Roll No. .....

Question Booklet Number

O. M. R. Serial No.

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

(New Syllabus Effective from 2023)

ADVANCED IMMUNOLOGY & IMMUNOTECHNIQUES

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)**

(Only for Rough Work)

1. Hassall's corpuscles are found in :

(A) Bone marrow

(B) Thymus

(C) Spleen

(D) Liver

2. Herd immunity refers to :

(A) Individual immunity

(B) Population-level protection

(C) Passive immunity

(D) Innate immunity

3. High endothelial venules are found in :

(A) Bone marrow

(B) Thymus

(C) Lymph nodes

(D) Liver

4. Lymph node paracortex contains :

(A) B cells

(B) T cells

(C) RBCs

(D) Platelets

5. Which response is crucial for viral vaccines ?

(A) Humoral only

(B) NK only

(C) Complement

(D) Cellular (CD8+ T cells)

6. Flow cytometry measures :

(A) Cell properties

(B) DNA sequence

(C) Protein only

(D) RNA

7. Light chains are of the following types :

(A) Alpha and beta

(B) Kappa and lambda

(C) Gamma and delta

(D) Mu and epsilon

8. The antigen-binding site is located in :

(A) Constant region

(B) Fc region

(C) Variable region

(D) Stem region

9. Competitive ELISA is useful for :

(A) High antigen concentration

(B) Low antigen detection

(C) DNA

(D) RNA

10. ELISPOT detects :

(A) DNA

(B) Lipids

(C) RNA

(D) Single-cell cytokine secretion

11. Specificity refers to :

(A) Speed

(B) Ability to detect the correct target

(C) Cost

(D) Mutation

12. Hypervariable regions are also called :

(A) CDRs

(B) CH2/CH3 regions

(C) Fc regions

(D) Constant domains

13. Class switching changes :

(A) Specificity

(B) Constant region

(C) Variable region

(D) DNA sequence

14. Complement activation is mediated by :

(A) Fab

(B) DNA

(C) Fc

(D) RNA

15. The Fc region binds to :

(A) Antigen

(B) Cell receptors

(C) DNA

(D) RNA

16. Enzyme-linked immunosorbent assay (ELISA) detects :

(A) DNA

(B) Lipids

(C) RNA

(D) Antigen

17. Western blot detects proteins with the help of :

(A) RNA polymerase

(B) DNA polymerase

(C) Alkaline phosphatase

(D) Phospholipase C

18. MHC Class II genes in humans are encoded by :

(A) DA, DB, DC

(B) DP, DQ, DR

(C) IL3, IL4, IL5

(D) MMP8, MMP10, MMP8

19. Lysosomes are involved in :

(A) MHC I pathway

(B) MHC II pathway

(C) DNA replication

(D) Protein synthesis

20. TNF stands for :

(A) Tumor Necrosis Factor

(B) Tissue Necrosis Factor

(C) Tumor Neural Factor

(D) Transfer Necrosis Factor

21. Primary immune response is :

(A) Faster

(B) Absent

(C) Stronger

(D) Slower

22. Secondary immune Response is :

(A) Slower

(B) Faster

(C) Weaker

(D) Absent

23. Example of autoimmune disease :

(A) Diabetes (Type 1)

(B) Malaria

(C) Tuberculosis

(D) Influenza

24. Fever is induced by :

(A) Cytokines

(B) DNA

(C) RNA

(D) Lipids

25. Autoimmunity is due to

(A) Molecular mimicry

(B) Central tolerance errors

(C) Bystandar mechanism

(D) All of the above

26. Vaccination induces :

(A) Passive immunity

(B) Active immunity

(C) No immunity

(D) Temporary immunity only

27. Passive immunity provides :

(A) Long-term protection

(B) No protection

(C) Immediate protection

(D) Memory

28. Chronic inflammation is :

(A) Short-term

(B) Long-term

(C) Immediate

(D) Temporary

29. Clonal selection theory explains :

(A) Mutation

(B) Specific immune response

(C) Digestion

(D) Respiration

30. A hapten becomes immunogenic when :

(A) It binds DNA

(B) It binds to lipid

(C) It binds a carrier protein

(D) It mutates

31. Effector B cells are referred as :

(A) Memory Cells

(B) Cytotoxic T Lymphocytes

(C) Stem cells

(D) Plasma cells

32. Which cell lacks MHC I and is thus killed by NK cells ?

(A) Healthy cell

(B) Virus-infected cell

(C) Tumor cell

(D) Both (B) and C)

33. Somatic hypermutation leads to :

(A) Increased antibody diversity

(B) Decreased specificity

(C) Loss of function

(D) DNA damage

34. Which pathway processes endogenous antigen ?

(A) MHC II pathway

(B) Lysosomal pathway

(C) Proteasomal pathway

(D) Endosomal pathway

35. TAP transports peptides into :

(A) Nucleus

(B) Golgi

(C) ER

(D) Lysosome

36. Which is a superantigen effect ?

(A) Specific activation

(B) Massive T-cell activation

(C) No response

(D) Weak response

37. Co-stimulation failure leads to :

(A) Activation

(B) Anergy

(C) Apoptosis

(D) Mutation

38. Negative selection removes :

(A) Weakly binding cells

(B) B cells

(C) All T cells

(D) Self-reactive T cells

39. Positive selection ensures :

(A) Self-reactivity

(B) Mutation

(C) MHC restriction

(D) Apoptosis

40. Which complement component forms MAC ?

(A) C1q-C5

(B) C3b-C5

(C) C5b-9

(D) C2a-C6

41. Autoimmune disease occurs due to :

(A) Foreign Antigen

(B) Auto-reactivity

(C) Infection only

(D) Failure of tolerance

42. Which cytokine suppresses the immune response ?

(A) IL-2

(B) IFN-γ

(C) IL-10

(D) TNF

43. HIV infects cells with :

(A) CD8

(B) CD4

(C) CD3

(D) CD19

44. A child develops recurrent bacterial infections but normal viral resistance. Likely defect ?

(A) T cells

(B) Complement

(C) NK cells

(D) B cells

45. A patient shows the absence of the thymus. Which cells are deficient ?

(A) B cells

(B) T cells

(C) RBCs

(D) Platelets

46. A mutation prevents antibody class switching. Which remains predominant ?

(A) IgG

(B) IgA

(C) IgE

(D) IgM

47. A patient lacks MHC I expression. Which cells fail to activate ?

(A) CD4+ T cells

(B) CD8+ T cells

(C) B cells

(D) Macrophages

48. A dendritic cell presents extracellular Antigen via MHC I. This is :

(A) Normal processing

(B) Cross-presentation

(C) Mutation

(D) Error

49. A patient cannot generate a memory response. Defect in :

(A) Innate immunity

(B) NK cells

(C) Complement

(D) Adaptive immunity

50. A mutation in BTK enzyme affects :

(A) B cells

(B) T cells

(C) Complement

(D) NK cells

51. A patient lacks complement C3. Is the main defect is manifested in ?

(A) Antibody production

(B) Opsonization

(C) T-cell activation

(D) Memory formation

52. The immune system includes :

(A) Only cells

(B) Only proteins

(C) Cells, molecules, and genes

(D) Only DNA

53. A patient produces antibodies but cannot clear intracellular pathogens. Defect is present in :

(A) Humoral immunity

(B) Cellular immunity

(C) Complement

(D) NK cells

54. Innate immunity does NOT :

(A) Recognize pathogens

(B) Use cells

(C) Protect body

(D) Distinguish between antigens

55. A patient has no germinal centres. What is impaired ?

(A) T-cell activation

(B) B-cell proliferation

(C) NK activity

(D) Complement

56. Which cannot act as an antigen ?

(A) Protein

(B) Polysaccharide

(C) Water

(D) Lipid

57. Antigen receptors are present on :

(A) RBCs

(B) Neurons

(C) Platelets

(D) Lymphocytes

58. Haptens require :

(A) DNA

(B) RNA

(C) Carrier protein

(D) Lipids

59. A patient shows high IFN-γ. Effect ?

(A) B-cell suppression

(B) Macrophage activation

(C) NK inhibition

(D) IgE production

60. A tumor evades immunity by reducing antigen presentation. Which pathway is affected ?

(A) MHC I

(B) MHC II

(C) Complement

(D) Cytokines

61. B-cell receptors are :

(A) Antibodies

(B) DNA

(C) Enzymes

(D) Hormones

62. T cells do NOT :

(A) Recognize antigens

(B) Activate immunity

(C) Kill infected cells

(D) Produce antibodies

63. A patient produces many antibodies with low affinity. Defect ?

(A) Class switching

(B) Hypermutation

(C) Complement

(D) Cytokines

64. **Assertion :** Complement activation causes cell lysis.

Reason : MAC forms pores in membranes of its target.

(A) Both Assertion and Reason are true, and Reason is a correct explanation

(B) Both true, but Reason is NOT the correct explanation

(C) Assertion true, Reason false

(D) Assertion false, Reason true

65. **Assertion :** Memory cells are formed in innate immunity.

Reason : Innate immunity lacks specificity.

(A) Both Assertion and Reason are true, and Reason is a correct explanation

(B) Both true, but Reason is NOT the correct explanation

(C) Assertion true, Reason false

(D) Assertion false, Reason true

66. **Assertion :** MHC I is expressed only on APCs.

Reason : APCs present the Antigen.

(A) Both Assertion and Reason are true, and Reason is a correct explanation

(B) Both true, but Reason is NOT the correct explanation

(C) Assertion true, Reason false

(D) Assertion false, Reason true

67. **Assertion :** NK cells require antigen presentation.

Reason : NK cells recognize MHC I.

(A) Both Assertion and Reason are true, and Reason is a correct explanation

(B) Both true, but Reason is NOT the correct explanation

(C) Assertion true, Reason false

(D) Assertion false, Reason true

68. **Assertion :** All APCs express MHC II.

Reason : MHC II is present on all nucleated cells.

(A) Both Assertion and Reason are true, and Reason is a correct explanation

(B) Both true, but Reason is NOT the correct explanation

(C) Assertion true, Reason false

(D) Assertion false, Reason true

69. Passive immunity involves :

(A) Self-production

(B) Transfer of antibodies

(C) Mutation

(D) DNA repair

70. HLA genes code for which molecules :

(A) MHC molecules

(B) DNA

(C) RNA

(D) Lipids

71. B cells respond to :

(A) Intracellular antigens

(B) RNA

(C) DNA

(D) Extracellular antigens

72. T cells mainly target :

(A) Extracellular microbes

(B) Intracellular pathogens

(C) Lipids

(D) Proteins

73. Antibodies recognize antigens in :

(A) Processed form

(B) DNA form

(C) Native form

(D) RNA form

74. Cytokines are produced by :

(A) RBCs

(B) DNA

(C) Platelets

(D) T cells

75. Secondary immune response is :

(A) Faster

(B) Slower

(C) Weak

(D) Absent

76. Effector phase of immune system involves :

(A) Recognition

(B) Activation

(C) Destruction of antigen

(D) Memory formation

77. Diversity refers to :

(A) Same antigen recognition

(B) Multiple antigen recognition

(C) No recognition

(D) Weak response

78. Lymphocyte repertoire means :

(A) Single specificity

(B) Many specificities

(C) No specificity

(D) Weak response

79. Skin is part of :

(A) Adaptive immunity

(B) Cellular immunity

(C) Humoral immunity

(D) Innate immunity

80. The immune system protects genetic integrity by :

(A) Mutation

(B) Destroying foreign agents

(C) Replication

(D) Growth

81. Memory cells are important for :

(A) Secondary Response

(B) First Response

(C) Digestion

(D) Transport

82. Macrophages are derived from :

(A) Lymphocytes

(B) Monocytes

(C) Neutrophils

(D) Basophils

83. Macrophages function mainly in :

(A) Oxygen transport

(B) Clotting

(C) Hormone secretion

(D) Phagocytosis

84. Dendritic cells are specialized for :

(A) Oxygen transport

(B) Antigen presentation

(C) Antibody secretion

(D) Digestion

85. The most potent antigen-presenting cells are :

(A) Neutrophils

(B) RBCs

(C) Dendritic cells

(D) Platelets

86. Neutrophils are :

(A) Lymphocytes

(B) Phagocytic cells

(C) Hormonal cells

(D) Memory cells

87. Eosinophils are mainly involved in :

(A) Parasitic infection

(B) Viral infection

(C) Bacterial infection

(D) Cancer

88. Basophils release :

(A) Antibodies

(B) Enzymes

(C) DNA

(D) Histamine

89. Natural killer (NK) cells are part of :

(A) Adaptive immunity

(B) Innate immunity

(C) Humoral immunity

(D) Artificial immunity

90. NK cells kill :

(A) Bacteria

(B) RBCs

(C) Virus-infected cells

(D) Platelets

91. Which type of vaccine contains weakened but live pathogens ?

(A) Inactivated vaccine

(B) Subunit vaccine

(C) Live attenuated vaccine

(D) DNA vaccine

92. Antigen trapping mainly occurs in :

(A) Bone marrow

(B) Secondary lymphoid organs

(C) Muscles

(D) Brain

93. Germinal centres are found in _____ and are sites for maturation of _____.

(A) Bone marrow ; B cells

(B) Liver; Kupffer cells

(C) Thymus; T cells

(D) Lymph nodes; B cells

94. Which vaccine type is safest for immunocompromised individuals ?

(A) Live attenuated

(B) Vector vaccine

(C) DNA vaccine

(D) Inactivated

95. Lymphocytes circulate through :

(A) Blood only

(B) Lymph only

(C) Blood and Lymph

(D) Air

96. NK cells recognize targets by :

(A) Lack of Antibodies

(B) Lack of MHC I

(C) Breakdown of DNA

(D) Breakdown of RNA

97. Adjuvants are added to vaccines to :

(A) Enhance immune Response

(B) Sensitize pathogens

(C) Reduce cost

(D) Increase mutation

98. Peyer's patches are found in :

(A) Liver

(B) Intestine

(C) Brain

(D) Kidney

99. MALT stands for :

(A) Muscle-associated lymphoid tissue

(B) Memory-associated lymphoid tissue

(C) Mucosa-associated lymphoid tissue

(D) Microbial-associated lymphoid tissue

100. Which vaccine type induces the strongest cellular immunity ?

(A) Subunit

(B) Inactivated

(C) Live attenuated

(D) Toxoid

(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।