53 (FPT 301) BMCB

2018

BASIC MICROBIOLOGY

Paper : FPT 301

Full Marks : 100

Time : Three hours

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

*Answer **any five** questions.*

1. *(a)* Discuss briefly the importance and scope of microbiology in the areas of food, medicine, environment and biotechnology. 8

   (b) Describe with a simple schematic diagram, how Pasteur's "Goose-neck" experiment conclusively proved the "germ theory". 8

   (c) State the Koch's postulates. Who established the double-helix structure of DNA ? 3+1=4

2. *(a)* Classify bacteria on the basis of —

(i) Oxygen requirement

(ii) Optimum growth temperature

Give example for each classification. 4+4=8

(b) Briefly describe the *four* major phyla of fungi with examples. 12

3. *(a)* Use a simple schematic diagram to explain how magnification is achieved in a Compound Light Microscope. 5

(b) What is the principle of action in Phase-contrast microscope ? What is the major difference between images obtained by Transmission Electron Microscope (TEM) and Scanning Electron Microscope (SEM). 4+1=5

(c) Explain with a simple schematic diagram, how a simple batch retort is operated for heat sterilization of a food. 5

(d) What are the major differences in structures of Gram positive and Gram negative cell walls ? What are the *two* types of motility shown by a single bacterial cell ? 4+1=5

4. *(a)* Briefly describe the structure of an endospore using a simple schematic diagram. 10

(b) Briefly describe structure of ribosome (use a schematic diagram). Explain how it takes part in translation and protein synthesis. 4+3=7

(c) What are "vacuoles" in a bacterial cell ? What are their major functions ? 2+1=3

5. *(a)* Briefly describe the structure of a bacteriophage using an appropriately labeled schematic diagram. 10

(b) Describe the "lytic cycle" bacteriophage replication using a simple schematic flow diagram. 10

6. *(a)* Describe primary and secondary active transport system for nutrition uptake by bacterial cell. 8

(b) Explain the *four* major phases of microbial growth using a simple example of growth curve. 8

(c) Discuss *any one* of the four primary groups of antibiotics with appropriate examples. 4
