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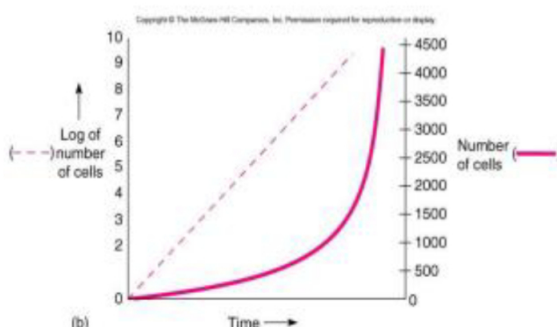
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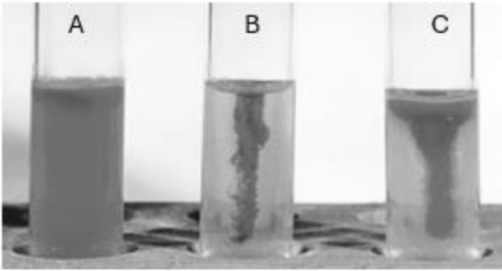
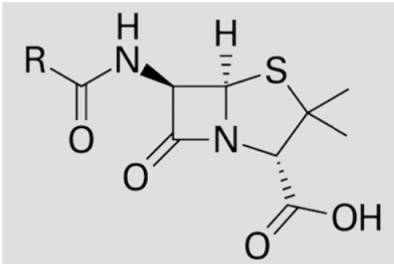
End Semester Examination, December 2024

Course : Bacteriology	Semester : I
Program : MSC-MICROBIOLOGY	Duration : 3 Hours
Course Code: HSMB 7035	Max. Marks:100

Instructions: All questions are compulsory.
Please read the questions carefully. The paper contains four sections

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	Spot amongst the following the part of the cell which is least useful in genotypic typing of bacteria a. Capsule b. DNA c. RNA d. Ribosomes	1.5	CO2
Q2	Discover the incorrect statement from the following a. <i>Escherichia coli</i> stains pink because it has a thin peptidoglycan layer b. <i>Streptococcus pyogenes</i> stains blue because it has a thick peptidoglycan layer c. <i>Mycobacterium tuberculosis</i> stain blue because it has a thick lipid layer d. <i>Mycoplasma pneumoniae</i> is not visible in the Gram's stain because it does not have a cell wall	1.5	CO2
Q3	Pick the correct answer. In <i>E. coli</i> , the conjugation takes place at a. Pili b. Flagella c. Stalk d. Cell membrane	1.5	CO1
Q4	Enzyme hydrolyzing bacterial cell wall a. Lysozome b. Reductase c. Protease d. Lysozyme	1.5	CO1
Q5	Spot the correct answer. Secretion systems are very often observed in a) Both gram types of bacteria b) Viruses c) Gram positive bacteria d) Gram negative bacteria	1.5	CO2
Q6	Spot the organism/s where nucleus is absent a. Bacteria b. Archaea c. Plants d. Protozoan	1.5	CO1
Q7	Arrange the following based on survival during extreme conditions, with the best survivor first Bacteria, Archaea, Fungus	1.5	CO2
Q8	Cite an example with the use of selective media.	1.5	CO2

Q9	Describe what are Hopanoids.	1.5	CO2
Q10	Summarize the main points of similarity between archaea and eukaryotes	1.5	CO2
Q11	Identify, which is the following has two membranes a. Gram negative b. Gram positive c. Mitochondria d. Both a and c	1.5	CO1
Q12	Recognize which of the following is pleomorphic a. Virus b. Mycoplasma c. Mycobacteria d. Staphylococcus	1.5	CO2
Q13	Arrange in order of increasing toughness of the surface of the cell: Cyst, Protozoa , Endospore, Bacteria	1.5	CO1
Q14	Explain the chemical composition of endotoxin.	1.5	CO1
Q15	Cite where is endotoxin found.	1.5	CO2
Q16	Secretion systems are involved in a. Secretion of endotoxin b. Secretion of exotoxin c. Conjugation d. Both a and b e. Both a, b and c	1.5	CO3
Q17	Name the appendage for motility in bacteria.	1.5	CO2
Q18	Differentiate between static and cidal antibiotic.	1.5	CO3
Q19	Gas vacuoles help in maintaining buoyancy. Comment on the statement.	1.5	CO2
Q20	Write the full form of FAME. Where is it used in bacteriology?	1.5	
Section B (4Qx5M=20 Marks)			
Q21	Explain the two kinds of plots showing bacterial growth below deducing the difference between the two. 	5	CO2
Q22	a. Explain with a suitable diagram a typical growth curve of bacteria. b. Define generation time.	5 (4+1)	CO1
Q23	a. Describe how did three domain kingdom classification came about. b. Who was the scientist who gave three domain classification? c. Write the name of the molecule which is central to 3 domain classification.	5 (3+1+1)	CO1

Q24	Describe what are endospores and when and how are they formed.	5	CO1
Section C (2Qx15M=30 Marks)			
Q25	<p><i>Salmonella</i> causes typhoid. It is due to a multicomponent system that ensures effector molecules are inserted into host membrane in a single step. This multicomponent system of <i>Salmonella</i> also shares components which another machinery that regulates motility.</p> <p>a. Describe which systems are being referred to?</p> <p>b. Name the system which <i>Salmonella</i> has that passes protein effectors in 1 step?</p> <p>c. Illustrate the structure of this system.</p> <p>d. Enlist if there are any such systems which enable passage of DNA?</p> <p>e. Are there such systems which are used by both types of bacteria? Enlist those systems. Elaborate on the types and roles of those multicomponent system (at least one) which are present in both gram-positive and gram-negative bacteria.</p>	15 (1+2+4 +1+7)	CO3
Q26	<p>You modified agar motility test to suit your experiments. There are three tubes below; with motile bacteria and non-motile bacteria. Given this; answer the following questions:</p> <div style="text-align: center;">  </div> <p>a. Amongst the three A, B and C distinguish between motile and non-motile bacteria.</p> <p>b. Reason why are bacteria motile and some non-motile? (name appendage)</p> <p>c. Illustrate the structure of this appendage in bacteria.</p> <p>d. Explain how this appendage is different in eukaryotes.</p> <p>Some bacteria with this appendage give chemotactic responses while others don't. Define chemotaxis. Infer what is the role of this bacteria in chemotaxis with suitable example.</p>	15 (1.5+1.5 +5+7)	CO3
Section D (2Qx10M=20 Marks)			
Q27	Define quorum sensing. Illustrate with example how gram-positive bacteria respond as group and as individuals.	10 (2+8)	CO3
Q28	<p>a. Give an account of antimicrobial resistance mechanisms in bacteria.</p> <p>b. Spot the antibiotic. Enlist its mode of action. Also, write about the mechanism of resistance of this antibiotic.</p> <div style="text-align: center;">  </div>	10 (6+4)	CO2