U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

April 2024 Semester End Main Examinations

Programme: B.E. **Semester: III**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 23BT3PCMBG / 22BT3PCMBG **Max Marks: 100**
Course: Microbiology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Draw a suitable ray diagram of Phase contrast microscopy. Comment on the specimen preparation process before imaging under TEM.	*CO1*	*PO1, 2*	**8**
	b)	Calculate the resolving power of a microscope if its numerical aperture is 0.12 and wavelength of light used is 6000Å.	*CO1*	*PO1,2*	**4**
	c)	Molecular approaches can be useful in categorizing microbes. Justify the statement with suitable examples.	*CO1*	*PO1,2*	**8**
		UNIT - II			
2	a)	Distinguish SPC from DMC. What are the benefits of SPC in microbial research?	*CO2*	*PO2*	**5**
	b)	Differentiate between *Bacillus subtilis* and *E.coli* on the basis of their structure and biochemical reactions.	*CO2*	*PO2*	**10**
	c)	Comment on the basic ingredients required for the growth of *Pseudomonas aeruginosa.*	*CO2*	*PO2*	**5**
		OR			
3	a)	With suitable graph depict a typical growth curve and its relation to generation time. Answer the following questions relate to Growth curve with appropriate reasoning : a) In which phase would you expect to observe the most endospores in a *Bacillus* cell culture? b) During which phase would penicillin, an antibiotic that inhibits cell-wall synthesis, be most effective?	*CO2*	*PO2*	**12**
	b)	Compare and contrast any one direct and one indirect measurement of growth in bacteria based on cell mass.	*CO2*	*PO2*	**8**

			UNIT - III			
	4	a)	A gene can be transferred from one bacterial species to another via phages. Discuss with suitable types an examples.	***CO2***	***PO2***	**8**
		b)	Discuss an alternative pathway to glycolysis that is used to produce ribose-5-phosphate and nicotinamide adenine dinucleotide phosphate and its importance.	***CO3***	***PO2***	**6**
		c)	A scientist discovers a new species of fungus that introduces genetic diversity during reproduction by creating a diploid zygote. To which class the fungus belongs to and what is the process of reproduction involved.	***CO2***	***PO2***	**6**
			OR			
	5	a)	Infer why HFr X F^+ conjugation is efficient when compared to other conjugation techniques. Will the recipient cell gets F^+ plasmid? Comment.	***CO3***	***PO2***	**6**
		b)	With suitable flowchart differentiate between homo & hetero lactic fermentation.	***CO3***	***PO2***	**8**
		c)	Write the steps involved in replication of any one animal viruses.	***CO2***	***PO2***	**6**
			UNIT - IV			
	6	a)	With appropriate justification suggest the methods suitable in complete sterilization of: I. Antibiotic and Metabolite solutions II. Microbial media III. Forceps and Scalpel IV. Glass Test tubes and petriplates	***CO2***	***PO2***	**12**
		b)	Discuss the mode of action of B-lactam class of antibiotics. Comment on MDR with suitable example.	***CO2***	***PO2***	**8**
			UNIT - V			
	7	a)	Write critical notes on: I. Biofertilizers II. Biopesticides	***CO3***	***PO2***	**10**
		b)	The products obtained from food industry involves important biochemical reactions and processes occurring in several microbes. Discuss with examples.	***CO3***	***PO2***	**10**

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