Q. Code:187829

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Third Semester

BT18305 – MICROBIOLOGY

(Biotechnology)

(Regulation 2018/2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Compare the various microscopy and its applications in the field of microbiology	**3**
CO 2	Demonstration of microbes characterization along with microbial structural classification of bacteria, fungi, cyanobacteria, virus and actinomycetes, culturing, reproduction and significance	**3**
CO 3	Identify the various physical and chemical growth requirements of bacteria growth.	**3**
CO 4	Solve the problems in microbial infection and their control	**3**
CO 5	Examine the application of microbiology in fermentation industry, agricultural and environmental fields	**4**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	How can we differentiate between living and dead microbes during microscopic examination?	**1**	**2**
2.	Why is flagellar staining a more challenging procedure compared to Gram staining, and what information does it provide about microbial motility?	**1**	**2**
3.	How does the structural organization of bacteria differ from that of fungi?	**2**	**2**
4.	Compare and contrast yeast asexual and sexual reproduction processes.	**2**	**2**
5.	What factors can cause a culture to enter the stationary phase prematurely?	**3**	**2**
6.	How would you design a medium to differentiate between two closely related bacterial species?	**3**	**2**
7.	Differentiate the effectiveness between physical methods and chemical methods of Sterilization.	**4**	**2**
8.	Why is the emergence of antibiotic resistance a major public health concern?	**4**	**2**
9.	Give an example of how bioremediation can be used to clean up a specific type of pollutant.	**5**	**2**
10.	Mention any two methods of food preservation with mode of action.	**5**	**2**

PART- B (5 x 14 = 70 Marks)

			Marks	CO	RBT LEVEL
11. (a)	**(i)**	Compare and contrast the principles behind differential staining and specific staining techniques.	**(7)**	**1**	**3**
	(ii)	How do these techniques provide information about the morphology and physiology of microorganisms?	**(7)**	**1**	**3**

(OR)

(b)		Discuss the limitations of resolution, magnification, and depth of field in light microscopy and how electron microscopy overcomes these limitations.	**(14)**	**1**	**3**
12. (a)		Discuss the structural features of viruses and how they rely on host cells to multiply.	**(14)**	**2**	**3**
		(OR)			
(b)	**(i)**	Compare and contrast the structural organization and reproduction of different algal groups.	**(7)**	**2**	**3**
	(ii)	Analyze the challenges faced by mycoplasma structure and how they have adapted to survive and replicate within a host.	**(7)**	**2**	**3**
13. (a)	**(i)**	Explain the rationale behind using selective and differential media for bacterial isolation and identification.	**(7)**	**3**	**3**
	(ii)	Compare and contrast aerobic respiration and anaerobic respiration in terms of electron transport chain involvement, substrate utilization, and ATP yield.	**(7)**	**3**	**3**
		(OR)			
(b)		Discuss the advantages and limitations of optical density, colony forming units, and direct microscopic counting for quantifying bacterial growth.	**(14)**	**3**	**3**
14. (a)		Choose any two different classes of antibiotics and discuss their specific modes of action.	**(14)**	**4**	**3**
		(OR)			
(b)		Summarize culture-based methods and newer molecular methods used for microbial identification. Discuss the advantages and limitations of each approach.	**(14)**	**4**	**3**
15. (a)		Evaluate the potential and limitations of using biofertilizers and biopesticides as sustainable alternatives to chemical fertilizers and pesticides.	**(14)**	**5**	**3**
		(OR)			
(b)	**(i)**	Explain the mechanism of bioleaching by microorganisms and evaluate its effectiveness in recovering metals from low-grade ores.	**(7)**	**5**	**3**
	(ii)	Compare and contrast the production processes for vitamin B12 and biogas. Discuss the specific challenges and considerations for each process.	**(7)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

			Marks	CO	RBT LEVEL
16.		Many bacterial species exhibit unique metabolic capabilities. Discuss one example of a specific bacterial metabolic pathway that has industrial or environmental applications. How does this pathway highlight the diverse and adaptable nature of bacterial metabolism?	**(10)**	**3**	**3**

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