

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2022

Course: Bacteriology and Virology

Program: MSc. Microbiology

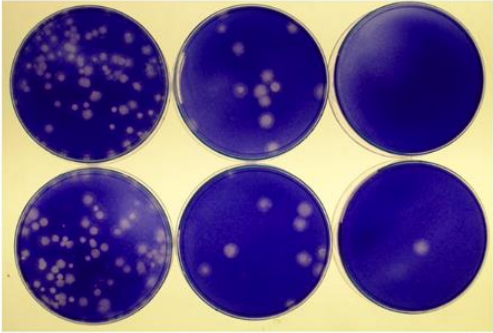
Course Code: HSMB7009

Semester : I

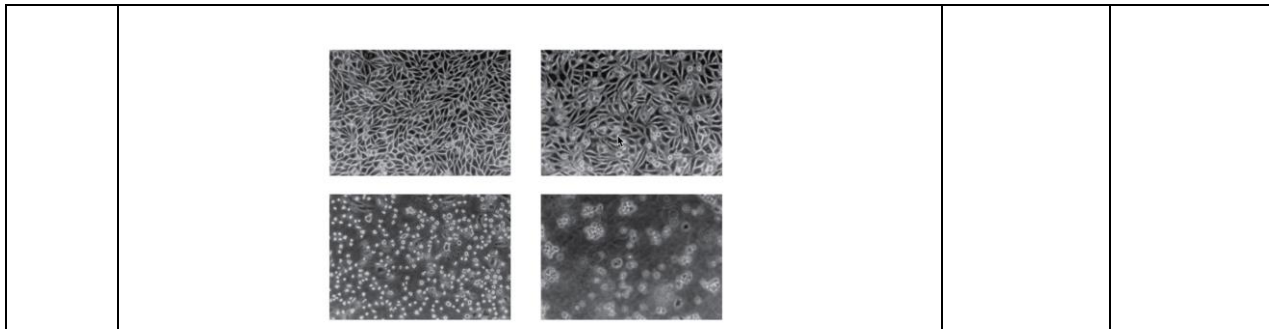
Duration : 3 Hours

Max. Marks: 100

Instructions:

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	Identify the most relevant antibiotic for treating unknown bacterial infection a) Tetracycline b) Rifampicin c) Penicillin d) Isoniazid	1.5	CO2
Q 2	----- is a radiation resistant bacterium.	1.5	CO1
Q 3	Name the technique shown below and what is it used for? 	1.5	CO3
Q 4	Certain bacteria, pleomorphic in shape forms fried egg colonies was exposed to hypotonic medium. What is expected to happen? a) Bacterial cells will shrink b) Bacteria cells will remain as it is c) Bacteria will lyse d) Bacteria will accumulate salt	1.5	CO1
Q 5	'Luria broth is a differential media.' Comment on the statement.	1.5	CO1
Q 6	----- is an enzyme which breaks linkages between peptidoglycan of bacterial cell wall.	1.5	CO1

Q 7	The following viruses carry their own RNA polymerases a) Corona viruses b) Pox viruses c) Influenza viruses d) Retroviruses	1.5	CO4
Q 8	----- is the secretion system which is involved in DNA transport.	1.5	CO3
Q 9	‘Viruses bring translation machinery of their own.’ Comment on the statement.	1.5	CO4
Q 10	In viruses, enveloped is derived from A) Cellular membranes including of organelles B) Host cell membrane C) Viral encoded lipids D) All of the above	1.5	CO5
Q 11	The term Prion was coined by A) Peter Walter B) Ron Walter C) Stanley Prusiner D) None of the above	1.5	CO3
Q 12	Reverse transcriptase was discovered by ----- and ----- for which they got nobel prize in 1975. A) Rosalind Franklin and Maurice Wilkins B) Frankel Conrat and Singer C) Howard Martin Temin and David Baltimore D) Hershey and Martha Chase	1.5	CO4
Q 13	‘Plant viruses require specific receptor to enter plants much like animal viruses.’ Comment on the statement.	1.5	CO4
Q 14	‘Viruses can be crystalized.’ Comment on the statement.	1.5	CO4
Q 15	‘Are there any characteristics of cell that lead to productive viral infection.’ Please comment.	1.5	CO4
Q 16	Define Hemagglutination. Where is it used?	1.5	CO4
Q 17	AZT or Azidothiamidine is an inhibitor of	1.5	CO6
Q 18	Any advantages of visualizing viruses through cryo EM than just EM.	1.5	CO4
Q 19	‘There are 10^8 plaque forming units and 10^7 cells.’ What is the probable multiplicity of infection?	1.5	CO5
Q 20	Can you explain in few lines as to what is happening to cells below?	1.5	CO5

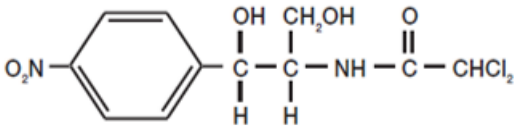


Section B
(4Qx5M=20 Marks)

<p>Q 1</p>	<p>Name and explain the technique shown below.</p>	<p align="center">5</p>	<p align="center">CO5</p>
<p>Q 2</p>	<p>What is chemotherapy? What is therapeutic index of antimicrobial? (1+2) Why is it so difficult to treat fungal infections compared to bacterial (2)?</p>	<p align="center">5</p>	<p align="center">CO3</p>
<p>Q 3</p>	<p>Differentiate between a gram positive and gram-negative cell wall.</p>	<p align="center">5</p>	<p align="center">CO1</p>
<p>Q 4</p>	<p>‘In a tube, bacterial culture is and a capillary is inserted from above with serine gradient.’ What is expected to happen? What are reasons behind it? Explain this phenomenon.</p>	<p align="center">5</p>	<p align="center">CO1</p>

Section C
(2Qx15M=30 Marks)

<p>Q 1</p>	<p>A drug was to be given to treat bacterial infection; at a conc. of 228 µg/ml; the bacteria did not grow in culture. After few hours fresh media without antibiotic was added and the bacteria did not grow. (i) What is this concentration of drug called scientifically? (1)</p>	<p align="center">15</p>	<p align="center">CO3</p>
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	<p>(ii) How do you classify antibiotics? Name the classes. (5)</p> <p>(iii) Name the class of antibiotic given below and explain its mode of action. (3) Explain the reason for its selectivity.</p> <div style="text-align: center;">  </div> <p>(iv) What is disc-diffusion? Explain the Kirby-Bauer disc diffusion method (5).</p>		
Q 2	<p>An HIV patient was given HAART. He stopped responding to it after some time. Give this answer the following:</p> <p>(i) Expand HAART. (1)</p> <p>(ii) Give reasons as to why HAART therapy has failed? (4)</p> <p>(iii) What are nucleoside inhibitors? Give examples and explain how they act? (5)</p> <p>(iv) What are other modes of action of antiviral drugs other than nucleoside inhibitors. Give examples and explain at least one. (5)</p>	15	CO6
<p>Section D (2Qx10M=20 Marks)</p>			
Q 1	<p>Explain Baltimore scheme (6). Give appropriate examples (3). What is the scheme centered around? (1M)</p>	10	CO5
Q 2	<p>Define Quorum sensing (1). Where is it used? (1) What are various Quorum sensing systems? (5)</p> <p>Highlight few differences in quorum sensing between gram-positive and gram-negative bacteria. (3)</p>	10	CO3