REV-01
MBT/01/05

M.Sc. BIOTECHNOLOGY
SECOND SEMESTER (REPEAT)
IMMUNOLOGY
MBT-202
[USE OMR SHEET FOR OBJECTIVE PART]

SET A

Duration: 3 hrs. Full Marks: 70

Objective

Time: 30 mins. Marks: 20

Choose the correct answer from the following: *1×20=20*

1. The concept of attenuation was developed in context to:
   a. Less production of microbial cells
   b. Lessening of infectivity of the microbes
   c. Microbes becoming in active
   d. All of them
2. The pH of skin allows the growth of:
   a. Bacteria
   b. Virus
   c. Fungus
   d. All of the above
3. Plasma therapy does include:
   a. Oral vaccine
   b. Transfer of preformed antibodies
   c. Transcytosis of antibodies
   d. All of the above except b
4. Activation of macrophages depend upon:
   a. Interaction with antigen
   b. Interaction with antigen-MHC class II
   c. Cytokines secreted by T_H cells
   d. All of the above
5. Which of the following is NOT true for Follicular Dendritic cells?
   a. They are found in Follicles
   b. They have receptors for Abs
   c. Activates T_H cells
   d. Non-phagocytic cell
6. What is not found in primary follicles?
   a. Germinal center
   b. B cells
   c. Macrophage
   d. None of the above
7. The extensive tissue damage by releasing histamine:
   a. Macrophages
   b. Neutrophils
   c. Only a and b
   d. Mast cells
8. Positive selection in bone marrow is to remove:
   a. B cells acting against grafts
   b. B cells acting against self-components
   c. B cells acting against BSA
   d. B cells against B cells from another individual
9. Receptor for antibody binding on the surface of basophils is specifically for:
   a. IgG
   b. IgM
   c. IgA
   d. None of the above
10. Which of the following statement is true?
    a. Steroids are haptens
    b. Adjuvants increases immunogenicity
    c. Epitopes and antigenic determinants are synonyms
    d. None of the above

11. Why IgD has an extra domain in its structure?
    a. Question is wrong
    b. Because of extra amino acids
    c. Because of an extra β sheets
    d. The question is wrong

12. Secretory component in IgA is derived from a pathway called:
    a. Opsonization
    b. Receptor mediated endocytosis
    c. ADCC
    d. Phagocytosis

13. Which of the following does not explain antibody structure?
    a. 2 β pleated sheets with antiparallel β strands
    b. Variable domain of 110 amino acids
    c. Domain stabilized by intrachain disulphide linkage
    d. Hydrophobic bonds inside the antibody structure

14. Properdin increases the half-life of:
    a. C5b6
    b. C4b2b
    c. C3bBb
    d. C3bBb3b

15. C5 convertase initiates:
    a. Opsonization
    b. Viral neutralization
    c. Smooth muscle contraction
    d. MAC formation

16. Which of the following does not explain prozone effect?
    a. Antibodies which cannot bind to antigens
    b. Antibodies which are univalent
    c. Antibodies which are more than antigens
    d. Antigens which are polyvalent

17. How are results analyzed in the precipitation reaction?
    a. Presence or absence of absence of antibodies
    b. Presence or absence of absence of antigens
    c. Analysis of precipitation arcs
    d. None of the above

18. Erythroblastosis details is when:
    a. Mother is positive and baby is positive
    b. Mother is negative and foetus is negative
    c. Mother is negative and baby is positive
    d. Mother is negative and foetus is positive

19. How C5b of complement activation is involved in type opsonization?
    a. Upregulation of CR
    b. Increase in the generation of C3b
    c. Downregulation of CR
    d. Increase production of Abs

20. SLE develops when autoantibodies are produced against:
    a. RBC
    b. Proteins
    c. Histones
    d. All of the above

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Descriptive

Time : 2 hr. 30 mins. Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. What is plasma and how was it significant during Covid 19? Justify your answer. Explain how inflammatory responses play a role in killing invading microbes. What is the principle of vaccination and what is the relation with attenuation? 3+4+3=10

2. Explain the structure of lymph nodes with a neat diagram. An injection containing pathogen was given to an individual into his blood. Explain the immune response and which organ of the body is involved. Explain opsonization in context to macrophage. 4+4+2=10

3. Explain the structure of antibodies with help of IgM and explain how it protects the fetus from in its early months inside mother's womb. Explain how precipitation reaction is done in gels with the help of immunoelectrophoresis. Mention its importance. Explain the activity of an active dendritic cell. 4+3+3=10

4. Explain how to increase the immunogenicity of predinisone, a steroid hormone and what is the benefit of such experiment? Explain in your own language how IgA give us protection against invading microbes. What was the use of discovery of multiple myeloma in antibody sequencing? What are the findings of L-chain sequencing? Give reasons why some vaccines use adjuvants. 2+3+1+3+1=10

5. Explain the structure of MHC II molecules with a neat diagram. What is the importance of expression of class I MHC molecules during an immune response against virus infection? What determines the strength of antigen-antibody interaction? Justify your answer. Is there any use of immune response in detection of pregnancy using home pregnancy test kit? Give your justification. What is agglutination reaction? 3+2+1+2+2=10

6. What is the importance of the classical pathway of complement activation? Explain the mechanism. Justify your answer. Explain the use of C5 convertase in eliminating bacterial cells. Explain the mechanism. What is the importance of immune clearance? Justify your answer with an example. 3+4+3 =10

7. What is the use of rocket electrophoresis in the field of clinical diagnosis? Explain with the help of the process. How will you interpret the results of competitive ELISA? Which technique is mostly commonly used - RIA or ELISA? Justify your answer. Define affinity and avidity. Which one explains higher strength of antigen-antibody interaction? 3+2+2+3=10

8. Explain Hashimoto's thyroiditis and Rheumatoid Arthritis. Is there any relation between type IV hypersensitivity and TB? Justify your answer with reasons. What is the importance of Ca^{2+} ions in degranulation of basophils and mast cells? Explain pernicious anemia. 3+3+2+2=10

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