

2022

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) Define proto-oncogene with example.
 - (b) Give example of a viral vector and mention its application.
 - (c) What is superinfection immunity?
 - (d) Why enveloped viruses are often called 'ether sensitive'?
 - (e) What is mad cow disease? Mention the causative agent of this disease.
 - (f) State two characteristic features of influenza virus.
 - (g) What are the surface antigen present in SARs-CoV?
 - (h) Why oral polio vaccine requires multiple boosting?
 - (i) Give an example of virus having (i) Terminal redundancy (ii) Direct repeat in their genome.
 - (j) What are the uses of maltose and Mg^{2+} at the time of *E.coli* growth during phage λ assay?
 - (k) Name the phage family which can attack cyanobacteria also. State the nature of its genome.
 - (l) Name the unusual base of TMV and state how it is important for the virus.
 - (m) Why are satellite viruses not considered as true virus?
 - (n) How does a phage become clinically significant?
 - (o) Why triple therapy is being applied against HIV?
2. (a) Schematically represent how an oncovirus can influence the oncogenesis of a cell. Support your answer with suitable example. 4+4+2
- (b) How virus affected mammalian cells can be distinguishable from the rests from the view points of morphology and biochemistry?
- (c) Name two drugs effective on oncovirus. 4+4+2

Please Turn Over

3. (a) State the basis of Baltimore classification of virus. Apart from this are there any more criteria can be considered for this purpose? Define Class V viruses with example.
(b) Describe briefly the mechanism of an antiviral drug acting as nucleoside analogue.
(c) How do interferons get induced during viral infection?
(d) How does a virus maintain host specificity? (1+1+2)+2+2+2
4. (a) Where from the viral envelope develops? State its functions.
(b) Describe the significance of cap and tail of TMV.
(c) What are the techniques to study viral morphology? Describe briefly any of these stating its advantages. (1+1)+3+2+3
5. (a) Describe helical capsid symmetry of viruses using a suitable example.
(b) What is ICTV? State their role in viral classification.
(c) Schematically represent the infection cycle for prion mediated diseases.
(d) Give a brief description about the importance of spike proteins in viruses. 3+(1+2)+2+2
6. (a) Write down the function of the following proteins in λ phage
(i) cI
(ii) Integrase
(iii) N
(iv) Cro.
(b) Which receptor of *E.coli* is used by T_4 for attachment to the host cell?
(c) Why would T_4 replace all its normal cytosine with an unusual base? (1½×4)+1+3
7. Write short notes on (*any four*) : 2½×4
(a) One step growth curve
(b) Multiplication of viroids
(c) Overlapping genes in virus
(d) Phage display
(e) Neuraminidase inhibitors and their actions
(f) Antigenic shift and drift.
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