2021
MICROBIOLOGY
[HONOURS]
Paper : VIII

Full Marks : 80   Time : 4 Hours

The figures in the right-hand margin indicate marks.
Candidates are required to give their answers in
their own words as far as practicable.
Write the answers to questions of each Group
in separate books.
Answer all the questions.

GROUP–A

(Epidemiology & Medical Microbiology)

(Marks : 40)

1. Answer any **two** from the following :   1×2=2

    a) What do you mean by LD_{50} of a drug?

    b) What is the unique enzyme present in the complete virion of HIV?

    c) What is mucus?

    d) What is Zoonosis?

2. Answer any **two** from the following: 2×2=4

    a) What are the common sign & symptoms of Dermatomycosis?

    b) What is Septicemia?

    c) What is opportunistic pathogen? Give an example.

    d) What is tubercle?

3. Answer any **four** from the following: 6×4=24

    a) Distinguish between narrow spectrum & broad spectrum drugs with suitable example. How can you determine Minimum Inhibitory Concentration (MIC) and Minimum Lethal Concentration (MLC) of an antibiotic.

                                            3+3

    b) Briefly describe the course of influenza infection. How does the virus cause the symptoms associated with flu? Why has it been difficult to develop a single flu vaccine?

                                            2+2+2

    c) What is the difference between pandemic and endemic diseases? What is herd immunity? What is pathogenicity island?   2+2+2

d) Discuss the sign, symptoms and associated diseases of AIDS. How do the receptor proteins play important role in the infection process of HIV? 3+3

e) Which microorganisms are responsible for dental caries? How do they cause tooth decay? How do these microbes survive in presence of salivary lysozyme? 2+2+2

f) Distinguish between endotoxin and exotoxin. Give example of a neurotoxin and describe its mechanism of action. 3+3

4. Answer any **one** from the following: 10×1=10

a) Describe the major symptoms, causative agent, pathogenicity, epidemiology and management of the disease plague.
2+1+3+2+2

b) Write short notes on :

i) Prophylactic agents

ii) Nalidixic acid

iii) Drug resistance in tuberculosis.
3+3+4

GROUP–B

(Immunology & Immunodiagnostics)

(Marks : 40)

5. Answer any **two** from the following: 1×2=2

i) What is superantigen?

ii) What is anaphylaxis?

iii) Which immunoglobulin isotype acts as transmembrane antigen receptor on B cell?

iv) How are toxin generally attenuated?

6. Answer any **two** from the following: 2×2=4

i) What is dendritic cell? What are their functions in immune response?

ii) State the principles of agglutination and double diffusion.

iii) Express precipitation assay principle.

iv) What is TCR? How does it differ from BCR?

7. Answer any **four** from the following: 6×4=24

i) Give an outline of ELISA for the detection of HIV in a blood sample.

ii) What are the biologic effects of IL–2?

iii) How does B lymphocyte present antigen to T helper cell?

iv) Discuss the role of IgE in the effector phase of humoral immunity.

v) Distinguish between monoclonal and polyclonal antibody. Describe the hybridoma technology for the production of monoclonal antibody mentioning the significance of HAT medium.

vi) State briefly how do TH and TC cells differ in their function.

8. Answer any **one** from the following: 10×1=10

i) Write short notes on : $2\frac{1}{2} \times 4 = 10$

   a) Radioimmunoassay

   b) Graft rejection

   c) Antibody

   d) Lymph node

ii) a) How do the mononuclear phagocytes present exogenous and endogenous antigens to the respective T cells?

   b) How do complements play important roles in adaptive immunity?   7+3=10

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