2021

MICROBIOLOGY — HONOURS

Paper : CC-5

Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Question no.* 1** is compulsory and answer ***any three questions from the rest.

1. Answer ***any ten*** questions : 2×10

(a) In certain food processing, bacteriophages are applied. What should be its nature, lytic or lysogenic? Why is it done?

(b) Define capsomere with example.

(c) Give an example of virus having (i) Cytoplasmic Assembly (ii) Nuclear Assembly.

(d) Give examples of two virus-mediated human cancers and their causal viral elements.

(e) Name the unusual bases present in T4 genome.

(f) What do you mean by multiplicity of infection?

(g) State two characteristic features of Picornavirus.

(h) How would you determine whether the virus is ds/ss DNA or RNA virus?

(i) What do you mean by the term cytopathic effect?

(j) State the mode of action of Adamantanamine.

(k) Write down the limitations of gene therapy.

(l) How virusoids are different from satellite virus?

(m) 'Genome of most DNA viruses replicate in the nucleus wheras genome of most RNA viruses replicate in the cytoplasm'— Explain.

(n) Why do phage plaques do not enlarge indefinitely?

(o) What is the function of prions? Give example.

2. (a) Cro and cI protein concentrations are essential for maintaining / switching lytic and lysogenic process in λ. — Justify.

(b) What strategies have to be taken by the T7 phage at the time of entry of their genome into host cell?

(c) What are the differences between λ lysogen and λ resistant?

(d) What do you mean by λ induction? 4+2+2+2

3. (a) How many genes code for RNA polymerase of influenza virus?

(b) Schematically explain the reverse transcription strategies of HIV for the production of their viral genome.

(c) How does hepadnaviral reverse transcription strategy differ from that of retroviral reverse transcription process?

(d) What do you mean by overlapping genes? How many overlapping genes are there in ϕX174? 1+4+3+2

4. (a) Give an example of two oncogenic virus.

(b) What are oncogene and protooncogene?

(c) Discuss the mode of action of acyclovir or ganciclovir.

(d) What do you mean by the term HAART?

(e) State the function of T-antigen and t-antigen for SV 40. 2+2+2+2+2

5. (a) Describe briefly the mode of action of NRTIS and NNRTIS with respective examples.

(b) 'Interaction of virus with cellular receptors is host specific'— Justify the comment with two suitable examples.

(c) What are the two types of gene therapy? What kind of viruses are used for this? (1½+1½)+(2+2)+(2+1)

6. (a) What would happen if bacteriophage is added to an *E.Coli* culture lacking outer membrane protein, responsible for maltose uptake?

(b) What is the importance of capping in viral genome? Give name of a virus which shows capping in its genome.

(c) Mention about the nature of the genome of Class II and Class III viruses of Baltimore Scheme.

(d) How virulent phages are different from temperate phages?

(e) What is phage titre? 2+2+2+2+2

7. Write short notes on (***any four***) : 2½×4

(a) Icosahedral symmetry of viruses

(b) M13 phage vector

(c) Host range and specificity of viruses

(d) Plaque count assay

(e) Phage typing

(f) Retroviruses.
