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(July)

BIO-CHEMISTRY

(Honours)

(Microbiology and Immunology)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks
for the questions

Answer **four** questions, taking **two** from each Part

PART—A

(Microbiology)

1. *(a)* Define balanced and unbalanced growth in bacteria. 4

   (b) Compare and contrast the viable but non-culturable (VBNC) status of microbes with that of cell death as a mean of responding to nutrient starvation in a batch culture. 6

   (c) Mention the factors that influence the lag phase of growth. 4

2. *(a)* Discuss the differences between bacteria and archaea in relation to the chemical composition of their plasma membrane. 5

   (b) What are the distinguishing features between Gram-positive and Gram-negative bacteria? 5

   (c) Classify prokaryotes according to the way in which they obtain carbon and energy. 4

3. Write notes on any *two* of the following :
   $7 \times 2 = 14$

   (a) Role of microbes in food spoilage

   (b) Bacterial conjugation

   (c) Transduction

   (d) Selective and differential media

PART—B

(Immunology)

4. *(a)* What are innate and adaptive immunity? Explain. 7

   (b) Briefly discuss various cells of the immune system. 7

5. *(a)* Explain with the help of diagram(s) the structure of an immunoglobulin.   8

     (b) How does antigen-antibody interaction take place during specific immunity?   6

6. *(a)* What are haematopoietic stem cells? Describe the origin and role of myeloid and lymphoid progenitor cells.   1+6=7

     (b) What is autoimmunity? Briefly describe any *one* of the following :   2+5=7

       (i) Myasthenia gravis

       (ii) Rheumatoid arthritis

       (iii) Graves' disease

7. *(a)* What are major histocompatibility complex (MHC) molecules? Briefly discuss the structure and functions of MHC molecules.   2+6=8

     (b) Briefly discuss the IgE mediated hypersensitivity.   6

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