

B.E. FOOD TECHNOLOGY AND BIO-CHEMICAL ENGINEERING FIRST YEAR SECOND SEMESTER – 2018

MICROBIOLOGY- I

Time: Three Hours

Full Marks: 100

Use Separate Answer scripts for each part

Different parts of the same question should be answered together

Part-I

Full Marks-50

1. Answer any one from (a) and (b)

a) Why are microorganisms stained? What is meant by : mordant, acid fast bacteria, Explain acid fast staining technique. 2+3+5

b) What is differential staining? Give example. How does composition of cell wall affect Gram staining? State the differences between gm+ve and gm-ve bacteria. 3+3+4

2.a) Define: thermal death time, decimal reduction time, F value

State the appropriate method of sterilization for each of the following: Test tubes, inoculation needle, milk, medium containing vitamin.

State the causes of destruction of microorganisms by dry heat and moist heat. 4.5+2+3.5

b) State the characteristics of ideal antimicrobial chemical agent. How could you evaluate an antimicrobial agent by phenol co efficient method.? 5+5

3. Answer any one from (a)and (b):

a) How do the following chemicals act as disinfectant: phenol and phenolic compounds, alcohols and halogens. 10

b) State the working principle of autoclave.

Comment on: sterilization by membrane filtration, 5+5

4. Answer any one from (a)and (b):

a) What is meant by nitrogen fixation? Differentiate between symbiotic and non-symbiotic nitrogen fixation? Give two examples each of symbiotic and non-symbiotic nitrogen fixation organisms. 2+5+3

b) State the essential reactants of bacterial nitrogen fixation process. What is "nodule"? Explain about formation of nodule. 4.5 +1.5+ 4

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Use Separate Answer Scripts for Part I and Part II

Part II (Marks-50)

1. Answer any **two** from (a), (b) and (c)

Differentiate between:

5+5=10

- a) Selective and Differential Media
- b) Lytic and Lysogenic cycle of virus
- c) Autotroph and Heterotroph

2. Answer any **two** from (a), (b), (c)

20+20=40

a) Explain the Gram characteristic of bacteria with respect to its cell wall structure. Describe how bacteria are classified on the basis of its temperature and gaseous requirement. Name and describe the structure of the organelle responsible for the motility of bacteria. $6+(5+5)+(1+3)=20$

b) What are hyphae? Describe the structure of hyphae. Differentiate between pour plate and spread plate technique. Describe processes of preservation and maintenance of microbial cultures. $(1+4)+5+10=20$

c) Describe any one method of quantitative estimation of bacterial growth. Draw and explain the various phases of a bacterial growth curve. Differentiate between simple and complex media. Describe any one method of isolating a pure culture. $5+5+5+5=20$