Name:

Enrolment No:

UPES

End Semester Examination, December 2023

Course: Microbiology **Semester : III**

Program: B. Tech **Duration : 3 Hours**

Course Code: HSMB 2019 **Max. Marks: 100**

Instructions:

1. All the questions are compulsory.
2. Please write down the Serial Number of the question before attempting it.
3. The question paper consists of 28 questions and it is divided into four sections A, B, C and D.
4. Section A comprises of 20 questions carrying 1.5 mark each.
5. Section B comprises of 4 questions carrying 5 marks each.
6. Section C comprises of 2 questions carrying 15 marks each.
7. Section D comprises of 2 questions carrying 10 marks each.

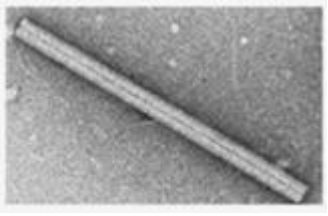
There is no overall choice. However, an internal choice might be provided.

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	Cos
Q 1	Which of the following microbial control methods does not actually kill microbes or inhibit their growth but instead removes them physically from samples? A. filtration B. desiccation C. lyophilization D. nonionizing radiation	**1.5**	**CO2**
Q 2	A Feature that Categorizes a “True Slime Mold” is A. occurs as an independent cell B. a multinucleate plasmodial stage C. secretes mucoidal exudate D. None of the above	**1.5**	**CO1**
Q3	Morels and Truffles fall in class of fungi called ……..	**1.5**	**CO1**

Q4	What do both fungi and algae have in common a) Thallus organization b) Chlorophyll c) Grow at same pH d) Cell wall constituents are same	**1.5**	**CO1**
Q5	Bacteria are a. visible under microscope b. Prokaryotes c. Surrounded by a cell wall d. All of the above	**1.5**	**CO2**
Q6	*'Saccharmomyces* is a fungus that lacks mycelial form and exists as yeast.' Comment on the statement.	**1.5**	**CO1**
Q7	Name a mycelial fungus that forms zygospores.	**1.5**	**CO3**
Q8	Differentiate between fungi and bacteria.	**1.5**	**CO3**
Q9	…… is the algae from which agar is obtained.	**1.5**	**CO3**
Q10	**'**Some algae and fungus are edible.' Comment on the statement.	**1.5**	**CO3**
Q11	The total magnification of a microscope is calculated by: a. Addition of the objective lens and ocular lens magnification powers b. Multiplication of the objective lens and ocular lens magnification powers c. Multiplication of the objective lens and condenser lens magnification powers d. The objective lens power squared e. None of the above	**1.5**	**CO2**
Q12	Which of the following microscopic techniques provide three-dimensional images of a bacterial cell? a. Transmission Electron Microscopy b. Scanning Electron Microscopy c. Negative staining microscopy d. Dark-field microscopy e. Fluorescent microscopy	**1.5**	**CO2**
Q13	Morels and Truffles fall in class of fungi called ……..	**1.5**	**CO3**
Q14	The transmission electron microscope has the greatest resolving power because it uses an electron beam to view the sample instead of a light beam. The electron beam is used because a. Electrons have longer wavelengths than light waves b. Electrons do not penetrate the sample c. Light waves are less visible	**1.5**	**CO2**

	d. Electrons have shorter wavelengths than light waves e. Electrons are less invasive.		
Q15	Which stains are frequently used to identify mycobacterium and other bacteria whose cell walls contain high amounts of lipids? a. Gram stain b. Schaeffer-Fulton stain c. Acid-fast stain d.Giemsa Stain e. Spore stain	**1.5**	**CO2**
Q16	Which of the following contains structures composed of N-acetylmuramic acid and N- acetylglucosamine? a. Mycoplasmas b. Amoeba c. E.coli d. Spheroplast	**1.5**	**CO1**
Q17	Which of the statements regarding gram staining is wrong? a. *Mycobacterium tuberculosis* stains blue because of the thick lipid layer b. *Streptococcus pyogenes* stains blue because of a thick peptidoglycan layer c. *Escherichia coli* stains pink because of a thin peptidoglycan layer d. *Mycoplasma pneumoniae* is not visible in the Gram's stain because it has no cell wall	**1.5**	**CO1**
Q18	Prokaryotic cells are more resistant to osmotic shock than eukaryotic cells because a. They have impervious cell wall composed of peptidoglycan b. They are selectively permeable c. They contain osmoregulating porins d. The statement is false, eukaryotic cells are more resistant	**1.5**	**CO1**
Q19	What is the approximate size of the bacterial cell? a) 1mm in diameter	**1.5**	**CO1**

	b) 0.5 to 1.0 micrometer in diameter c) 2mm in diameter d) 2 micrometer in diameter		
Q20	The respiratory chain of bacteria is associated with the _____ a) cytoplasmic membrane b) cell wall c) cytoplasm d) mitochondrial membrane	**1.5**	**CO1**
	Section B **(4Qx5M=20 Marks)**		
Q 1	Differentiate between SEM and TEM.	**5**	**CO2**
Q2	Draw ray diagram of simple light microscope and explain a little bit of it parts.	**5**	**CO2**
Q3	Classify algae. Enlist economic importance of algae.	**5**	**CO1**
Q4	A mycologist found a coenocytic hypha growing on bread. He looked under microscope and found black spores. Which fungus is it likely to be. What are important features of this family of fungi.	**5**	**CO3**
	Section C **(2Qx15M=30 Marks)**		
Q 1	There were microbes growing on barren land and suddenly after a setup of industry nearby; it first became white colored and then they vanished. There not many humans living in that area. Given this; answer the following: (i) What was this microbial association growing on barren land? (1) (ii) Why did it stop growing? (1) (iii) Name the partners in this association. (2) (iv) What is the economic importance of this association? (2) (v) What is the ecological significance of this association? (2) (vi) Describe this association and its types. (7)	**15**	**CO1**

Q2	A sample of soil has been collected from different parts of the world to test for presence of various microorganisms. (i) How would you go about finding out diversity of microorganism in this sample? (1) (i) What is the principle behind the technique that answers question (i)? (3) (ii) Having known the diversity; how would you culture different microorganisms in this sample such as bacteria, virus, fungus, protist, and algae? (5) (iii) Give examples of gram negative, gram positive bacteria, a red alga, a ciliated protist, a flagellated protist and an shapeless protist.(3) (iv) Enlist various methods of horizontal transfer in bacteria and write a line describing each. (3)	**15**	**CO3**
	Section D **(2Qx10M=20 Marks)**		
Q 1	Give an account of sterilization by radiation (7). Distinguish between mode of action of ionizing and non-ionizing radiation (3). OR Give an account of sterilization by chemical agents (7). Distinguish between mode of action of ionizing and non-ionizing radiation (3).	**10**	**CO2**
Q2	Based on the picture; answer the following;  (i) What is shown in the picture? (1) (ii) What kind of microscopy is it? (1) (iii) Illustrate and write the experiment that gave evidence that RNA is the genetic material in viruses. (7) (iv) In which virus was it conducted? (1)	**10**	**CO2**