Total No. of printed pages = 4

63/2 (SEM-1) BIT 102

2021

(held in 2022)

BIOTECHNOLOGY

(Theory Paper)

Paper Code : BIT-102

(Microbiology)

Full Marks – 80

Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Define the following : 1×6=6

(a) Holiday Junction

(b) Pure culture

(c) Inoculum

(d) Microbial growth

(e) Fed-batch culture

(f) Synchronous growth.

[Turn over

2. Give very short answers to the following questions : 2×5=10

(a) What is Biogas ?

(b) Name four nutritional groups of microorganisms.

(c) What are the beneficial effects of microbes on the earth's environment ?

(d) Differentiate between batch and continuous culture.

(e) What is differential staining ? Give examples.

3. Answer any *six* of the following questions : 5×6=30

(a) Write on the mechanism of action of endotoxin and botulinum toxin.

(b) Describe the mode of action of Rifampicin, Fluoroquinolones, Penicillin and Sulfonamides.

(c) What is a phylogenetic tree ? Draw the four types of phylogenetic tree depicting the relation between Bacteria, Archaea and Eukarya. 1+4=5

(d) Describe in brief the modern criterions used for classification of microorganisms.

(e) Discuss the characteristics of the three domains (bacteria, archaea and eukarya) with suitable examples.

(f) Briefly describe the different types of culture media used for culturing microorganisms.

(g) Describe the Ames Test for mutagenesis with neat and labelled diagram.

(h) Explain in brief the process involved in the making of Yogurt.

(i) What is ruminant symbiosis ? Explain with suitable diagram.

4. Answer any *two* of the following questions : 10×2=20

(a) What is vaccines ? Describe the different types of vaccines available at present. 2+8=10

(b) Describe the stages of microbial growth with a neat and labelled diagram. 8+2=10

(c) Define conjugation. Explain with suitable diagrams the conjugation between 2+4+4=10

(i) F^+ and F^-

(ii) Hfr and F^-

5. Answer any *one* of the following questions : 14×1=14

(a) What is symbiotic nitrogen fixation ? Explain with suitable diagrams the process of formation of root nodules in leguminous plants for symbiotic nitrogen fixation. 2+12=14

(b) What is the difference between TGGE and DGGE ? Explain the two techniques with suitable diagrams. 2+6+6=14