2016

BOTANY

(Major)

Paper : 5.1

(Microbiology and Immunology)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following as directed : 1×7=7

(a) Robert Koch postulated the Germ Theory of Disease based on his studies on the _____ disease of animals.
(Fill in the blank)

(b) What are psychrophilic micro-organisms?

(c) Name the group of Archaeobacteria which produces methane anaerobically.

(d) What is BOD?

(e) Name the enzyme found in the root nodule of leguminous plants.

(f) _____ is the major circulating antibody in animals.

(Fill in the blank)

(g) The infectious protein which causes the neurological disease called 'scrapie' in sheep is termed as _____.

(Fill in the blank)

2. Write briefly on any *four* of the following : 2×4=8

(a) Rickettsiae

(b) Fermentation

(c) Antigen

(d) Virusoids

(e) Aerobiology

3. Answer any *three* of the following questions : 5×3=15

(a) "Bacterial growth is said to be synonymous to reproduction." Explain.

(b) Write a note on the scope of microbiology.

(c) Why are viruses said to be an intermediate stage between living and non-living? Explain.

(d) In the microbiological context, discuss briefly about the different types of water pollution.

(e) What is the role played by microbes in Bioremediation and Bioleaching? Give suitable examples in each case.

(f) Write a note on the different groups of microbes, classified on the basis of the method of ATP generation.

4. Answer the following questions :

(a) "Microorganisms form various physical associations with different organisms, including other microbes." Write a note on such associations, giving suitable examples. 10

Or

"Griffith's transforming principle was DNA." Which type of bacterial reproduction does this sentence refer to? Explain. How does the cell wall of Gram +ve bacteria differ from that of Gram –ve bacteria? 6+4=10

(b) What is a biogeochemical cycle? Give a detailed account of cycling of elemental sulphur in nature. Mention the microorganisms involved in each step. 1+9=10

Or

What are 'nod' and 'nif' genes? Explain the process of formation of root nodules and the biochemistry of nitrogen fixation in these nodules. 2+8=10

(c) What is cellular immunity? Explain the role of T-lymphocytes in cellular immunity. 2+8=10

Or

Define 'specific resistance'. Explain in detail how antibodies interact with antigens to develop specific resistance. 2+8=10

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