Name: Enrolment No:	

UPES

End Semester Examination, December 2024

Course: Introduction to Microbiology — **Semester:** I

Program: BSC-MICROBIOLOGY — **Duration:** 3 Hours

Course Code: HSMB1011_6 — **Max. Marks:** 100

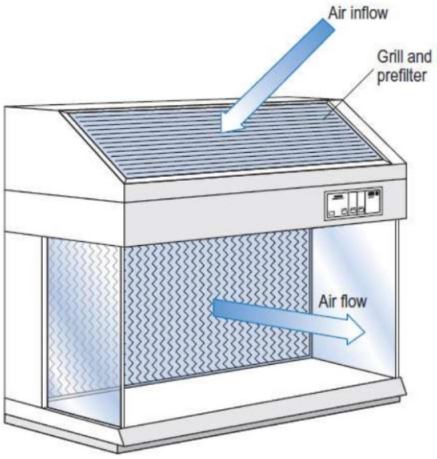
Instructions: "NOT APPLICABLE":

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	**The following statements about the size of microorganisms is most accurate -** A) Most bacteria are larger than most fungi. B) The size of viruses can be smaller than 0.1 µm. C) Protozoa are typically the smallest microorganisms, ranging from 1–5 µm. D) Algae are generally larger than protozoa but smaller than bacteria.	1.5	CO1
Q 2	**The primary function of the resolving power of a microscope is** A) To increase the total magnification of the image B) To determine the clarity of the specimen's color C) To distinguish between two closely spaced objects as separate D) To adjust the brightness of the specimen	1.5	CO3
Q 3	**Viruses are considered acellular microorganisms, select the reason -** A) They have no cells and cannot carry out metabolism on their own. B) They have a simple cellular structure without organelles. C) They can reproduce independently of host cells. D) They contain both DNA and RNA and are unicellular.	1.5	CO2

Q 4	**Considering the fossil evidence of microorganisms and the geological time scale, which of the following best describes the earliest life forms on Earth -** A) They were complex, multicellular organisms that appeared 1 billion years ago. B) They were prokaryotic, unicellular organisms that appeared around 3.5 billion years ago. C) They were large, eukaryotic cells with distinct organelles. D) They were viruses that evolved from larger organisms.	**1.5**	**CO2**
Q 5	**The importance of Joseph Lister's contribution to medical microbiology is that -** A) He was the first to observe bacteria under a microscope. B) He developed a vaccine for tuberculosis. C) He pioneered antiseptic surgery by using carbolic acid to reduce infections. D) He discovered the role of microorganisms in fermentation.	**1.5**	**CO2**
Q 6	**Following was the major conclusion of Louis Pasteur's experiments that disproved the theory of spontaneous generation -** A) Microorganisms spontaneously arise from non-living matter. B) Life only arises from pre-existing life, not from non-living matter. C) Microorganisms are too small to be seen under a microscope. D) Heat can kill all forms of life.	**1.5**	**CO2**
Q 7	**The microorganism is primarily involved in the fermentation of bread -** A) Bacteria B) Protozoa C) Fungi (yeast) D) Viruses	**1.5**	**CO1**
Q 8	**The Scientist credited with developing the germ theory of disease -** A) Joseph Lister B) Robert Koch C) Louis Pasteur D) Anton von Leeuwenhoek	**1.5**	**CO2**
Q 9	**The following microorganisms are obligate intracellular parasites -** A) Mycoplasma B) Rickettsia C) Eubacteria D) Fungi	**1.5**	**CO1**

Q 10	**The role of the prion protein in prion diseases -** A) It contains genetic material that replicates inside host cells. B) It causes the misfolding of other proteins, leading to disease. C) It stores energy for the prion. D) It acts as the cell's protective outer layer.	**1.5**	**CO2**
Q 11	**The following is a key feature of the *Eubacteria* cell wall -** A) It is made of cellulose. B) It is made of peptidoglycan. C) It contains a double membrane. D) It is absent in some species.	**1.5**	**CO2**
Q 12	**The basic difference between the lytic and lysogenic cycles in bacteriophages -** A) The lytic cycle destroys the host cell, while the lysogenic cycle does not. B) Both cycles result in the immediate destruction of the host cell. C) The lytic cycle involves the virus integrating into the host genome. D) The lysogenic cycle results in the production of new viruses.	**1.5**	**CO1**
Q 13	**A characteristic of protozoa is that -** A) They are always multicellular. B) They have a nucleus and can be found in both aquatic and terrestrial environments. C) They lack a nucleus. D) They are autotrophic organisms.	**1.5**	**CO2**
Q 14	**Fungi play an important role in ecosystems as -** A) Producers B) Decomposers C) Consumers D) Parasites	**1.5**	**CO2**
Q 15	**A common method of asexual reproduction in fungi -** A) Spore formation B) Binary fission C) Mitosis D) Conjugation	**1.5**	**CO1**
Q 16	**The fungal cell wall primarily made of -** A) Cellulose B) Chitin C) Proteins D) Pectin	**1.5**	**CO2**
Q 17	**The following methods is commonly used to preserve microorganisms by slowing down their metabolic activities -** A) Freezing	**1.5**	**CO3**

	B) Glycerol preservation C) Lyophilization (freeze-drying) D) All of the above		
Q 18	**One sentence best describes the sterilization is that -** A) Sterilization only kills bacteria. B) Sterilization eliminates all forms of microbial life, including bacterial spores. C) Sterilization is only effective for bacteria. D) Sterilization involves the use of heat but not chemicals.	**1.5**	**CO3**
Q 19	**The capsule staining detects in microorganisms -** A) The presence of flagella B) The presence of a gelatinous outer layer C) The ability to form endospores D) The presence of pili	**1.5**	**CO3**
Q 20	**The microorganisms are best identified using the acid-fast staining technique -** A) Gram-negative bacteria B) Gram-positive bacteria C) Mycobacteria (e.g., *Mycobacterium tuberculosis*) D) Fungi	**1.5**	**CO3**
Section B (4Qx5M=20 Marks)			
Q 1	Discuss the properties of acellular microorganisms and cellular microorganisms. Enlist their examples.	**5**	**CO1**
Q 2	Elucidate the role of Chlamydia & Rickettsia in causing pathogenesis.	**5**	**CO2**
Q 3	Summarize the general characteristics of fungi? Name 3 major fungi.	**5**	**CO2**
Q 4	Categorize the process of sterilization? Distinguish sterilization with disinfection.	**5**	**CO3**
Section C (2Qx15M=30 Marks)			
Q 1	**A person had infections mainly on the oral cavity. He identifies "thrush" on the oral mucosa. He has examined infections and isolated unknown organisms causing the infection in oral cavities. He visualized a kind of hyphal structure in the microscope.** 1. Discuss the kind of infection that person can probably have? 2. Describe hyphae, provide diagrammatic representation? 3. Differentiate a prokaryotic and eukaryotic cellular structure?	**5+5+5**	**CO3**

Q 2	**Two medical researcher named Dr. Jonas Salk and Dr. Albert Bruce Sabin worked for years and developed a vaccine which can be delivered through noninvasive oral route and can effectively prevent paralysis in children.** 1. Provide the name of this vaccine and how it is delivered? 2. Give schematic representation of the virus against which the vaccine is prepared? 3. Differentiate lytic and lysogenic cycles with examples.	**2+6+7**	**CO2**
	Section D **(2Qx10M=20 Marks)**		
Q 1	 Identify the above microbiology laboratory instrument? Discuss Its components and how this instrument in important in maintaining the sterile conditions required in the laboratory.	**10**	**CO3**
Q 2	Discuss the concept of Spontaneous generation. How the concept is different from biogenesis. Describe with examples.	**10**	**CO1**