


Name:			
Enrolment No:			
UPES End Semester Examination, December 2024			
Course: Fermentation Technology		Semester: 3 rd	
Program: MSC-MICROBIOLOGY		Duration: 3 Hours	
Course Code: HSMB8002		Max. Marks: 100	
Instructions: Attempt all questions			
S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	Which microorganism is used to produce penicillin? a) Saccharomyces cerevisiae b) Aspergillus niger c) Penicillium chrysogenum d) Escherichia coli	1.5	CO5
Q 2	Which of the following is a secondary metabolite? a) Ethanol b) Penicillin c) Glucose d) Lactic acid	1.5	CO1
Q 3	The main function of buffers in fermentation media is to _____. a) Increase agitation b) Maintain pH stability c) Act as a carbon source d) Prevent contamination	1.5	CO2
Q 4	The type of fermenter that is commonly used for aerobic fermentation? a) Airlift fermenter b) Tower fermenter c) Deep jet fermenter d) Packed column	1.5	CO1
Q 5	In fed-batch fermentation, nutrients are added: a) At the beginning b) Continuously during the process	1.5	CO5

	c) At intervals during the process d) After the process is complete		
Q 6	Which of the following is an example of a fed-batch culture? a) Antibiotic production b) Ethanol fermentation c) Single-cell protein production d) All of the above	1.5	CO4
Q 7	Which vitamin is produced by microbial fermentation? a) Vitamin C b) Vitamin B1 c) Vitamin D d) Vitamin A	1.5	CO5
Q 8	The primary nitrogen source in fermentation media is? a) Glucose b) Ammonium salts c) Sodium chloride d) Magnesium sulfate	1.5	CO3
Q 9	Cryopreservation of animal cells involves freezing cells at approximately: a) -20°C b) -40°C c) -80°C d) -196°C	1.5	CO1
Q 10	Which stage in microbial growth corresponds to the production of secondary metabolites? a) Lag phase b) Exponential phase c) Stationary phase d) Death phase	1.5	CO1
Q 11	Antibiotics are produced during the lag phase of microbial growth. (True or False)	1.5	CO2
Q 12	Mutant strains can improve industrial production of metabolites. (True or False)	1.5	CO3
Q 13	Agitation in a fermenter helps maintain uniform nutrient distribution. (True or False)	1.5	CO4
Q 14	Cryopreservation is used for maintaining microbial germplasm only. (True or False)	1.5	CO4
Q 15	Citric acid fermentation requires high levels of oxygen. (True or False)	1.5	CO5
Q 16	The following is one of the most used fermented cereals... a) Wheat b) Rice c) Bread d) Yoghurt	1.5	CO1
Q 17	Impellers are an essential part of the _____	1.5	CO2

Q 18	There is a high amount of nutrients in growth media. (True or False)	1.5	CO1
Q 19	Alcoholic fermentation is carried by yeast known as _____ a) Lactobacillus b) Bacillus c) Saccharomyces cerevisiae d) Escherichia coli	1.5	CO2
Q 20	The production of substances in industrial microbiology occurs in the sequence: a) fermentation, downstream processing, removal of waste, inoculation. b) inoculation, downstream processing, fermentation, removal of waste. c) inoculation, fermentation, downstream processing, removal of waste. d) removal of waste, inoculation, fermentation, downstream processing.	1.5	CO1
Section B (4Qx5M=20 Marks)			
Q 1	Differentiate primary and secondary metabolites and level them in a microbial growth curve.	5	CO1
Q 2	Create generic diagrammatic representation of a fermentation process	5	CO2
Q 3	Explain thoughts and definitions of fermentations according to field experts.	5	CO1
Q 4	Illustrate five major domains of fermentation.	5	CO2
Section C (2Qx15M=30 Marks)			
Q 1	Evaluate the effectiveness of microbial fermentation in the production of citric acid, considering key steps and factors involved. (5 Marks) Assess the significance of other microbial products produced through fermentation, discussing their industrial applications and comparing their impact. (10 Marks)	15	CO5
Q2	Design an innovative guide outlining the principles of animal cell culture, emphasizing the types of culture media and nutritional requirements for optimal cell growth. (10 Marks) Propose creative applications of animal cell culture in biotechnology, highlighting its potential advancements. (5 Marks)	15	CO6
Section D (2Qx10M=20 Marks)			
Q 1	Write down major and minor components of a fermentation media. (5 Marks)	10	CO2

	Give five sources of Carbons that are used in industry today. (5 Marks)		
Q2	Describe the importance of rDNA in strain improvement. (5 Marks) Draw basic schematics of recombinant DNA technology. (5 Marks)	10	CO2