

<b>Name:</b>	
<b>Enrolment No:</b>	

**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): 3**

**Instructions:**  
1) Answer all the questions after carefully going through the instructions.  
2) Support answers with flow-charts and labelled diagrams wherever necessary.

S. No.	Section A Short answer questions/ MCQ/T&F (20Q x 1.5M = 30 Marks)	Marks	COs
<b>Q 1</b>	Mention the causative agent of <i>Leishmaniasis</i> .	<b>1.5</b>	<b>CO1</b>
<b>Q2</b>	The correct order of taxonomic groups from higher to lower rank is: (a) Kingdom—Order—Class—Family (b) Order—Class—Division—Family—Genus—Species (c) Kingdom—Order—Division—Family—Class—Genus—Species (d) Kingdom—Phylum—Class—Order—Family—Genus—Species	<b>1.5</b>	<b>CO1</b>
<b>Q3</b>	Mention an example of prokaryotes that lack cell wall.	<b>1.5</b>	<b>CO1</b>
<b>Q4</b>	Mention key phylogenetic markers to identify prokaryotes.	<b>1.5</b>	<b>CO2</b>
<b>Q5</b>	Name the scientist who proposed the phylogenetic tree for living things. (a) Carlo Urbani (b) Louis Pasteur (c) Robert Koch (d) Carl Woese	<b>1.5</b>	<b>CO1</b>
<b>Q6</b>	Identify the genera that typically represents pleomorphic cells: (a) <i>Mycobacteria</i> (b) <i>Streptococcus</i> (c) <i>Pseudomonas</i> (d) <i>Corynebacterium</i>	<b>1.5</b>	<b>CO1</b>
<b>Q6</b>	Acid present in the cell wall of bacteria which helps in retaining its color during the acid-fast test? (a) Mycolic acid (b) Teichoic acid (c) Malic acid (d) Tartaric acid	<b>1.5</b>	<b>CO1</b>
<b>Q7</b>	Define Candidatus species.	<b>1.5</b>	<b>CO2</b>

<b>Q8</b>	Define metagenomic library.	<b>1.5</b>	<b>CO1</b>
<b>Q9</b>	Mention a key chemotaxonomic test that can differentiate between bacteria and archaea.	<b>1.5</b>	<b>CO3</b>
<b>Q10</b>	Define great plate count anomaly.	<b>1.5</b>	<b>CO1</b>
<b>Q11</b>	State the utility of Simpson's Diversity Index.	<b>1.5</b>	<b>CO1</b>
<b>Q12</b>	Mention the correct taxonomic hierarchy of <i>E. Coli</i> .	<b>1.5</b>	<b>CO2</b>
<b>Q13</b>	MTCC stands for _____.	<b>1.5</b>	<b>CO1</b>
<b>Q14</b>	Updated guidelines of ICSP to infer phylogenetic assignments of prokaryotes is: (a) Bergey's manual of systematic bacteriology. (b) Bergey's manual of determinative bacteriology. (c) Bergey's manual of systematics of Archaea and Bacteria. (d) Bergey's manual of determinative microbiology.	<b>1.5</b>	<b>CO1</b>
<b>Q15</b>	In the fungal classification system Ascomycetes come under the division of: (a) Gymnomycota (b) Mastigomycota (c) Amastigomycota (d) Gymnomycota	<b>1.5</b>	<b>CO2</b>
<b>Q16</b>	<i>Rhizopus stolonifer</i> belongs to which class? (a) Acrasiomycetes (b) Zygomycetes (c) Ascomycetes (d) Deuteromycete	<b>1.5</b>	<b>CO1</b>
<b>Q17</b>	Fruiting bodies of slime moulds are called _____ (a) acervulus (b) sori (c) apothecium (d) perithecium	<b>1.5</b>	<b>CO2</b>
<b>Q18</b>	Mention an example of fungi that produces aflatoxins.	<b>1.5</b>	<b>CO2</b>
<b>Q19</b>	Extensive sequential nucleotide analysis and analysis of rRNA has divided the living world into three domains called: (a) bacteria, archaea and eucarya. (b) procarya, eucarya and animals. (c) fungi, plants and animals. (d) archaea, eucarya and viruses. (e) bacteria, archaea and cyanobacteria.	<b>1.5</b>	<b>CO2</b>
<b>Q20</b>	Define a taxon.	<b>1.5</b>	<b>CO1</b>

<b>Section B</b> <b>(4Qx5M=20 Marks)</b>			
<b>Q1</b>	Explain the concepts of alpha and beta diversity with examples.	<b>5</b>	<b>CO1</b>
<b>Q2</b>	Describe the salient characteristics of class Ascomycota.	<b>5</b>	<b>CO2</b>
<b>Q3</b>	Explain the principles of IMViC tests and their importance.	<b>5</b>	<b>CO2</b>
<b>Q4</b>	Design an experiment to study the diversity of anaerobes from soil.	<b>5</b>	<b>CO3</b>
<b>Section C</b> <b>(2Qx15M=30 Marks)</b>			
<b>Q 1</b>	Describe and compare electron flows of anoxygenic and oxygenic phototrophic prokaryotes that drives ATP synthesis and generates reducing power.	<b>15</b>	<b>CO3</b>
<b>Q2</b>	Discuss and outline the key steps of polyphasic taxonomy required for nomenclature of a new species.	<b>15</b>	<b>CO2</b>
<b>Section D</b> <b>(2Qx10M=20 Marks)</b>			
<b>Q1</b>	Mention the main classes of phylum Pseudomonadota and discuss in details the key taxonomic characteristics of the phylum $\gamma$ -proteobacteria.	<b>10</b>	<b>CO2</b>
<b>Q2</b>	Discuss the life cycle of <i>Plasmodium</i> with help of a labelled diagram.	<b>10</b>	<b>CO3</b>