Name: **Enrolment No:**	

UPES

End Semester Examination, May 2025

Course: Industrial Microbiology **Semester: IV**
Program: BSC-FND **Duration: 3 Hours**
Course Code: HSMB2044P_4P5 **Max. Marks: 100**

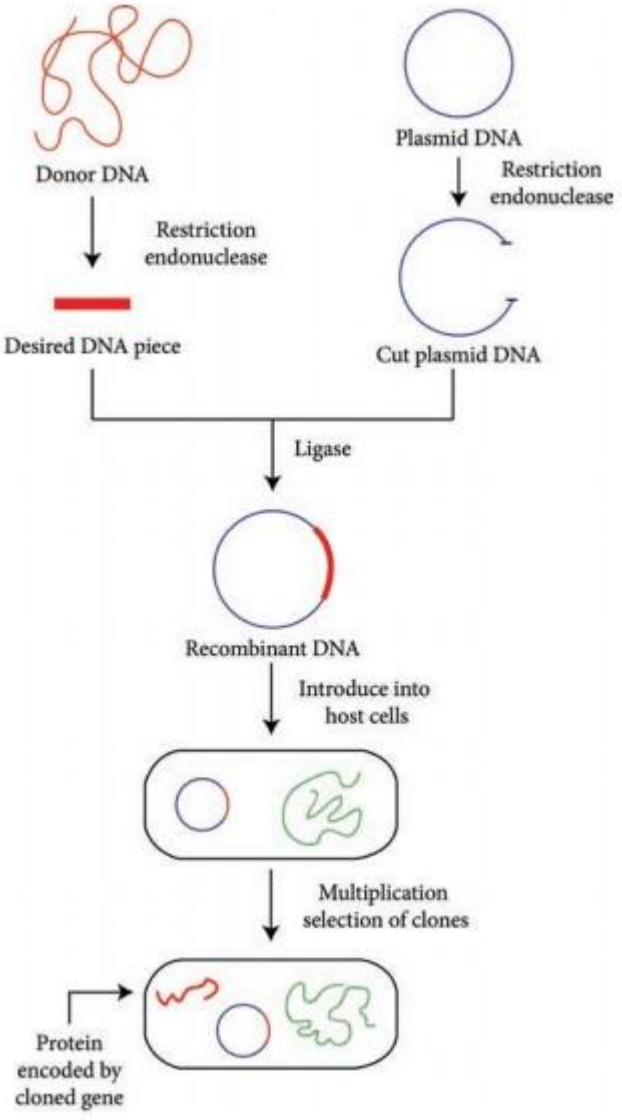
Instructions: NIL

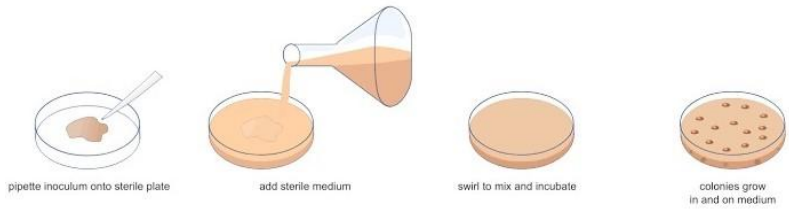
S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1.	The following is a eukaryotic microorganism - A. Bacteria B. Virus C. Protozoa D. Archaea	1.5	CO1
Q 2.	Prokaryotic microorganisms lack - A. Ribosomes B. Nucleus C. Cell wall D. Cytoplasm	1.5	CO1
Q 3.	Microorganisms that can survive in extreme environments are called: A. Bacteria B. Fungi C. Archaea D. Algae	1.5	CO1
Q 4.	Staining technique is used to classify bacteria is A. Simple stain B. Acid-fast stain C. Gram stain D. Negative stain	1.5	CO1

Q 5.	Gram-positive bacteria appear _____ under the microscope. A. Pink B. Red C. Blue D. Purple	1.5	CO1
Q 6.	Bergey's Manual is used for: A. Virus classification B. Fungi classification C. Bacterial classification D. Protozoa classification	1.5	CO1
Q 7.	Bergey's Manual classifies bacteria based on: A. Shape only B. Metabolism only C. Genetic and phenotypic characteristics D. Reproduction only	1.5	CO1
Q 8.	A Gram-negative group in Bergey's classification includes A. Firmicutes B. Actinobacteria C. Proteobacteria D. Cyanobacteria	1.5	CO1
Q 9.	Actinobacteria have: A. Low G+C content B. No cell wall C. High G+C content D. Flagella only	1.5	CO1
Q 10.	Molecular tool is widely used for bacterial classification today is A. DNA fingerprinting B. Protein sequencing C. 16S rRNA sequencing D. Gram staining	1.5	CO1

Q 11.	Secondary metabolites are usually produced during which phase? A. Lag phase B. Log phase C. Stationary phase D. Death phase	1.5	CO2
Q 12.	. In batch fermentation, nutrients are: A. Continuously added B. Added only at the beginning C. Never added D. Removed during fermentation	1.5	CO2
Q 13.	Synchronous growth means - A. All cells die together B. All cells grow at different times C. All cells divide at the same time D. Cells grow randomly	1.5	CO2
Q 14.	The purpose of sterilization in microbiology - A. Increase cell count B. Enhance growth C. Destroy all microbial life D. Preserve samples	1.5	CO2
Q 15.	Nutrient is not typically part of a basic microbial culture media - A. Carbon source B. Nitrogen source C. Vitamin D D. Salts	1.5	CO2
Q 16.	The role of inoculum in fermentation is A. To filter the product B. To sterilize the vessel C. To initiate microbial growth D. To stop fermentation	1.5	CO3
Q 17.	A bioreactor used for - A. DNA isolation B. Cell staining	1.5	CO3

	C. Fermentation under controlled conditions D. Filtration		
Q 18.	Microbial fuel cells are used to: A. Generate heat B. Produce alcohol C. Convert waste into electricity D. Clean air	1.5	CO3
Q 19.	Enzyme is used in detergents for protein stain removal. A. Amylase B. Lipase C. Protease D. Cellulase	1.5	CO3
Q 20.	What is the main function of probiotics? A. Destroy pathogens B. Improve digestion and gut health C. Cause fermentation D. Produce alcohol	1.5	CO3
	Section B (4Qx5M=20 Marks)		
Q 1.	Discuss various roles of microorganisms in natural and artificial systems?	5	CO2
Q 2.	Discuss the microorganism involved in industrial production of biopolymers.	5	CO2
Q 3.	Describe the fermentation process of production of antibiotics.	5	CO3
Q 4.	Elucidate various strategies involved in strain improvement.	5	CO3
	Section C (2Qx15M=30 Marks)		
Q 1.	I am a researcher who has been working on molecular gene cloning and wants to improve the strain. 1. Discuss in detail how to obtain high yield? 2. Elucidate how gene cloning can improve the strain performance for industrial production of various products? 3. Discuss how recombinant gene technology can improve a strain?	5+5+5	CO2

Q 2.	An industrial production unit of alcoholic beverages needs 1. A suggestion for identification and screening of microorganisms involved in alcoholic beverage production. 2. Describe the downstream processing of alcoholic beverage production. 3. Describe the uses of wine production.	5+5+5	CO3
Section D (2Qx10M=20 Marks)			
Q 1.	 1.1 Explain the above diagram which can be performed by an industrial microbiologist to improve the strain quality? Define the process in detail? 1.2 Defend why there is a proper need for effective strain improvement in Microbial associated productions?	6+4	CO3

Q 2.	 2.1 Discuss the above plating method. Explain the steps involved in the process? 2.2 Elucidate the streak plating method? Discuss the primary, secondary and tertiary inoculum.	5+5	CO2