
Section C (2Qx15M=30 Marks)			
Q 1	A scientist wants to produce a protease enzyme that should catalyze at lower pH conditions. A. How do you isolate microbes to produce protease enzymes using the methods of isolation, enrichment, screening, and strain improvement? **(10 marks)** B. Explain the type of fermentation process you would apply for the production of protease enzyme and why? **(5 marks)**	15	CO2
Q 2	In a wine-producing company, they encounter overproduction of foam during fermentation. A. Explain how would you reduce or clear the foam using chemical or physical measures? **(5 marks)** B. State the principle and ideal properties of chemicals used for foam clearance in industrial fermentation **(5 marks)** C. List the examples of different chemicals used for foam clearance **(5 marks)**	15	CO3
Section D (2Qx10M=20 Marks)			
Q 1	Develop a fermentation process for wine production using apples and describe the steps involved in detail with an illustration.	10	CO4
Q 2	Explain in detail about the microbial growth cycle with illustration. **(6 marks)** Explain why the log and stationary phases are preferred in the industry with example. **(4 marks)**	10	CO5