



BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – M.Sc.(MB)-2022
Course Name – Virology
Course Code - MMBC203
(Semester II)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. *Choose the correct alternative from the following :*

- (i) The pregenome RNA serves as template for the viral reverse transcriptase and for production of the DNA genome. Infer the type of virus that exhibit this
- a) Positive sense single stranded RNA through a DNA intermediate b) Double stranded DNA virus that replicate through a single stranded RNA
- c) Negative sense single stranded RNA d) Single stranded DNA virus
- (ii) Bacteriophages that can enter into stable, long-term relationships with their hosts are called _____.
- a) Lytic phages b) Temperate phages
- c) virulent phages d) lazy phages
- (iii) During the assembly of virus components, explain what happens to the fragments of donor DNA in generalized transduction?
- a) They are destroyed by viral enzymes b) They fuse with host cell DNA
- c) They get incorporated into the virus capsid d) They form their own viruses
- (iv) Identify the ability of a virus to infect an organism is regulated by
- a) the host species b) the type of cells
- c) the availability of an attachment site d) All of the above
- (v) The lysogenic state is governed by the activity of the regulatory region of the lambda phage genomes; explain what this region is termed as
- a) immunity repressor b) immunity operon
- c) operon repressor d) none of these
- (vi) Identify which of the following causes the formation of chorioallantoic membrane lesions
- a) Herpes B virus b) Vaccinia virus
- c) Herpes simplex virus d) All of these

- (vii) Distinguish the chief difference that appears in the viral growth curve compared to a bacterial growth curve?
- a) virions are released from lysed host cells at the same time b) virus infection occurs in bacteria, not in other organisms
 c) bursts lead to a steep rise in bacterial titer d) viruses bind and penetrate the cells without causing infections
- (viii) Judge the role of early proteins in the regulation of viral gene expression?
- a) Bind to viral origin of replication b) Required for initiation of replication and elongation
 c) Activate pathways that induce host-cell entry into S phase d) Activate late gene transcription and may downregulate their own transcription
- (ix) Clathrin coated vesicles are known to be used for viral entry into the host cell. Estimate the percentage of viruses that enter the clathrin-dependent pathway usually associate with pre-existing clathrin-coated domains in the membrane?
- a) 0.25 b) 0.1
 c) 0.05 d) 0.5
- (x) When an influenza virus enters a host epithelial cell, identify where the replication of RNA virus will most likely take place in
- a) Nucleus b) Cytoplasm
 c) Mitochondria d) Centriole
- (xi) Recall the basis for Baltimore classification of viruses
- a) Diseases caused by them b) Structure
 c) Replication mechanism d) Physico-chemical properties
- (xii) Identify the phase in the viral life cycle when it obtains an envelope
- a) attachment b) penetration
 c) assembly d) release
- (xiii) A 23 year old man had recurrent genital herpes that was effectively treated each time with acyclovir. The patient asked his doctor why the treatment was not able to cure recurrence. Predict from the following the most probable answer given by the physician
- a) Acyclovir has a very short duration of action b) Recurrence due to new contact with infected patients
 c) Antiviral drugs have no effect on latent state of viral disease d) Recurrence is due to hypersensitivity reaction to viral proteins.
- (xiv) Determine which structure does the tail of the bacteriophage possess at its end that recognises the hosts?
- a) Connection knob b) Thin tail fibre
 c) Stacked discs d) Tail sheath
- (xv) Interpret what induces internalization by endocytosis in simian virus 40 (SV40)?
- a) Clathrin coating b) Dynamin recruitment
 c) Local actin polymerization d) Macropinocytosis

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Determine a typical viral structure (3)
3. Name three animal and three plant viruses and the diseases they cause (3)
4. Describe the disease were a morse code dot and dash structure is seen on the leaf blade (3)
5. Evaluate the H and N of influenza virus (3)
6. Evaluate in brief the working principle of a vaccine (3)

OR

Evaluate the mode of action of Zidovudine

(3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Describe with suitable diagram the structure of a bacteriophage (5)
8. Examine the lambda phage repressor gene system and the role of the genes involved. (5)
9. Illustrate the viral plaque assay and outline its utility in virus detection (5)
10. Illustrate the structure of a T4 bacteriophage (5)
11. Explain the different types of interferons (5)
12. Outcome of tumor virus infection depends on the virus and the host cell. Some viruses go through their entire replicative cycle with production of progeny, others have limited expression of proviral genes. Justify the role of proviral 'early genes' with respect to SV40 tumour inducing virus. (5)

OR

Reovirus is a non-enveloped virus which causes gastrointestinal disorders. Evaluate the mode of establishment of Reovirus in the host cell. (5)
