



**UNIVERSITY OF PETROLEUM AND ENERGY
STUDIES**

End Semester Examination, December 2021

Course: Bacteriology and Virology

Program: MSc. Microbiology

Course Code: HSMB7023

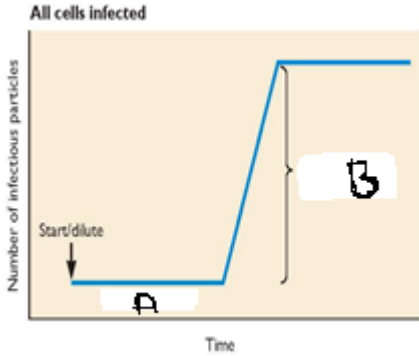
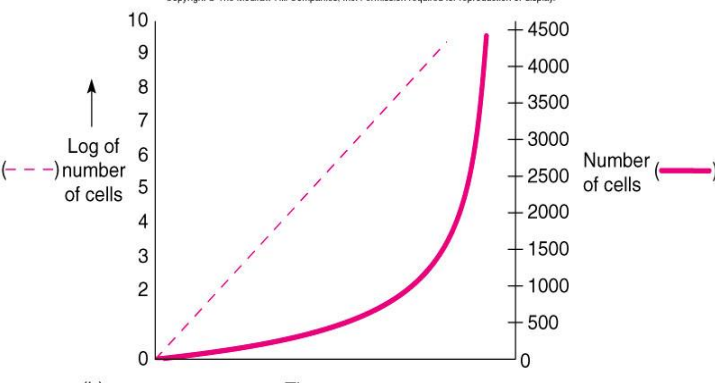
Semester: I


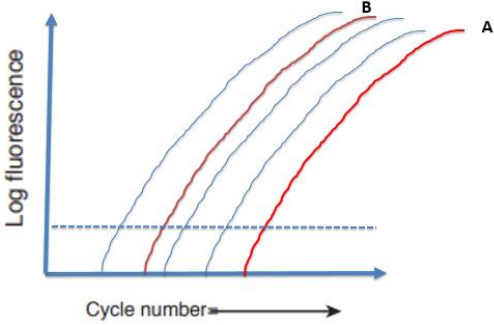
Duration: 03 hrs.

Max. Marks: 100

Instructions:

	SECTION A (Type the answers in test box)	(20Q x1.5M= 30 Marks)	CO
	MCQs or Fill in the blanks	1.5	
Q1	----- is an enzyme which breaks linkages between peptidoglycan of bacterial cell wall.	1.5	CO1
Q2	----- is an example of two component system in bacteria.	1.5	CO3
Q3	The following viruses carry their own RNA polymerases a) Corona viruses b) Pox viruses c) Influenza viruses d) Retroviruses	1.5	CO5
Q4	-----, ----- and ----- are three domains of life.	1.5	CO1
Q5	“Genome of retroviruses can be used for translation directly.” a. True b. False	1.5	CO3
Q6	“Some viruses carry their own machinery for translation”. a. True b. False	1.5	CO6
Q7	Identify the most relevant antibiotic for treating unknown bacterial infection a) Tetracycline b) Rifampicin c) Penicillin d) Isoniazid	1.5	CO2
Q8	----- is a cell membrane targeting antibiotic.	1.5	CO2
Q9	----- is a radiation resistant bacteria.	1.5	CO2
Q10	----- are autoinducers in gram negative bacteria.	1.5	CO3
Q11	----- is a viroid.	1.5	CO5
Q12	Rolling circle mechanism is observed in -----.(name one virus)	1.5	CO5
Q13	What is the capsid symmetry of corona viruses?	1.5	CO3

Q14	<p>Name the technique shown below called? Label the two phases A and B.</p> 	1.5	CO1
Q15	<p>Certain bacteria, pleomorphic in shape forms fried egg colonies was exposed to hypotonic medium. What is expected to happen?</p> <p>a) Bacterial cells will shrink b) Bacteria cells will remain as it is c) Bacteria will lyse d) Bacteria will accumulate salt</p>	1.5	CO2
Q16	<p>“Bacteria reproduce by most commonly by budding”.</p> <p>a. True b. False</p>	1.5	CO3
Q17	<p>“DNA replication is primer dependent”.</p> <p>a) True b) False</p>	1.5	CO5
Q18	Name a differential media for bacterial culture.	1.5	CO2
Q19	----- is the secretion system which is involved in DNA transport.	1.5	CO3
Q20	A drug was to be given to treat bacterial infection; at a conc. of 128 µg/ml; the bacteria did not grow in culture. After few hours fresh media without antibiotic was added and the bacteria started to grow. What is this concentration of drug called scientifically?	1.5	CO2
SECTION B (Scan and upload)		(4Qx5M=20 Marks)	CO
Short Answer Type Question (5 marks each)			
Q1	What are two component systems and why are they called so? Give a brief account of any two component system.	5 (2+3)	CO3
Q2	<p style="font-size: small;">Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.</p> 	5 (2.5+2.5)	CO2

	Explain the two kinds of plots shown above with view of what do they depict and what can we infer from them?		
Q3	What are fusion proteins in viruses? What are their types? What are fusion inhibitors? Give an example.	5 (1+1+2+1)	CO1
Q4	What are nucleic acid vaccines? What are their advantages and disadvantages?	5 (1+4)	CO6
	SECTION C (Scan and upload)	(2Qx15M=30 Marks)	CO
	Two case studies 15 marks each subsections		
Q1	 <p>There are three tubes above; with motile bacteria and non-motile bacteria. This is agar motility test. Given this; answer the following questions:</p> <ol style="list-style-type: none"> Label the tubes with motile and non-motile bacteria. (1M) In an experiment, bacteria were motile, then upon addition of antimicrobial agent, an appendage was not formed and therefore bacteria lost motility. Name this appendage and explain structure of this appendage. (6M) Explain how this appendage aids in chemotaxis. (4M) What are the positive and negative controls that one should keep in this experiment and explain why? (4M) 	15	CO1
Q2	 <p>A protein was detected by ELISA as corona virus antigen (Test 1). A second test was done which gave the graph above. Here, two samples were tested together A and B (Test 2, picture shown above). Others in blue line are controls. Answer the following questions based on this information.</p>	15	CO6

	<p>i. What was used as a sample in Test 1 and what sample could have been used for Test 2? (2 Marks)</p> <p>ii. Which test can confirm better that its SARS COV-2 and not other corona viruses. Why do you think so? (3 Marks)</p> <p>iii. Name what is Test 2 (picture shown below). Where is this technique often used? (2 Marks)</p> <p>iv. What does the following graph tell about sample A and sample B? (3 Marks)</p> <p>v. Using another protein based method you want to confirm your ELISA results. What would you use? (1 Mark)</p> <p>vi. Explain any one method in detail Test 1 or Test 2 and what controls should be included. (4 Marks)</p>		
	SECTION- D (Scan and upload)	(2Qx10M=20 Marks)	CO
	Long Answer type Question		
Q1	<p>Give an account of pathways of assembly of viruses with suitable examples and illustrations.</p> <p style="text-align: center;">OR</p> <p>Explain what are general secretion systems in bacteria with suitable examples and illustrations.</p>	10	CO4
Q2	Define quorum sensing (QS). What are the key differences between gram negative and gram positive quorum sensing? Explain any one QS system.	10	CO3