Roll No. .....

Question Booklet Number

O. M. R. Serial No.

M. Sc. (Microbiology) (Second Semester) EXAMINATION, 2025-26

(New Syllabus Effective from 2023)

VIROLOGY

Paper Code								
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Questions Booklet Series
B

Time : 1:30 Hours] [*Maximum Marks : 75*

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.

2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.

3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।

2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।

3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page) **(शेष निर्देश अन्तिम पृष्ठ पर)**

1. The Tobacco mosaic virus was crystallized for first time by :
   (A) W. M. Stanley
   (B) Louis Pasteur
   (C) Edward Jenner
   (D) Andre Lwoff

2. POCK assay is usually performed in :
   (A) Tissue Culture
   (B) Experimental Animal Models
   (C) Chick ChorioAllantoic Membrane
   (D) Bacterial lawn

3. Which of the following class consists of ds RNA viruses ?
   (A) Class V
   (B) Class VII
   (C) Class III
   (D) Class IV

4. Negative sense RNA strand is also known as :
   (A) Sense RNA
   (B) Antisense RNA
   (C) cDNA
   (D) ribozyme

5. Viruses that infect Cyanobacteria such as LLP and N1 are known as :
   (A) Mycophages
   (B) Cyanophages
   (C) Both (A) and (B)
   (D) None of the above

6. In One Step Growth Curve, the number of virions per bacterium released is described as :
   (A) Latent Period
   (B) Incubation Size
   (C) Burst Size
   (D) All of the above

7. Which of the following is an example of Oncovirus ?
   (A) Epstein Barr Virus
   (B) Hepatitis B Virus
   (C) Human Papilloma Virus
   (D) All of the above

8. Virus typically used for phage display techniques include :
   (A) Lambda phage
   (B) T phage
   (C) M13 phage
   (D) All of the above

9. Which method is commonly used for the confirmation of HIV results from ELISA ?
   (A) Polymerase chain reaction (PCR)
   (B) Immunofluorescence assay (IFA)
   (C) ChorioAllantoic Membrane
   (D) Western blotting

10. What is a common experimental animal used for virus cultivation ?

(A) Guinea Pigs

(B) Mice

(C) Rats

(D) All of the above

11. Example of Group VII pararetroviruspatial ds DNA virus is :

(A) Hepatitis B Virus

(B) Japanese Encephalitis Virus

(C) Small Pox Virus

(D) Rabies Virus

12. In a plaque assay, pfu stands for :

(A) Phase forming unit

(B) Phage forming unit

(C) Plaque forming unit

(D) Paper forming unit

13. Which of the following is an example of a virus ?

(A) Paramecium

(B) Bacillus

(C) Prion

(D) TMV

14. What is Phage typing ?

(A) Using phage host specificity for typing of bacteria

(B) Facilitating attachment to host cells

(C) Viral genetic material assay

(D) None of the above

15. What function does DNA dependant RNA polymerase perform ?

(A) Transcription

(B) Translation

(C) Replication

(D) Reverse transcription

16. Which virus is associated with causing diarrhoea in children ?

(A) Adenovirus

(B) Herpesvirus

(C) Hepatitis virus

(D) Rotavirus

17. Which of the following is not a method for viral nucleic acid study ?

(A) PCR

(B) Southern blot

(C) Gel electrophoresis

(D) ELISA

18. In viral genomics, an ORF refers to :

(A) Open Reading Frame

(B) Open Reading Form

(C) Open Reverse Frame

(D) Open Reverse Frame

19. Which virus causes mosaic symptoms on leaves ?

(A) Herpes simplex virus

(B) Pox virus

(C) TMV

(D) Measles virus

20. Which of the following causes synergistic pathogenecity ?

(A) PVX and TMV

(B) PVY and TMV

(C) PSTVd

(D) PVX and PVY

21. Which of the following is method for virus particle quantification ?

(A) Ultracentrifugation

(B) Affinity Chromatography

(C) Ultrafiltration

(D) Electron Microscopy

22. What is the primary target of HAART therapy ?

(A) HIV

(B) PVY

(C) TMV

(D) SV40

23. How can viral cytopatheic effect vary ?

(A) It remains constant across all viruses regardless of host cells.

(B) It varies only based on environmental factors.

(C) It can change depending on the virus and host cell type infected.

(D) It is universal for all viral infections without exceptions

24. Which of the following viruses is classified under Group IV of the Baltimore Classification system ?

(A) Retrovirus

(B) Double-stranded DNA virus

(C) Single-stranded RNA virus

(D) Double-stranded RNA virus

25. Which of the following viruses primarily infects insect hosts ?

(A) Adenovirus

(B) Poxvirus

(C) Baculovirus

(D) Paramyxovirus

26. During which step of the viral replication cycle are viral holin and lysin produced ?

(A) Entry

(B) Replication

(C) Assembly

(D) Exit

27. Interferons type I are part of the host 's ..... response to viral infections.

(A) Innate immune

(B) Adaptive immune

(C) Cellular immune

(D) Humoral immune

28. What type of microscopy is used to study morphology of viruses ?

(A) Transmission Electron Microscopy
(B) Scanning Electron Microscopy
(C) Bright Field Microscopy
(D) Fluorescent microscopy

29. The first human virus infection discovered in 1901 was :

(A) Yellow Fever Virus
(B) Polio Virus
(C) Small Pox Virus
(D) Influenza Virus

30. Which of the following viruses are Arboviruses ?

(A) Influenza virus
(B) Coronavirus
(C) Rhinovirus
(D) TogaVirus

31. When bacteriophage λ integrates into the bacterial chromosome, it does so at :

(A) An att P site in the host chromosome.
(B) An att B site in the phage chromosome
(C) An att B site in the host chromosome between gal and bio operons
(D) An att G site in the host chromosome between lys and trp operons

32. MOI stands for :

(A) Multiplicity of Infection
(B) Mutation of Infection
(C) M13 open infection
(D) None of the above

33. Which bacteriophage is commonly used a vector for cloning ?

(A) Lambda (λ) phage
(B) Mu phage
(C) M13 phage
(D) All of the above

34. ELISA stands for :

(A) Enzyme-Linked Immunosorbent Assay
(B) Enzyme Linked Immunological Assay
(C) Enzyme Laced Immunosorbent Assay
(D) Energy Linked Immunosorbent Assay

35. Who gave virus the term "contagiumfluidumvivum" ?

(A) MartinusBeijerinck
(B) Dmitri Ivanovsky
(C) Francis Conrat
(D) D Herelle

36. Which of the following is NOT a mechanism of virus entry into host cells ?

(A) Endocytosis
(B) Fusion with host cell membrane
(C) Direct injection of viral genome
(D) Exocytosis

37. Viruses capable of causing cancerous cell transformation are known as :

(A) Oncogenic Virus
(B) Latent Virus
(C) Persistent Virus
(D) None of the above

38. The stage of virus life cycle which involves packaging of genome into protein coat is known as :

(A) Assembly
(B) Entry
(C) Uncoating
(D) Lysis

39. Which of the following virus infects the liver cells ?

(A) HIV
(B) HBV
(C) TMV
(D) HSV

40. If nucleic acid of TMV strain A is mixed with helical capsid of strain B in vitro, infectious particle after self assembly will result in production of :

(A) TMV strain A
(B) TMV strain B
(C) Hybrid
(D) TMV strain A and TMV strain B

41. Syncytia formation during viral infection is primarily due to :

(A) Viral DNA integration into host genome
(B) Fusion of infected cells with neighboring cells mediated by viral proteins
(C) Apoptosis of infected cells
(D) Viral inhibition of host protein synthesis

42. A type of cell culture that is obtained upon removal from host animal is a :

(A) Primary cell culture
(B) Continuous cell line.
(C) Cell strain
(D) Diploid fibroblast cell

43. Which of the following is not a category of the method of virus detection ?

(A) Infectivity Assay
(B) Hematology
(C) Serology
(D) Nucleic acid detection

44. The term LD_{50} (lethal dose 50%) in virology refers to:

(A) The dose of virus that infects 50% of host cells in culture

(B) The dose of virus that kills 50% of infected experimental animals

(C) The viral concentration that produces cytopathic effects in 50% of cells

(D) The amount of virus required to neutralize 50% of antibodies

45. Replication of bacteriophage Mu is best described as :

(A) Rolling circle replication

(B) Conservative replication

(C) Replicative transposition

(D) Bidirectional theta replication

46. Viruses that infect *Agaricusbisporus* will be known as :

(A) Mycophages

(B) Cyanophages

(C) Bacteriophage

(D) None of the above

47. NPV is abbreviation for :

(A) Nucleus Polyhedronal Virus

(B) Nuclear Polyhedrosis Virus

(C) Nucleus Polygonal Virus

(D) Not possible Virion

48. The primary function of the CRISPR-Cas system in bacteria is :

(A) Protein synthesis

(B) Defense against viral infection

(C) Energy production

(D) Cell wall synthesis

49. Nucleotide analog antiviral drugs primarily act by :

(A) Inhibiting viral entry into host cells

(B) Blocking viral protein synthesis

(C) Inhibiting viral nucleic acid synthesis by chain termination

(D) Enhancing host immune response

50. A key feature of replication in viruses belonging to the Picornaviridae family is :

(A) Replication in the nucleus using host DNA polymerase

(B) Formation of double-stranded DNA intermediates

(C) Use of RNA-dependent RNA polymerase for cytoplasmic replication

(D) Integration into host genome as provirus

51. Which of the following is known as the father of Virology ?

(A) Dmitri Ivanovsky

(B) Francis Conrat

(C) D. Herelle

(D) Martinus Beijerinck

52. Which of the following statements applies to viruses ?

(A) They cannot be observed using a light microscope.

(B) They can be separated from homogenates of host cells using simple filters.

(C) Release of a virus from its host cell is always associated with lysis of the cell.

(D) Viruses are complexes of DNA and proteins.

53. Example of naked icosahedral virus is :

(A) Hepadna Virus

(B) HIV

(C) Adenovirus

(D) Herpes Virus

54. A type of cell culture that can reproduce for an extended number of generations and is used to support viral replication is a :

(A) Primary cell culture

(B) Continuous cell line

(C) Cell strain

(D) Diploid fibroblast cell

55. Which of the following viruses are used for phage display technology ?

(A) M13 virus

(B) RSV

(C) Toga Virus

(D) Rubella Virus

56. Virusoids are also refered to as :

(A) Persistent Virus

(B) Satellite Virus

(C) Slow Virus

(D) Latent Virus

57. Which of the following class consists of ds RNA viruses ?

(A) Class V

(B) Class VII

(C) Class III

(D) Class IV

58. The Tobacco mosaic virus was crystallized for first time by :

(A) W. M. Stanley

(B) Louis Pasteur

(C) Edward Jenner

(D) Andre Lwoff

59. The proteinaceous structure made up of repeated subunits that protects viral genome is known as :

(A) capsomere

(B) capsid

(C) envelop

(D) core

60. Mutator phage is :

(A) T4 phage

(B) Mu phage

(C) Phi X174 phage

(D) M13 phage

61. The first virus to be isolated was :

(A) Herpes Virus

(B) Cauliflower Mosaic Virus

(C) Tobacco Mosaic Virus

(D) Lambda bacteriophage

62. An icosahedron is an object or symmetry with :

(A) 20 faces, 12 vertices, and 30 edges.

(B) 20 faces, 20 vertices, and 30 edges.

(C) 20 faces, 12 vertices, and 20 edges.

(D) None of the above

63. Example of ds DNA Oncogenic Virus is :

(A) Polyoma Virus

(B) Pox Virus

(C) Rota Virus

(D) M13 virus

64. Example of T even phage virus is :

(A) T3 phage

(B) T7 phage

(C) M13 phage

(D) T4 phage

65. What is the most important factor for virus classification ?

(A) genome chemistry

(B) capsid symmetry

(C) presence or absence of envelop

(D) disease caused by the virus

66. Match the following viruses with the type of genetic material they have :

List–I		List–II	
(i)	Double-stranded DNA	(a)	ϕX174
(ii)	Single-stranded DNA	(b)	Lambda phage
(iii)	Double-stranded RNA	(c)	MS2 phage
(iv)	Single-stranded RNA	(d)	Rota Virus

Codes :

(A) i-b, ii-a, iii-d, iv-c

(B) i-b, ii-d, iii-a, iv-c

(C) i-b, ii-c, iii-a, iv-d

(D) i-b, ii-d, iii-c, iv-a

67. What are the morphological features of Rota Virus ?

(A) Indistinct morphology with contractile tail

(B) Double layered protein with spikes

(C) Enveloped virus with glycoprotein spikes

(D) Helical Virus

68. What is the morphology of the tobacco mosaic virus ?

(A) Complex with a membrane and tegument and icosahedron core

(B) Naked virion with over 50 types of spikes

(C) Compact icosahedron structure

(D) Rigid Helical virus

69. The genetic map of phage T4 is circular because :

(1) The sequence is terminally redundant

(2) The sequence is circularly permuted

(3) The sequence is 50 kbp long

Codes :

(A) 1

(B) 2

(C) 3

(D) 1 and 2

70. Viruses can be cultured in all, except ..... .

(A) Chick embryo

(B) Blood agar

(C) Guinea pigs

(D) Tissue Culture

71. In an Indirect ELISA, the enzyme :

(A) is bound by the antibody's antigen-binding site.

(B) is attached to the well of a microtiter plate.

(C) is conjugated to the antigen.

(D) is bound to the constant region of the secondary antibody.

72. Plant insect vectors include :

(A) Mosquito

(B) Cockroach

(C) Aphids

(D) None of the above

73. Which of the following viruses is known for latent infections ?

(A) Pox virus

(B) Rota Virus

(C) Herpes Virus

(D) Toga Virus

74. Potato Spindle Tuber Viroid has :

(A) ds DNa enclosed in capsid

(B) ss linear DNA not enclosed in capsid

(C) ss circular RNA enclosed in capsid

(D) ss circular RNA not enclosed in capsid

75. Example of Whole virus inactivated vaccine :

(A) Covishield

(B) Covaxin

(C) HPV

(D) DPT

76. Potato Virus X is plant pathogenic virus belonging to :

(A) Potex Virus

(B) Potyviridae

(C) Both (A) and (B)

(D) None of the above

77. The presence or absence of particular components on the surface of a host cell that are required for the virus to attach determines its :

(A) Host range

(B) Entry into cell

(C) Both (A) and (B)

(D) None of the above

78. Example of naked icosahedral virus is :

(A) Hepadna Virus

(B) HIV

(C) Adenovirus

(D) Herpes Virus

79. Modified cytosine found in T4 virus is :

(A) 5-hydroxymethylcytosine

(B) 5-methylcytosine

(C) 5-hydroxycytosine

(D) None of the above

80. Which of the following can be used as antiviral therapeutics ?

(A) Aptamers b

(B) Ribozymes

(C) Antisense RNA

(D) All of the above

81. The Herpes Virus contains ..... between envelop and nucleocapsid.

(A) Tegument

(B) Glycoprotein spike

(C) Nucleic Acid

(D) None of the above

82. Methods to control plant virus dispersion include :

(A) Quarantine and removal of infected plants

(B) Using virus free certified seeds

(C) Control of natural vectors

(D) All of the above

83. Transmission caused by virus circulating in the host by infecting insect cells and replicating in the vector is known as :

(A) Circulative, non propagative

(B) Circulative, propagative

(C) Non Circulative

(D) None of the above

84. Which of the following represent antiviral vaccine candidates ?

(A) Live attenuated strains

(B) Recombinant Viral proteins

(C) mRNA

(D) All of the above

85. TMV RNA and protein when mixed :

(A) Will self assemble to form infectious particles

(B) Will not self assemble to form infectious particles

(C) Will self assemble to form non-infectious particles

(D) None of the above

86. HIV gp 120 uses which of the following as host receptors :

(A) CD4 and chemokine receptor

(B) CD8 and chemokine receptor

(C) CXCR4 and chemokine receptor

(D) CXCR8 and chemokine receptor

87. Example of a filamentous virus :

(A) TMV virus

(B) Poty Virus

(C) HIV

(D) Phi X174

88. Difference between RIA and ELISA is in detection of antigen and antibody complex using :

(A) Radioactivity for RIA and enzymes for ELISA

(B) Radioactivity for ELISA and enzymes for RIA

(C) Fluorescence for RIA and enzymes for ELISA

(D) All of the above

89. In lambda phage genome, Cos site :

(A) Represents junction between 2 genome sequence in a concatamer

(B) Represents specific packaging termination sequence.

(C) Represents site for in vitro packaging in cosmid vectors

(D) All of the above

90. Quantitative Real time Polymerase Chain Reaction will be used to quantify :

(A) Viral DNA

(B) Viral protein

(C) Viral particles

(D) Viral RNA

91. Which of the following represent antiviral treatment options ?

(A) Interferons

(B) Viral enzyme inhibitor

(C) Nucleic acid structural analogues

(D) All of the above

92. Pox virus is transmitted by :

(A) Sexual Route

(B) Respiratory Route

(C) Blood borne

(D) None of the above

93. M13 phage is :

(A) Rigid helical

(B) Icosahedral

(C) Complex with Head and Tail

(D) Filamentous

94. The replication of hepatitis B includes which of the following stages ?

(A) Movement of intact virus to the cellular cytoplasm for replication

(B) Conversion of relaxed circular viral DNA in to Covalently Closed Circular (CCC) DNA in the nucleus

(C) Virions produced in the cytoplasm by cellular DNA polymerase

(D) Oncogenic activity to transform neural cells.

95. Institute in India specializing in viral research is :

(A) National Institute of Health

(B) National Virus Research Institute

(C) National Institute of Virology

(D) All India Institute of Medical Sciences

96. Main RNAi agents that can be used in antiviral therapy include :

(A) miRNA, siRNA, shRNA

(B) si RNA, hammerhead ribozyme, shRNA

(C) shDNA, miRNA, hairpin ribozymes

(D) All of the above

97. As per Baltimore's classification, Group ..... contains ss DNA genome viruses.

(A) I

(B) Il

(C) III

(D) IV

98. Bacteriophage was discovered by :

(A) Beijerinck

(B) Joseph Lister

(C) Lous Pasteur

(D) Twort and d'Herelle

99. Virusoids are also refered to as :

(A) Persistent Virus

(B) Satellite Virus

(C) Slow Virus

(D) Latent Virus

100. Viral capsid symmetry shaped in a filamentous or rod-shaped structure that has a central cavity that encloses its nucleic acid is known as :

(A) Icosahedral

(B) Helical

(C) Complex

(D) Capsomere

(Only for Rough Work)

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the correct answer and mark the same in the OMR Answer-Sheet as per the direction :

Example :

Question :

Q. 1 (A) ● (C) (D)
Q. 2 (A) (B) ● (D)
Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.

6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.

7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.

8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.

9. There will be no negative marking.

10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.

11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.

12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. : On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर—A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छाँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)
प्रश्न 2 (A) (B) ● (D)
प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।

6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।

7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।

8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।

9. निगेटिव मार्किंग नहीं है।

10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।

11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।

12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण : प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।