

Roll. No.

Question Booklet Number

O.M.R. Serial No.

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B.Sc. (PART-II) EXAMINATION, 2021

BIOTECHNOLOGY

[PAPER : Fourth (BBT-204)]

(Immunology and Immunotechnology)

Paper ID

5

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Question Booklet

Series

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Time : 1 : 30 Hours

Max. Marks : 150

Instructions to the Examinee :

परीक्षार्थियों के लिए निर्देश :

1. Do not open this Booklet until you are told to do so.
2. Candidates should fill their roll number, subject and series of question booklet details correctly, otherwise, in case of any discrepancy in the evaluation, it will be the responsibility of the examinee himself.
3. There are 100 questions in the booklet. Examinee is required to answer only 75 questions in the OMR Answer Sheet provided. Four alternative answer to each question are given below the question, out of these four only one answer is correct. The answer which you think is correct or most appropriate, completely fill in the circle containing its letter in your answer sheet (O.M.R. Answer Sheet) with black or blue ball point pen.

1. जब तक कहा न जाये, इस प्रश्नपुस्तिका को न खोलें।
2. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सिरिज का विवरण यथास्थान सही-सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
3. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को केवल 75 प्रश्नों का उत्तर दी गई OMR उत्तर-पत्रक में देना है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर-पत्रक (O.M.R. Answer Sheet) में उसके अक्षर वाले वृत्त को काले या नीले बॉल प्वाइंट पेन से पूरा भर दें।

(Remaining instructions on last page)

(शेष निर्देश अन्तिम पृष्ठ पर)

ROUGH WORK

1. In all the following vaccines which one doesn't produce long standing memory cells ?
 - (A) Pneumococcal polysaccharide vaccine (PPSV)
 - (B) Haemophilus influenzae type B vaccine (Hib)
 - (C) Heptavalent pneumococcal conjugate Vaccine (PCVT)
 - (D) Measles, mumps and rubella vaccine (MMR)
2. The innate immune system includes the following components, except :
 - (A) Lung surfactant
 - (B) Complement
 - (C) NK cells
 - (D) B-lymphocytes
3. Regarding the immune system, which statement is wrong ?
 - (A) Antibodies play a crucial role in the innate immunity of the neonate
 - (B) The classical pathway of complement activation is part of adaptive immunity
 - (C) C-reactive proteins is produced by the liver
 - (D) None of the above is true
4. What immune cell type predominates in the perfollicular regions of the white pulp in the spleen ?
 - (A) T-lymphocytes
 - (B) B-lymphocytes
 - (C) Macrophages
 - (D) Plasma cells
5. What receptor is present on the surface of all naive B cells ?
 - (A) IgM and IgD
 - (B) IgM and IgG
 - (C) IgM and IgA
 - (D) IgG and IgD
6. Natural killer cells are :
 - (A) leukocytes
 - (B) a predominant cell in adaptive immunity
 - (C) have the ability to kill a cell without prior sensitisation
 - (D) kill cells that over. express class I MHC molecules such as tumour cells
7. Regarding cytokines :
 - (A) They are specific for one cell type
 - (B) Their main role is in innate immunity
 - (C) They act exclusively as stimulators for immune response
 - (D) They are often redundant
8. Mast Cells are :
 - (A) Bone-marrow derived cells
 - (B) Are the primary cell involved in type II hypersensitivity reactions
 - (C) Inhibit platelet activation but are otherwise inflammatory cells
 - (D) Can phagocytose antigen

9. Vaccinations help to prepare the body to fight invading pathogen (specific) by :
 - (A) Inhibiting antigen production
 - (B) Stimulating antibody production
 - (C) Inhibiting WBC production
 - (D) Stimulating RBC production
10. Antibodies and Antigen interacts in spleen. In addition to its role in promoting this interaction, what is the primary function of the spleen ?
 - (A) Secrete digestive enzymes
 - (B) Secrete systemic hormones
 - (C) Synthesize most serum proteins
 - (D) Filter senescent red blood cells
11. Which of these is a lymphoid organ that is active in young children, but decreases in size and importance in adulthood ?
 - (A) Spleen
 - (B) Adenoids
 - (C) Lymph nodes
 - (D) Thymus
12. Which lymphoid organ is the site of erythrocyte, leukocyte and lymphocyte production ?
 - (A) Thymus
 - (B) Lymph nodes
 - (C) Spleen
 - (D) Tonsils
13. What lymphoid organ is one of the primary sites of cancer metastasis ?
 - (A) Thymus
 - (B) Lymph nodes
 - (C) Spleen
 - (D) Tonsils
14. Which type of hypersensitivity reaction is mediated via IgG and IgM binding to self antigen and marking them out to the body for destruction ?
 - (A) Type I
 - (B) Type II
 - (C) Type III
 - (D) Type IV
15. Which type of Hypersensitivity reaction causes rapid anaphylaxis in response to an allergen ?
 - (A) Type I
 - (B) Type II
 - (C) Type III
 - (D) Type IV
16. Anaphylactic shock quickly following a bee sting is mediated through the actions of which cell type ?
 - (A) B cells
 - (B) T cells
 - (C) Mast cells
 - (D) Dendritic cells

17. Which of the following is not a part of the lymphatic system ?
 (A) Bone-marrow
 (B) Thymus and spleen
 (C) Liver
 (D) Adenoids and tonsils
18. Which of the following is a primary lymphoid structure ?
 I. Thymus
 II. Spleen
 III. Lymph node
 (A) I only
 (B) I, II and III
 (C) III only
 (D) II and III only
19. Which of the following cell types of the innate immunity does not perform phagocytosis ?
 (A) Neutrophils
 (B) Basophils
 (C) Macrophages
 (D) Eosinophils
20. Humoral immunity is a type of adaptive immunity that results in the circulation of which of the following throughout the blood ?
 (A) Antigens
 (B) Macrophages
 (C) Natural killer cells
 (D) Antibodies
21. Recognition of self v/s non-self by the adaptive immune system in humans is accomplished in which of the following ways ?
 (A) Exposure of B cells to the body's own antigen in the thymus
 (B) Exposure of B cells to the body's own antigen in bone-marrow
 (C) Exposure of T cells to the body's own antigen in bone-marrow
 (D) Exposure of T cells to the body's own antigen in the thymus
22. Which portion of an antibody provides antigen-binding sites ?
 (A) Light Chain
 (B) Constant portion
 (C) Heavy chain
 (D) Variable portion
23. Which of the following is not one of three main antigen-presenting cell types ?
 (A) Dendritic cells
 (B) B lymphocytes
 (C) Natural killer cells
 (D) Macrophages
24. MHC refers to a large group of genes that code for proteins that play an essential role in which of the following ?
 (A) Phagocytosis by macrophages
 (B) Antigen presentation to T lymphocytes
 (C) Phagocytosis by neutrophils
 (D) Antigen presentation to B lymphocytes

25. Which of the following cells is involved in cell mediated immunity ?
- (A) Leukaemia
 - (B) T-cells
 - (C) Mast cells
 - (D) Thrombocytes
26. Interferons are :
- (A) Cytokine barriers
 - (B) Physical barriers
 - (C) Cellular barriers
 - (D) Physiological barriers
27. Monocytes differentiate into which kind of phagocytic cells ?
- (A) Neutrophil
 - (B) B-cell
 - (C) Macrophage
 - (D) T-cell
28. Which one of the following is a primary lymphoid organ ?
- (A) Lymph nodes
 - (B) Spleen
 - (C) Peyer's Patch
 - (D) Thymus
29. Antibodies are produced by :
- (A) Plasma cells
 - (B) T-cells
 - (C) Bone-marrow
 - (D) Macrophages
30. A single antigen molecule may be composed of many individual :
- (A) T-cell receptors
 - (B) B-cell receptors
 - (C) MHC-II
 - (D) Epitopes
31. The purpose of the immune system is to :
- (A) Help germs invade the body
 - (B) Fight off sickness
 - (C) Make your nose run
 - (D) Give you diarrhea
32. The immune system is made up of :
- (A) Tissues
 - (B) Organs
 - (C) Cells
 - (D) All of the above
33. As part of the immune system, white blood cells fight germs. Another name for white blood cells is :
- (A) Rhinovirus
 - (B) Leukocytes
 - (C) Glands
 - (D) Nodes

34. Passive immunity is :
 (A) Acquired through natural overt or latent infection
 (B) Acquired through vaccination
 (C) Acquired through readymade antibodies
 (D) Acquired by activating immune system of the body
35. Passive immunity is obtained through injecting :
 (A) Antibiotics
 (B) Vaccines
 (C) Antibodies
 (D) Antigens
36. Innate behaviour are :
 (A) Under strong genetic control
 (B) Performed in virtually the different way by all individuals of a species
 (C) Sociobiology
 (D) The environment
37. Kinds of innate immunity barriers are :
 (A) External barriers such as skin, secretions, Mucous membranes
 (B) Internal defenses such as Inflammatory response
 (C) Both (A) and (B)
 (D) None of the above
38. The inflammatory response produced :
 (A) by microbial-infected cells
 (B) internal tissue injury
 (C) migration of erythrocyte from the spleen
 (D) All of the above
39. Acquired immunity is a result of previous exposure :
 (A) Serious illness
 (B) To vaccination
 (C) Repeated exposure to the same factor
 (D) Treatment with penicillin
40. B cells mature in the while T-cells mature in the
 (A) Thymus / bone-marrow and GALT
 (B) Spleen /bone-marrow and GALT
 (C) Bone marrow and GALT / Thymus
 (D) Liver / Kidneys
41. The branch of biology, which involves the study of immune system in all organism is called :
 (A) Microbiology
 (B) Biotechnology
 (C) Immunology
 (D) Zoology
42. Which of the following immunity is obtained during life time ?
 (A) Acquired immunity
 (B) Active immunity
 (C) Passive immunity
 (D) None of these
43. How many types of antibodies are there ?
 (A) Five
 (B) Three
 (C) Two
 (D) Four

44. Leukocytes are found in lots of places, including an organ in your belly that filters blood and helps fight infections known as the :
- (A) Heart
 - (B) Spleen
 - (C) Kidneys
 - (D) Brain
45. The four main types of germs are :
- (A) Viruses, bacteria, parasites and fungi
 - (B) Viruses, parasites, fungi and phagocytes
 - (C) Parasites, bacteria, lymphocytes and fungi
 - (D) Small, medium, large and extra large
46. To be "Immune" means what ?
- (A) That you are infected
 - (B) That you are bald
 - (C) That you are more likely to get sick
 - (D) That you are protected
47. Lymph nodes are found in the :
- (A) Neck
 - (B) Armpits
 - (C) Groin
 - (D) All of the above
48. When someone's immune system overreact to something harmless it's called :
- (A) Over reactus maximus
 - (B) An allergy
 - (C) A sneeze
 - (D) The measles
49. Which of the following will not help your immune system ?
- (A) Playing sports video games
 - (B) Exercising
 - (C) Eating healthy food
 - (D) Regularly washing your hands
50. Which class of the molecules is the most antigenic ?
- (A) Polysaccharides
 - (B) Lipids
 - (C) Proteins
 - (D) Carbohydrates
51. MHC-I molecules present :
- (A) Processed foreign antigen from proteosome
 - (B) Processed self-antigen from phagolysosome
 - (C) Antibodies
 - (D) T-cell antigens
52. Which type of antigen-presenting molecule is found on all nucleated cells ?
- (A) MHC-II
 - (B) MHC-I
 - (C) Antibodies
 - (D) B-cells receptors

53. In systemic anaphylaxis :
- (A) The severity of the response is proportional to the concentration of the antigen
 - (B) There is widespread oedema, but the larynx is spared
 - (C) A previous history of some form of allergy is always present
 - (D) The symptoms usually follow administration of foreign proteins
54. Which of the following cells can be found as tissue residents, meaning they do not have to exit the blood in order to be a part of the immune response ?
- (A) Monocytes
 - (B) Macrophages
 - (C) Neutrophils
 - (D) T cells
55. When are eosinophils able to act as a phagocyte ?
- (A) When the pathogen is a bacterium
 - (B) When the pathogen is a parasitic worm
 - (C) When the pathogen has been processed
 - (D) When the pathogen is coated in antibodies
56. Which of the following is not a non-specific defence against a pathogen ?
- (A) Complement
 - (B) Antibodies
 - (C) Defensins
 - (D) Lysozyme
57. Which of the following is not a direct function of antibodies produced during the immune response ?
- (A) Toxin neutralization
 - (B) Opsonization
 - (C) Activation of inflammation
 - (D) ADCC
58. Choose the incorrect pairing from the options below :
- (A) MHC-II → dendritic cell
 - (B) Cytotoxic T cell → CD4
 - (C) MHC-I → dendritic cell
 - (D) Helper T → cell cytokine release
59. Which of the following is not a type of T cell ?
- (A) Regulatory
 - (B) Helper
 - (C) Cytotoxic
 - (D) Plasma
60. Feature of memory cells include :
- (A) Faster reaction when infected with the same thing again
 - (B) Constantly create antibodies to ward off infection
 - (C) Survive longer than effector B and T cells
 - (D) Both (A) and (C) are correct
61. What is the purpose of regulatory T cells ?
- (A) Reverse the functioning of helper and cytotoxic T cells
 - (B) Prevent B cells from acting on "self antigen"
 - (C) Decrease inflammation
 - (D) Soak up extra antibodies to regulate the humoral response

62. Which of the following convey the longest lasting immunity to an infectious agent ?
- (A) Naturally acquired passive immunity
 - (B) Artificially acquired passive immunity
 - (C) Naturally acquired active immunity
 - (D) All of these
63. Which of the following immune cells/ molecules are most effective at destroying intracellular pathogens ?
- (A) T helper cells
 - (B) B cells
 - (C) Antibodies and complement
 - (D) T cytolytic cells
64. B cells that produce and release large amount of antibody are called :
- (A) Memory cells
 - (B) Basophils
 - (C) Plasma cells
 - (D) Killer cells
65. The specificity of an antibody is due to :
- (A) Its valence
 - (B) The heavy chains
 - (C) The Fe portion of the molecule
 - (D) The variable portion of the heavy and light chain.
66. B cells are activated by :
- (A) Complement
 - (B) Antibody
 - (C) Interferon
 - (D) Antigen
67. Monoclonal antibodies recognize a single :
- (A) Antigen
 - (B) Bacterium
 - (C) Epitope
 - (D) Virus
68. Cell mediated immunity is carried out by while humoral immunity is mainly carried out by
- (A) B cells / T cells
 - (B) Epitopes / Antigens
 - (C) T cells / B Cells
 - (D) Antibodies / Antigens
69. Which of the following statement is true about the IgM of humans ?
- (A) IgM can cross the placenta
 - (B) IgM can protect the mucosal surface
 - (C) IgM is produced from high affinity plasma cells
 - (D) IgM is primarily restricted in the circulation
70. The paracortical area of a lymph node comprises mainly :
- (A) Follicular dendritic cells
 - (B) Macrophages
 - (C) B-cells
 - (D) T-cells

71. Vasodilation following a type I hypersensitivity reaction is principally caused by which molecule ?
- (A) Histamine
 - (B) Leukotriene
 - (C) Bradykinin
 - (D) IL-4
72. Which of the following is the cause of autoimmune disease ?
- (A) Immune system begins to attack its cells and tissues
 - (B) Immune system starts producing cells and tissues
 - (C) Immune system fails completely
 - (D) Immune system produce WBC in a huge number
73. Which of the following is not an autoimmune disorder ?
- (A) Rheumatoid Arthritis
 - (B) Multiple sclerosis
 - (C) Influenza
 - (D) Chronic Hepatitis
74. Which of the following is not an immune system disorder ?
- (A) Allergies
 - (B) Immuno deficiency
 - (C) Genetic disorders
 - (D) Autoimmune disease
75. Which of the following statements is incorrect regarding Rheumatoid Arthritis ?
- (A) It is an autoimmune disorder
 - (B) It occurs only in old people
 - (C) Inflammation of synovial fluid
 - (D) Diagnosed by the presence of rheumatoid factor
76. Agglutination reaction is more sensitive than precipitation for the detection of :
- (A) Antigen
 - (B) Antibodies
 - (C) Complement
 - (D) Ag-Ab complexes
77. Ring test is used for :
- (A) C-reactive protein test
 - (B) Ascoli thermo precipitation test
 - (C) Typing of streptococci and pneumococci
 - (D) All of the above
78. Monoclonal antibody production requires :
- (A) Mouse splenic lymphocytes
 - (B) Mouse myeloma cells
 - (C) Both (A) and (B)
 - (D) None of these
79. Synthesis of antibodies takes place by which of the following cells ?
- (A) Bone-marrow cells
 - (B) T-cells
 - (C) B-cells
 - (D) Lymph

80. Immunity acquired after an infection is :
 (A) Active immunity
 (B) Passive immunity
 (C) Innate immunity
 (D) Both (B) and (C)
81. Immunological destruction of body tissue or product due to antibodies reacting with it as antigen is called :
 (A) Anaphylaxis
 (B) Autoimmune disease
 (C) Prophylaxis
 (D) Immunodeficiency disease
82. Increased asthmatic attack in certain seasons are due to :
 (A) Inhalation of seasonal pollen
 (B) Heat and humidity
 (C) Low temperature
 (D) Eating preserved fruits
83. Inflammation reaction is brought about by :
 (A) Plasma cells
 (B) Mast cells
 (C) Macrophages
 (D) Adipose cells
84. Inflammatory response in allergy is due to release by mast cells of :
 (A) Antibodies
 (B) Antigens
 (C) Histamines
 (D) All of the above
85. Innate immunity is provided by :
 (A) Phagocytes
 (B) Antibodies
 (C) T-Lymphocytes
 (D) B-Lymphocytes
86. Innate immunity is :
 (A) Active acquired immunity
 (B) Passive acquired immunity
 (C) Inborn immunity
 (D) Both (B) and (C)
87. Which one engulfs foreign materials ?
 (A) Macrophages
 (B) Plasma cells
 (C) Mast cells
 (D) Lymphocytes
88. Macrophages are derived from :
 (A) Neutrophils
 (B) Lymphocytes
 (C) Monocytes
 (D) Basophils
89. Memory cells are formed from :
 (A) Erythropoietic stem cells
 (B) Monocytes
 (C) T-Lymphocytes
 (D) B-Lymphocytes

90. The basic structure of antibodies is :
 (A) Y-shaped
 (B) X-shaped
 (C) Linear
 (D) Hyperbolic
91. Name of the class of immunoglobulin which has a pentameric structure ?
 (A) IgE
 (B) IgG
 (C) IgA
 (D) IgM
92. Which immunoglobulin is the principal one found in secretions such as milk ?
 (A) IgG
 (B) IgM
 (C) IgA
 (D) IgD
93. Which immunoglobulin can pass through placenta ?
 (A) IgD
 (B) IgE
 (C) IgM
 (D) IgG
94. Which of these immunoglobulins is present in external secretion ?
 (A) IgG
 (B) IgM
 (C) IgA
 (D) IgE
95. The inappropriate response of immune system towards a relatively harmless antigen causing harm to the host is referred as :
 (A) Hypersensitivity
 (B) Auto-immune disease
 (C) Immuno deficiency
 (D) Tolerance
96. Which of the following Ig is involved in mediating allergic reactions ?
 (A) IgG
 (B) IgM
 (C) IgE
 (D) IgA
97. Majority of autoimmune disease are :
 (A) Cell mediated
 (B) Antibody mediated
 (C) Macrophage mediated
 (D) Mast cell mediated
98. In severe combined immune deficiency (SCID), the patients are deficient in :
 (A) B-Cells
 (B) T-Cells
 (C) Both (A) and (B)
 (D) IgA
99. HIV attacks :
 (A) T helper cells
 (B) T cytotoxic cells
 (C) B cells
 (D) Macrophages
100. All the following is required in B-cell class switch, except :
 (A) Peptide Antigen
 (B) Th-1 cytokines profile
 (C) CD40-CD40L
 (D) MHC-II TCR

ROUGH WORK

ROUGH WORK

Example :

Question :

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

If more than 75 questions are attempted by candidate, then the first attempted 75 questions will be considered for evaluation.

4. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
5. 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.
6. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
7. After the completion of the examination, candidates should leave the examination hall only after providing their question booklet and OMR Answer Sheet separately to the invigilator.
8. There will be no negative marking.
9. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
10. To bring and use of log-book, calculator, pager & cellular phone in examination hall is prohibited.
11. 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.

उदाहरण :

प्रश्न :

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

यदि परीक्षार्थी द्वारा 75 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 75 उत्तरों को ही मूल्यांकन हेतु सम्मिलित किया जाएगा।

4. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
5. सभी उत्तर केवल ओ०एम०आर० 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।
6. ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
7. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक-पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
8. निगेटिव मार्किंग नहीं है।
9. कोई भी रफ कार्य, प्रश्न-पुस्तिका में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
10. परीक्षा-कक्ष में लॉग-बुक, कैल्कुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
11. 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 प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।