Name: **Enrolment No:**	

UPES

End Semester Examination, May 2025

Course: Introduction to Microbiology **Semester : II**

Program: B.Sc. Clinical Research **Duration : 3 Hours**

Course Code: HSMB1013P **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	Choose a method not used for preservation of microorganisms: A) Lyophilization B) Glycerol preservation C) Autoclaving D) Mineral oil overlaying	**1.5**	**CO1**
Q 2	Carl Woese's three domain system is based on: A) Cell wall composition B) rRNA sequences C) Morphology D) Metabolic pathways	**1.5**	**CO1**
Q 3	Scientist introduced the concept of chemolithotrophy? A) Louis Pasteur B) Sergei Winogradsky C) Martinus Beijerinck D) Robert Koch	**1.5**	**CO2**
Q 4	Scientist developed the smallpox vaccine: A) Louis Pasteur B) Robert Koch C) Edward Jenner D) Paul Ehrlich	**1.5**	**CO1**
Q 5	The resolving power of a microscope is defined as: A) Ability to distinguish two close points B) Total magnification	**1.5**	**CO2**

	C) Numerical aperture D) Focal length		
Q 6	Component of the bacterial cell determines the shape and provides structural support: A) Plasma membrane B) Ribosome C) Cell wall D) Capsule	**1.5**	**CO2**
Q 7	Choose the method used to differentiate *Mycobacterium* species from other bacteria: A) Gram staining B) Simple staining C) Negative staining D) Acid-fast staining	**1.5**	**CO1**
Q 8	Select a major difference between Archaea and Bacteria: A) Presence of nucleus B) Type of cell wall C) Mode of reproduction D) Presence of ribosomes	**1.5**	**CO1**
Q 9	Numerical aperture in microscopy associated with: A) Lens thickness B) Resolving power C) Magnification D) Focal length	**1.5**	**CO2**
Q 10	Geological era when microbial life first appears: A) Mesozoic B) Cenozoic C) Archean D) Paleozoic	**1.5**	**CO2**
Q 11	Viruses are considered living organisms because they can reproduce independently. (True/False)	**1.5**	**CO1**
Q 12	Protozoa reproduce only by binary fission. (True/False)	**1.5**	**CO2**
Q 13	Algae perform oxygenic photosynthesis like higher plants. (True/False)	**1.5**	**CO3**
Q 14	Fungi can be both unicellular and multicellular. (True/False)	**1.5**	**CO1**
Q 15	Koch's postulates are used to establish a causal relationship between a microbe and a disease. (True/False)	**1.5**	**CO1**
Q 16	Capsules increase the virulence of pathogenic bacteria. (True/False)	**1.5**	**CO2**
Q 17	Protozoa are always multicellular organisms. (True/False)	**1.5**	**CO1**
Q 18	Algae are prokaryotic microorganisms. (True/False)	**1.5**	**CO1**
Q 19	Fungi possess chitin in their cell walls. (True/False)	**1.5**	**CO1**

Q 20	The capsule of bacteria can be stained using Gram stain. (True/False)	**1.5**	**CO2**
	Section B **(4Qx5M=20 Marks)**		
Q 21	Describe the key differences between prokaryotic and eukaryotic microorganisms.	**5**	**CO1**
Q 22	List the main types of locomotion used by protozoa.	**5**	**CO2**
Q 23	Explain the major steps in Koch's postulates.	**5**	**CO1**
Q 24	Discuss two preservation methods for maintaining microbial cultures and explain each in brief.	**5**	**CO1**
	Section C **(2Qx15M=30 Marks)**		
Q 25	**Case study**: Louis Pasteur's Swan-Neck Flask Experiment **Questions:** a) Describe the hypothesis tested by Pasteur with the swan-neck flask experiment. b) How did the design of the flask prevent contamination? c) What was the significance of this experiment in microbiology?	**5+5+5**	**CO3**
Q 26	**Case study**: Edward Jenner's Smallpox Vaccination Trial **Questions:** a) Describe Jenner test to prove hypothesis that cowpox could prevent smallpox. b) Explain the method he used to inoculate the subject. c) Discuss this as a pioneering step in immunology.	**5+5+5**	**CO2**
	Section D **(2Qx10M=20 Marks)**		
Q 27	Explain the classification system proposed by Carl Woese. Compare it with the traditional five-kingdom classification in microbial taxonomy.	**10**	**CO3**
Q 28	Describe the general characteristics of algae and fungi. Compare their cell structures, modes of reproduction, and ecological and economic importance.	**10**	**CO2**