



BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – M.Sc.(MB)-2025

Course Name – Virology

Course Code - MMB20406A

(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) Identify the contribution of virology to medicine.
 - a) Vaccine development
 - b) Herbal therapy
 - c) Nutritional science
 - d) Environmental ecology
- (ii) Identify the basis of Baltimore classification.
 - a) Genome type and replication strategy
 - b) Capsid shape
 - c) Host range
 - d) Disease severity
- (iii) Recognize capsid symmetry in viruses.
 - a) Helical and icosahedral
 - b) Random and linear
 - c) Spherical only
 - d) Irregular only
- (iv) Analyze the significance of viral morphology.
 - a) Determines attachment and entry
 - b) Controls host immunity
 - c) Alters genome sequence
 - d) Prevents mutation
- (v) Explain reverse transcription in hepadnaviruses.
 - a) RNA intermediate mediated DNA synthesis
 - b) Direct DNA replication
 - c) RNA genome integration
 - d) Protein-only synthesis
- (vi) Explain regulation of viral gene expression.
 - a) Temporal control of early and late genes
 - b) Random gene expression
 - c) Host chromosome regulation only
 - d) Antibody-mediated control
- (vii) Analyze strategies of viruses to hijack host translation.
 - a) Cap-snatching and IRES usage
 - b) Random ribosome destruction
 - c) Nuclear membrane breakdown
 - d) Host DNA integration only
- (viii) Explain internal ribosome entry site function.
 - a) Cap-independent translation initiation
 - b) Genome replication
 - c) Nuclear import
 - d) Capsid disassembly
- (ix) Apply adaptive immune response to viruses.

- a) Antibody and T cell mediated clearance
- b) Physical barriers only
- c) Interferon production
- d) Random phagocytosis
- (x) Apply immune memory in viral infections.
 - a) Protection upon re-exposure
 - b) Viral latency induction
 - c) Genome mutation
 - d) Immune suppression
- (xi) Evaluate host factors influencing viral pathogenesis.
 - a) Immune status and genetics
 - b) Capsid shape only
 - c) Genome length
 - d) Viral taxonomy
- (xii) Evaluate consequences of immune suppression on viral disease.
 - a) Increased severity and persistence
 - b) Rapid viral clearance
 - c) Reduced infection
 - d) Vaccine efficacy
- (xiii) Distinguish acute and latent viral infections.
 - a) Symptomatic versus dormant states
 - b) Genome size differences
 - c) Capsid symmetry
 - d) Viral taxonomy
- (xiv) Evaluate laboratory preparedness for emerging viruses.
 - a) Infrastructure and biosafety compliance
 - b) Genome mutation rate only
 - c) Viral structure
 - d) Capsid symmetry
- (xv) Apply principles of live attenuated vaccines in immunization.
 - a) Induce strong cellular immunity
 - b) Cannot replicate in host
 - c) Used only for bacteria
 - d) Contain no antigens

Group-B

(Short Answer Type Questions)

3 x 5=15

- 2. Summarize the role of ICTV classification. (3)
- 3. Describe reverse transcription in retroviruses. (3)
- 4. Analyze transcription strategies of DNA viruses. (3)
- 5. Illustrate mechanisms of viral latency. (3)
- 6. Propose approaches to manage antiviral resistance. (3)

OR

- Develop viral applications in nanotechnology. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

- 7. Analyze the structural organization of viruses with respect to capsid symmetry. (5)
- 8. Describe the one-step growth curve and its components. (5)
- 9. Analyze post-translational modification of viral proteins. (5)
- 10. Apply concepts of zoonotic transmission in emerging diseases. (5)
- 11. Analyze biosafety level requirements in virology labs. (5)
- 12. Propose approaches for bioterrorism preparedness. (5)

OR

- Develop integrated responses to emerging viral threats. (5)

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