Name: **Enrolment No:**	

UPES

End Semester Examination, May 2024

Course: Fermentation and Industrial Microbiology — **Semester : VI**

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

Course Code: HSMB3009 — **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	*Saccharomyces cerevisiae* is commonly used in fermentation for producing: A) Beer and wine B) Vinegar C) Antibiotics D) Cheese	1.5	CO1
Q 2	The main purpose of fermentation is to: A) Generate energy in the form of ATP B) Convert organic substrates into products C) Produce oxygen for cellular respiration D) Synthesize DNA	1.5	CO1
Q 3	Lactic acid fermentation is used in the production of: A) Yogurt B) Bread C) Wine D) Beer	1.5	CO1
Q 4	Which of the following is NOT a product of fermentation? A) Ethanol B) Acetic acid C) Glucose D) Lactic acid	1.5	CO1
Q 5	The microorganism responsible for producing penicillin is: A) *Escherichia coli* B) *Saccharomyces cerevisiae* C) *Penicillium chrysogenum* D) *Streptococcus pneumoniae*	1.5	CO2
Q 6	*Acetobacter aceti* is used in the production of: A) Bread B) Vinegar C) Antibiotics D) Yogurt	1.5	CO2
Q 7	The conversion of milk into curd is an example of: A) Aerobic fermentation B) Anaerobic fermentation C) Lactic acid fermentation D) Alcohol fermentation	1.5	CO2
Q 8	Which of the following is NOT a characteristic of industrial fermentation? A) Production of large quantities of products B) Use of pure cultures of microorganisms C) Low substrate concentration D) Controlled environmental conditions	1.5	CO2
Q 9	The process of using microorganisms to remove pollutants from the environment is called: A) Fermentation B) Bioremediation C) Antibiotic production D) Pasteurization	1.5	CO3

Q 10	Which of the following is NOT a factor affecting fermentation? A) pH B) Temperature C) Pressure D) Gravity	1.5	CO3
Q 11	The microorganism used in the production of soy sauce is: A) *Aspergillus oryzae* B) *Lactobacillus acidophilus* C) *Streptococcus thermophilus* D) *Clostridium botulinum*	1.5	CO3
Q 12	The Fed-batch fermenter is a/an _____ culture system A) Open B) Closed C) Isolated D) Semi-closed	1.5	CO3
Q 13	Which of the following is a disadvantage of batch fermentation? A) High initial capital cost B) Inability to control environmental conditions C) Longer fermentation times D) Low product yields	1.5	CO4
Q 14	The microorganism used in the production of miso is: A) *Saccharomyces cerevisiae* B) *Lactobacillus casei* C) *Aspergillus oryzae* D) *Streptococcus thermophilus*	1.5	CO4
Q 15	Which of the following fungi produces alpha-amylase? A) *Bacillus subtilis* B) *Penicillium* C) *Bacillus diastaticus* D) *Bacillus megaterium*	1.5	CO4
Q 16	Which of the following is a product of *Lactobacillus casei* fermentation? A) Ethanol B) Lactic acid C) Citric acid D) Butanol	1.5	CO4
Q 17	The microorganism used in the production of kefir is: A) *Saccharomyces cerevisiae* B) *Lactobacillus acidophilus* C) *Leuconostoc mesenteroides* D) *Lactobacillus kefir*	1.5	CO5
Q 18	Industrially important Antibiotic producing organisms shall be isolated by A) Disc diffusion method B) Media containing antibiotic C) Crowded plate method D) Auxanography technique	1.5	CO5
Q 19	Which is not true for the batch fermentation A) Easy to operate B) Lower contamination C) No accumulation of toxins D) Batch-to-batch variability	1.5	CO5
Q 20	Which part of the fermentor is useful for thorough mixing of medium and inoculum A) Sparger B) Impeller C) Baffles D) Anti-foam agent	1.5	CO5
Section B 4Qx5M=20 Marks)			
Q 1	List any five components of the fermenter and their function.	5	CO1
Q 2	Describe the stages involved in the selection of industrially important microbes.	5	CO2
Q 3	What is selective media and how it differ from differential media with an example	5	CO3
Q 4	Illustrate the design of a solid-state fermenter and list the solid substrates used.	5	CO3

Section C **2Qx15M=30 Marks)**			
Q 1	A food industry wants to produce amylase that should be active at higher pH conditions. A. How do you isolate microbes to produce the amylase using the methods of isolation, enrichment, and screening? B. Explain the type of substrate, organism, and fermentation process you would apply to produce the amylase and why.	15 (8+7)	CO2
Q 2	You are a winemaker overseeing the fermentation process at a prestigious winery. A. What is the difference between red wine, rose wine, and white wine? Explain the type of submerged fermenter that is preferred for wine production with justification. B. Describe the steps and procedures of wine production in detail with an illustration	15 (8+7)	CO5
Section D **2Qx10M=20 Marks)**			
Q 1	List a total of five homemade fermented foods, with the appropriate substrate, organism, and fermentation used and their health benefits.	10	CO2
Q 2	Write the beer production process and the fermentation steps involved in detail with an illustration.	10	CO4