

Name:

Enrolment No:



UPES

End Semester Examination Dec – 2024

Program Name: MSc Microbiology

Semester : I

Course Name: Microbial Diversity and Taxonomy

Time : 3 hrs

Course Code: HSMB7034

Max. Marks : 100

Nos. of page(s): 2

Instructions:

Answer all the questions after carefully going through the instructions. Support answers with flow-charts and labelled diagrams wherever necessary.

S. No.	Section A	Marks	COs
	<b>Short answer questions/ MCQ/T&amp;F (20Q x 1.5M = 30 Marks)</b>		
Q1	Define Taxon.	1.5	CO1
Q2	Mention importance of isoprenoid quinones as a tool in taxonomy.	1.5	CO1
Q3	Define alpha-diversity.	1.5	CO2
Q4	Define beta-diversity.	1.5	CO2
Q5	Mention a key chemotaxonomic marker to differentiate between Archea and Bacteria.	1.5	CO3
Q6	Enlist the three domains of life inferred from phylogenetic analysis of rRNA.	1.5	CO1
Q6	State the correct taxonomic hierarchy of <i>E. Coli</i> .	1.5	CO2
Q7	Mention an example of NGS method.	1.5	CO1
Q8	Briefly state the purpose of catalase test.	1.5	CO1
Q9	State the principle of Indole test.	1.5	CO1
Q10	Mention a representative genera of beta-proteobacteria that contains many mammalian commensals and important human pathogens.	1.5	CO1
Q11	Enlist phylogenetic markers for identification of Fungi.	1.5	CO2
Q12	State the purpose of CARD-FISH.	1.5	CO3
Q13	Mention the utility of EMB medium.	1.5	CO2
Q14	ATCC stands for _____.	1.5	CO1
Q15	State the correct taxonomic hierarchy of <i>Penicillium</i> .	1.5	CO3
Q16	Mention an example of Purple-sulfur bacteria.	1.5	CO1
Q17	State typical absorbance characteristics of bacteriochlorophyll <i>a</i> .	1.5	CO2
Q18	State the difference between Chlorosomes and Carboxysomes.	1.5	CO2
Q19	Mention an example of fungi that produces aflatoxins.	1.5	CO2
Q20	State the utility of Simpson's Diversity Index.	1.5	CO1

<b>Section B</b> <b>(4Qx5M=20 Marks)</b>			
<b>Q1</b>	Discuss possible reasons why most prokaryotes in a soil or water sample remains to be unculturable.	<b>5</b>	<b>CO3</b>
<b>Q2</b>	Explain the concept of species divergence. Enlist the techniques for measurement of microbial diversity.	<b>5</b>	<b>CO3</b>
<b>Q3</b>	Describe the importance of FAME profiling in bacterial taxonomy.	<b>5</b>	<b>CO2</b>
<b>Q4</b>	Explain salient features of Basidiomycetes.	<b>5</b>	<b>CO1</b>
<b>Section C</b> <b>(2Qx15M=30 Marks)</b>			
<b>Q1</b>	Design an experiment to assess the culturable and unculturable diversity of bacteria from a soil sample.	<b>15</b>	<b>CO3</b>
<b>Q2</b>	(a) Describe Salient features of protozoa. (05 marks) (b) Discuss the life cycle of <i>Plasmodium</i> with help of labelled diagram. (10Marks)	<b>15</b>	<b>CO1</b>
<b>Section D</b> <b>(2Qx10M=20 Marks)</b>			
<b>Q1</b>	Describe and outline methodology for identification of unknown bacterial cultures as per present ICSP guidelines.	<b>10</b>	<b>CO2</b>
<b>Q2</b>	Enlist and describe different molecules used as molecular clocks in bacterial taxonomy and discuss their importance.	<b>10</b>	<b>CO3</b>