WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 4th Semester Examination, 2022

MCBACOR09T-MICROBIOLOGY (CC9)

VIROLOGY

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

Question No. 1 is compulsory and answer any *four* questions from the rest

1. Answer any ***four*** questions from the following: 2×4 = 8

   (a) 'Helical arrangement of the capsomeres are evolutionarily favourable than the cylindrical arrangement, if stability is concerned' – Explain whether this statement is True or 'False', Considering TMV as a model.

   (b) Define Capsid and Peplomer.

   (c) What is segmented genome? Give example.

   (d) What is oncogene? Why do oncogenic viruses cause cancer only to their non-permissive host?

   (e) How can you distinguish between a temperate phage and a true lysogenic phage under laboratory condition?

   (f) How does T4 bacteriophage gets its energy to inject its genome into the host?

   (g) Comment on the genetic material of the virus SV40. What is burst size?

   (h) Why booster dose is required after getting second dose of COVID-19 vaccine?

2. (a) How can you classify viruses? Represent the Baltimore classification scheme with example of polio virus. 2+3

   (b) Suppose you want to isolate bacteriophage against *Vibrio cholerae* from sewage water. What would be the experimental procedure? 3

3. (a) How CII-CIII association helps in lysogenization of lambda phage into the *E.coli* chromosome? 3

   (b) What is the role of CRO in the life cycle of lambda phage? 3

   (c) In S mutant of lambda phage, what would be the physical abnormalities? 2

4. (a) You are provided with two *E.coli* culture E1 and E2. Culture E1 was treated with UV rays for 5 mins. and then infected with λ phage whereas culture E2 was first infected with λ phage and then treated with same dose of UV rays. After these treatments both *E.coli.* cultures E1 and E2 were incubated overnight at 37°C incubator. 2+2

   What results will you get after overnight incubation – Explain.

   (b) "Wild type mice can never get infected by Polio virus" – Justify the statement. 2

   (c) What do you mean by IRES? 2

5. (a) How does AZT and Acyclovir differs in their mode of action? 2+2

   (b) What will happen if Picorna virus infect a protease mutant host cell? 2

   (c) How can you differentiate between the mRNA and anti-genome RNA of Influenza virus. 2

6. (a) What is vaccine? How viral vaccines can be developed? 2+2

   (b) How does Prion proteins multiply within the host cell even in presence of proteases in the host cell. 2

   (c) Why T4 phages cannot produce functional progeny of the host *E.coli* is incubated at a non-permissive temperature? 2

7. (a) What are the genomic properties of adenovirus? 2

   (b) What are the mechanisms of action of amantadine? Where these drugs are used? 3

   (c) Which viral vector is most suitable for gene therapy? Comment. 3

8. (a) What is the significance of eclipse phase in one step growth curve of viruses. 2

   (b) The envelop of enveloped viruses is of host origin – Explain. 2

   (c) How can you establish protein-protein interaction using phage display? Name one virus that is being widely used in this strategy. 3+1

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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