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
C

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. 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

2. 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

3. 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

4. NPV is abbreviation for :
   (A) Nucleus Polyhedronal Virus
   (B) Nuclear Polyhedrosis Virus
   (C) Nucleus Polygonal Virus
   (D) Not possible Virion

5. Viruses that infect *Agaricusbisporus* will be known as :
   (A) Mycophages
   (B) Cyanophages
   (C) Bacteriophage
   (D) None of the above

6. Replication of bacteriophage Mu is best described as :
   (A) Rolling circle replication
   (B) Conservative replication
   (C) Replicative transposition
   (D) Bidirectional theta replication

7. 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

8. 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

9. 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

10. 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

11. 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

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

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

13. 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

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

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

15. 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

16. Who gave virus the term "contagiumfluidumvivum" ?

(A) MartinusBeijerinck

(B) Dmitri Ivanovsky

(C) Francis Conrat

(D) D Herelle

17. ELISA stands for :

(A) Enzyme-Linked Immunosorbent Assay

(B) Enzyme Linked Immunological Assay

(C) Enzyme Laced Immunosorbent Assay

(D) Energy Linked Immunosorbent Assay

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

(A) Lambda (λ) phage

(B) Mu phage

(C) M13 phage

(D) All of the above

19. MOI stands for :

(A) Multiplicity of Infection

(B) Mutation of Infection

(C) M13 open infection

(D) None of the above

20. 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

21. Which of the following viruses are Arboviruses ?

(A) Influenza virus

(B) Coronavirus

(C) Rhinovirus

(D) TogaVirus

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

(A) Yellow Fever Virus

(B) Polio Virus

(C) Small Pox Virus

(D) Influenza Virus

23. 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

24. 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

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

(A) Entry

(B) Replication

(C) Assembly

(D) Exit

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

(A) Adenovirus

(B) Poxvirus

(C) Baculovirus

(D) Paramyxovirus

27. 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

28. 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

29. What is the primary target of HAART therapy ?

(A) HIV

(B) PVY

(C) TMV

(D) SV40

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

(A) Ultracentrifugation

(B) Affinity Chromatography

(C) Ultrafiltration

(D) Electron Microscopy

31. Which of the following causes synergistic pathogenecity ?

(A) PVX and TMV

(B) PVY and TMV

(C) PSTVd

(D) PVX and PVY

32. Which virus causes mosaic symptoms on leaves ?

(A) Herpes simplex virus

(B) Pox virus

(C) TMV

(D) Measles virus

33. In viral genomics, an ORF refers to :

(A) Open Reading Frame

(B) Open Reading Form

(C) Open Reverse Frame

(D) Open Reverse Frame

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

(A) PCR

(B) Southern blot

(C) Gel electrophoresis

(D) ELISA

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

(A) Adenovirus

(B) Herpesvirus

(C) Hepatitis virus

(D) Rotavirus

36. What function does DNA dependant RNA polymerase perform ?

(A) Transcription

(B) Translation

(C) Replication

(D) Reverse transcription

37. 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

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

(A) Paramecium

(B) Bacillus

(C) Prion

(D) TMV

39. In a plaque assay, pfu stands for :

(A) Phase forming unit

(B) Phage forming unit

(C) Plaque forming unit

(D) Paper forming unit

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

(A) Hepatitis B Virus

(B) Japanese Encephalitis Virus

(C) Small Pox Virus

(D) Rabies Virus

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

(A) Guinea Pigs

(B) Mice

(C) Rats

(D) All of the above

42. 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

43. Virus typically used for phage display techniques include :

(A) Lambda phage

(B) T phage

(C) M13 phage

(D) All of the above

44. 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

45. 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

46. 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

47. Negative sense RNA strand is also known as :

(A) Sense RNA

(B) Antisense RNA

(C) cDNA

(D) ribozyme

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

(A) Class V

(B) Class VII

(C) Class III

(D) Class IV

49. POCK assay is usually performed in :

(A) Tissue Culture

(B) Experimental Animal Models

(C) Chick ChorioAllantoic Membrane

(D) Bacterial lawn

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

(A) W. M. Stanley

(B) Louis Pasteur

(C) Edward Jenner

(D) Andre Lwoff

51. 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

52. Virusoids are also refered to as :

(A) Persistent Virus

(B) Satellite Virus

(C) Slow Virus

(D) Latent Virus

53. Bacteriophage was discovered by :

(A) Beijerinck

(B) Joseph Lister

(C) Lous Pasteur

(D) Twort and d'Herelle

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

(A) I

(B) Il

(C) III

(D) IV

55. 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

56. 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

57. 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.

58. M13 phage is :

(A) Rigid helical

(B) Icosahedral

(C) Complex with Head and Tail

(D) Filamentous

59. Pox virus is transmitted by :

(A) Sexual Route

(B) Respiratory Route

(C) Blood borne

(D) None of the above

60. Which of the following represent antiviral treatment options ?

(A) Interferons

(B) Viral enzyme inhibitor

(C) Nucleic acid structural analogues

(D) All of the above

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

(A) Viral DNA

(B) Viral protein

(C) Viral particles

(D) Viral RNA

62. 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

63. 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

64. Example of a filamentous virus :

(A) TMV virus

(B) Poty Virus

(C) HIV

(D) Phi X174

65. 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

66. 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

67. Which of the following represent antiviral vaccine candidates ?

(A) Live attenuated strains

(B) Recombinant Viral proteins

(C) mRNA

(D) All of the above

68. 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

69. 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

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

(A) Tegument

(B) Glycoprotein spike

(C) Nucleic Acid

(D) None of the above

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

(A) Aptamers b

(B) Ribozymes

(C) Antisense RNA

(D) All of the above

72. Modified cytosine found in T4 virus is :

(A) 5-hydroxymethylcytosine

(B) 5-methylcytosine

(C) 5-hydroxycytosine

(D) None of the above

73. Example of naked icosahedral virus is :

(A) Hepadna Virus

(B) HIV

(C) Adenovirus

(D) Herpes Virus

74. 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

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

(A) Potex Virus

(B) Potyviridae

(C) Both (A) and (B)

(D) None of the above

76. Example of Whole virus inactivated vaccine :

(A) Covishield

(B) Covaxin

(C) HPV

(D) DPT

77. 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

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

(A) Pox virus

(B) Rota Virus

(C) Herpes Virus

(D) Toga Virus

79. Plant insect vectors include :

(A) Mosquito

(B) Cockroach

(C) Aphids

(D) None of the above

80. 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.

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

(A) Chick embryo

(B) Blood agar

(C) Guinea pigs

(D) Tissue Culture

82. 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

83. 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

84. 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

85. 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

86. 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

87. Example of T even phage virus is :

(A) T3 phage

(B) T7 phage

(C) M13 phage

(D) T4 phage

88. Example of ds DNA Oncogenic Virus is :

(A) Polyoma Virus

(B) Pox Virus

(C) Rota Virus

(D) M13 virus

89. 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

90. The first virus to be isolated was :

(A) Herpes Virus

(B) Cauliflower Mosaic Virus

(C) Tobacco Mosaic Virus

(D) Lambda bacteriophage

91. Mutator phage is :

(A) T4 phage

(B) Mu phage

(C) Phi X174 phage

(D) M13 phage

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

(A) capsomere

(B) capsid

(C) envelop

(D) core

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

(A) W. M. Stanley

(B) Louis Pasteur

(C) Edward Jenner

(D) Andre Lwoff

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

(A) Class V

(B) Class VII

(C) Class III

(D) Class IV

95. Virusoids are also refered to as :

(A) Persistent Virus

(B) Satellite Virus

(C) Slow Virus

(D) Latent Virus

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

(A) M13 virus

(B) RSV

(C) Toga Virus

(D) Rubella Virus

97. 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

98. Example of naked icosahedral virus is :

(A) Hepadna Virus

(B) HIV

(C) Adenovirus

(D) Herpes Virus

99. 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.

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

(A) Dmitri Ivanovsky

(B) Francis Conrat

(C) D. Herelle

(D) Martinus Beijerinck

(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।