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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 : $1 \times 7 = 7$

(a) Which of the following is the most abundant immunoglobulin (Ig) in human?

(i) IgM

(ii) IgG

(iii) IgA

(iv) IgE

(Choose the correct answer)

(b) The root nodules of legumes contain a unique protein pigment which has high affinity for oxygen is called

- (i) nod haemoglobin
- (ii) leghaemoglobin
- (iii) haemoglobin
- (iv) None of the above

(Choose the correct answer)

(c) 'Rocky mountain spotted fever' is caused by _____.

(Fill in the blank)

(d) Which microorganism could be found living in a hot spring?

- (i) Mesophile
- (ii) Psychrophile
- (iii) Thermophile
- (iv) Halophile

(Choose the correct answer)

(e) Name one virus that multiplies only in plants.

(f) *Mycobacterium tuberculosis* as causative agent of tuberculosis was discovered by _____.

(Name the scientist)

(g) The three phylogenetically distinct lineage groups of cells called domains diverged from a common 'universal ancestors' are grouped on the basis of possessing which of the following sequences?

(i) rRNA sequence

(ii) cyt-c sequence

(iii) Morphology and rRNA sequence

(iv) Amino acid sequence

(Choose the correct answer)

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

(a) Prions and diseases caused by prions

(b) Pleomorphism in mycoplasmas

(c) Coulter counter and its use

(d) Innate immunity

(e) Contribution of Louis Pasteur in microbiology

(f) What is sampling of air-borne micro-organism? Mention two types of samplings used for study of such micro-organism.

3. Answer any *three* of the following : $5 \times 3 = 15$

(a) To test the pathogenesis of causative agents of diseases Robert Koch laid down postulates known as Koch's postulates. Mention the steps of Koch's postulates.

(b) Explain the distinguishing characters of Actinomycetes.

(c) Describe various steps in decomposition of cellulose and also mention the microorganisms involved in cellulose decomposition.

(d) Mention on the basis of interaction of bacteriophage with host bacterium the lytic and lysogenic phages.

(e) Briefly describe the antibody-mediated immunity (Humoral Immunity).

4. Answer the following questions : 10×3=30

(a) Mention the history and future prospects of microbiology in various fields.

Or

Write in detail the different phases of growth curve in bacterial growth. Give diagram.

(b) On the basis of metabolic and ecological characteristics, mention different groups of Archaeobacteria giving examples.

Or

Give a general account of Chlamydiae and mention the diseases caused by Chlamydiae.

(c) Mention the morphology, replication and transmission of viroids in brief giving examples.

(7)

Or

Describe the structure and functions of different types of antibodies. Also mention the mechanism of antibody formation.

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