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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

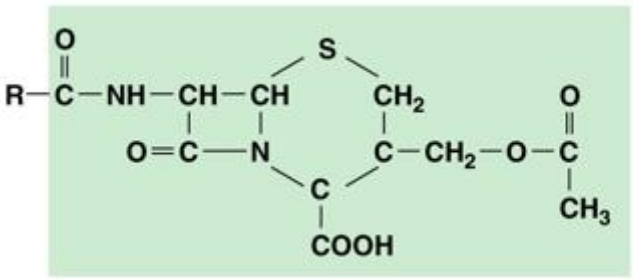
End Semester Examination, December 2021

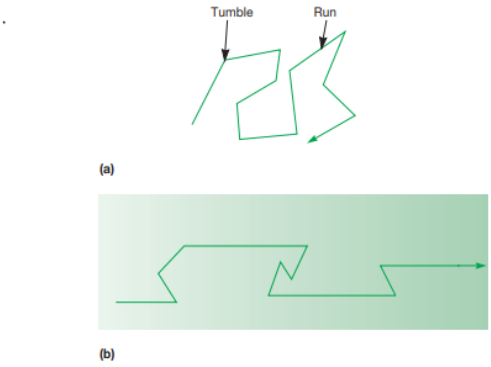
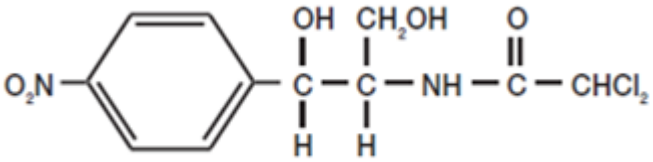
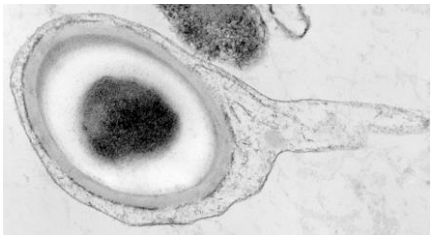
Course: Bacteriology **Semester: III**

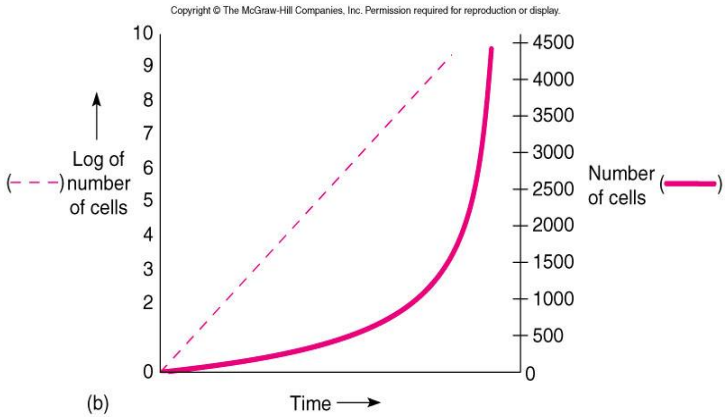
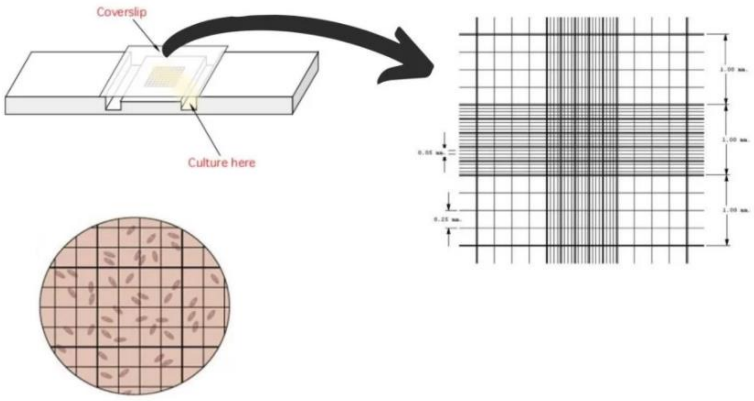
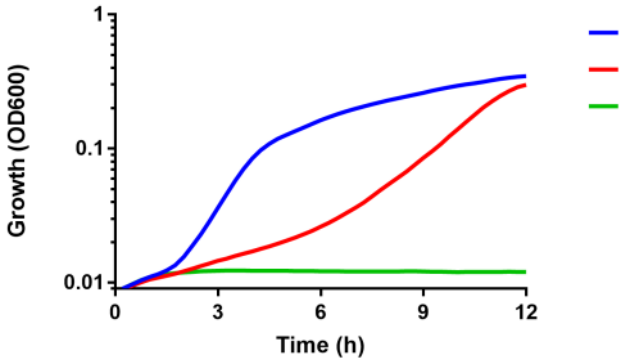
Program: B.Sc. Microbiology (Bacteriology) **Duration: 03 hrs.**

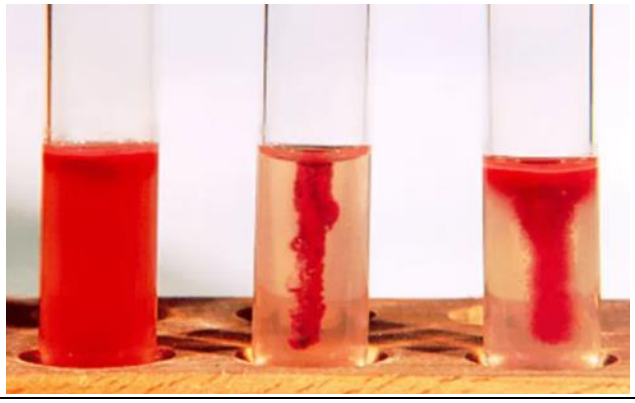
Course Code: HSMB 2003 **Max. Marks: 100**

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.	**1.5**	**CO3**
Q3	----------, ---------- and ---------- received nobel prize for discovery and fermentation of Penicillin.	**1.5**	**CO2**
Q4	Pick the most relevant antibiotic for treating unknown bacterial infection a) Tetracycline b) Rifampicin c) Penicillin **d)** Isoniazid	**1.5**	**CO2**
Q5	---------- is a cell membrane targeting antibiotic.	**1.5**	**CO2**
Q6	---------- is a radiation resistant bacteria.	**1.5**	**CO3**
Q7	---------- are autoinducers in gram negative bacteria.	**1.5**	**CO3**
Q8	---------- are autoinducers in gram positive bacteria.	**1.5**	**CO3**
Q9	Bioluminescence is seen in ---------- (Name the bacteria).	**1.5**	**CO3**
Q10	See the image below and answer what type of antibiotic is it? 	**1.5**	**CO2**
Q11	----------, ---------- and ---------- are three domains of life.	**1.5**	**CO1**
Q12	In facilitated diffusion a type of membrane proteins are used called ----------	**1.5**	**CO2**
Q13	Explain the figure in two words Figure (a) shows ---------- and Figure (b) shows ----------	**1.5**	**CO3**

			
Q14	Bacteria live in dilute environments with iron deficiency; what do they secrete to sequester iron from environment? A) Lipoproteins B) Permeases C) Siderophores D) None of the aboves	**1.5**	**CO2**
Q15	Bacteria commonly reproduce by ----------	**1.5**	**CO3**
Q16	Pick the target of the following antibiotic:  A) Nucleic acid B) Cell wall C) Cell membrane D) Ribosome	**1.5**	**CO3**
Q17	Carl Woese method of phylogenetic classification deals with typing of ---------- of bacteria	**1.5**	**CO1**
Q18	Two types of media based on knowledge of components are ---------- and ----------	**1.5**	**CO2**
Q19	Name a comma shaped and a circular bacteria.	**1.5**	**CO1**
Q20	Bacillus and Clostridium are both ---------- (name one common feature).	**1.5**	**CO1**
	SECTION B **(Scan and upload)**	**(4Qx5M=20 Marks)**	**CO**
Q	Short Answer Type Question (5 marks each)	**5M**	
Q1	What is the image below? Explain the steps leading to its formation. 	**5M**	**CO1**

Q2	Explain the two kinds of plots below  	**5M**	**CO2**
Q3	Name the technique below. What is it used for?  	**5 M**	**CO2**
Q4	Differentiate between Batch and continuous growth.	**5M**	**CO2**
	SECTION C **(Scan and upload)**	**(2Qx15M=30 Marks)**	**CO**
	Two case studies 15 marks each subsections		
Q1	 Bacterial species were grown in three types of media giving rise to three curves shown (blue, green and red) in figure; one with no antibiotic, one with low conc. and third with high conc. of antibiotic : (i) Label the curves accordingly. Mark no antibiotic, low antibiotic conc. and high antibiotic conc. curves (4.5 M) (ii) What is the concentration of antimicrobial at which microbe does not grow called? (1.5 M) (iii) What is an antibiotic, give examples. (2M) (iv) What are different types of antibiotics and the mechanisms of resistance? (7M)	**15 M**	**CO3**

Q2	There are three tubes below; with motile bacteria and non-motile bacteria. This is agar motility test. Given this answer the following: a) Label the tubes with motile and non-motile bacteria. (3M) b) In an experiment, bacteria was motile, then upon addition of antimicrobial agent, an appendage was not formed and therefore bacteria lost motility. Name and explain structure of this appendage. (5M) c) Explain how this appendage aids in chemotaxis. (4M) **d)** What are the positive and positive controls that one should keep in this experiment. (3M) 	**15 M**	**CO1**
	SECTION- D **(Scan and upload)**	**(2Qx10M=20 Marks)**	**CO**
	Long Answer type Question		
Q1	(i) What are factors affecting growth of bacteria. (5M). Explain how oxygen concentration affects growth of microbes. (5M)	**10 M**	**CO2**
Q2	(ii) With the help of illustrations; explain structural details of bacterial cell wall (both gram positive and gram negative, (7M) and give key differences between bacteria and Archaea (3M)	**10 M**	**CO1**