

**Note:** (a) All questions are compulsory. (b) Calculators are **NOT ALLOWED**

Q. No.	Question	Marks															
Q1.	<b>Case Study:</b> A microbiology student is attempting to culture a newly isolated bacterium. When grown on <u>minimal medium</u> , the organism fails to grow. However, when the minimal medium is supplemented with <b>Vitamin B1 (thiamine)</b> , the bacterium shows good growth.																
	1. What type of medium is minimal medium: synthetic or complex? Differentiate between the two with example.	[2]															
	2. Predict why Vitamin B1 supplementation was necessary for growth in this case?	[1]															
	3. How can such experiments using minimal medium, be used for determining the nutritional requirements of unknown bacteria?	[2]															
Q2.	Q4. Calculate the CFU of the bacteria present in each soil sample from the following data; 100µl of diluted sample was used for plating each time.																
	<table border="1"> <thead> <tr> <th>Sample No.</th><th>Dilution Factor</th><th>No. of colonies</th></tr> </thead> <tbody> <tr> <td>Sample 1</td><td>-4</td><td>48, 60, 80</td></tr> <tr> <td>Sample 2</td><td>-6</td><td>54, 78, 378</td></tr> <tr> <td>Sample 3</td><td>-8</td><td>Not-countable</td></tr> <tr> <td>Sample 4</td><td>-10</td><td>0, 2</td></tr> </tbody> </table>	Sample No.	Dilution Factor	No. of colonies	Sample 1	-4	48, 60, 80	Sample 2	-6	54, 78, 378	Sample 3	-8	Not-countable	Sample 4	-10	0, 2	[4]
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Q3.	Discuss Koch's postulates with suitable diagrams; discuss its significance in the development of medical microbiology.	[4]															
Q4.	Compare the advantages, limitations and application of Pour Plate and Spread Plate Methods.	[2]															