Total No. of printed pages = 3

19/3rd Sem/UFET304

2021

BASIC MICROBIOLOGY

Full Marks – 100

Time – Three hours

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

Answer any *five* questions.

1. (a) Explain the modes of action of the antibiotics penicillin and rifampin. 6×2=12

   (b) Who first discovered bacterial cells under microscope ? And how did he describe them ? 2+2=4

   (c) What is the domain of cyanobacteria ? Give a brief introduction to this group of micro-organisms. 1+3=4

2. (a) What is full form of PCR analysis related to microbial genetics ? Who invented this technique ? And what is its significance ? 1+1+2=4

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(b) Elaborate on secondary active transport and group translocation mechanisms of nutrition uptake by a bacterial cell. Use appropriately labelled schematic diagrams to enrich your elaborations. 2×8=16

3. (a) Describe the structure of ribosome and explain with schematic diagram, transcription and translation processes. 12

(b) List four major differences between Gram positive and Gram negative cell wall structures. 4

(c) What are plasmids, and what are their functions ? What are FtsZ proteins, and what is their importance in a bacterial cell ? 2+2=4

4. (a) Write short notes on any *two* of :

(i) Pilli, (ii) Spore coat, (iii) Prophage genome. 2.5×2=5

(b) Describe the structure of a bacteriophage using an appropriately labelled schematic diagram. Elaborate on lytic cycle of bacteriophage lifecycle. 5+8=13

(c) What is a facultative anaerobic bacteria ? Give an example. 2

5. (a) List Koch's postulates. Describe how Louis Pasteur's swan's neck experiment conclusively proved germ theory. 3+8=11

(b) Using a schematic diagram, explain how compound light microscope magnifies an object. 5

(c) What is methanogenesis ? What are the ecological locations, where it is carried out by naturally present bacteria ? Give an example of methanogenic bacteria. 1+2+1=4

6. (a) In micro-ecosystems, what are the primary producers, consumers and decomposers ? Give examples. 5

(b) What is the major structural difference between healthy and infective prions ? Describe the life-cycle of the Plasmodium parasite responsible for malaria in humans using a schematic flow-diagram. 1+9=10

(c) List two harmful and two beneficial effects of microorganisms on food. Give an example for each. Explain why there is very low free water content in spore core. 4+1=5