

M.Sc. MICROBIOLOGY  
THIRD SEMESTER  
IMMUNOLOGY  
MMB-301

**SET  
B**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

Marks: 20

( Objective )

Choose the correct answer from the following:

1 × 20 = 20

- Why IgM has an extra domain in its structure?
  - Question is wrong
  - Because of extra amino acids
  - Because of an extra  $\beta$  sheets
  - Because of intrachain disulphide bond
- Secretory component in IgA is derived from a pathway called:
  - Opsonization
  - Receptor mediated endocytosis
  - ADCC
  - Phagocytosis
- Which of the following does not explain antibody structure?
  - 2  $\beta$  pleated sheets with antiparallel  $\beta$  strands
  - Variable domain of 110 amino acids due to intrachain disulphide bond
  - H-L chains are stabilized by interchain disulphide linkage
  - Hydrophobic side chains inside and hydrophilic side chains outside the antibody structure
- Properdin increases the half-life of:
  - C5b6
  - C4b2b
  - C3bBb
  - C3bBb3b
- C5 convertase is otherwise:
  - C4b2a3b
  - C3bBb3b
  - Both a and b
  - C1q4b3b
- Which of the following determine the binding of a peptide to MHC complex?
  - Peptide binding cleft of MHC
  - The presence of CLIP
  - Size of the antigenic peptides
  - All of the above
- How results are analysed in RIA?
  - Measure the number labeled Ag attached to Ab
  - To assess the number free unlabeled Ag
  - To assess the number free labeled Ag
  - None of the above
- What is the outcome of infiltration of inflammatory cells during graft transplantation?
  - Killing of histoincompatible cells
  - Necrosis occurring within 10<sup>th</sup> day
  - No vascularization
  - All of the above
- How C5b of complement activation is involved in opsonization?
  - Upregulation of CR
  - Increase in the generation of C3b
  - Downregulation of CR
  - Increase production of Abs

10. How to increase the efficacy of DNA vaccines, which is supposed to be the advanced hypothesis?
- a. Insertion of antigenic protein gene along with gene for chemokines
  - b. Insertion of more than one gene encoding proteins
  - c. A marker gene
  - d. All of the above
11. The concept of attenuation was developed in context to:
- a. Less production of exotoxins
  - b. Pathogens are inactivated
  - c. Lessening of infectivity of the microbes
  - d. None of the above
12. Heightened secondary immune response is due to the activity of:
- a. Naïve T cells
  - b. Naïve B cells
  - c. Lysozyme
  - d. Memory cells
13. Plasma therapy does include:
- a. Oral vaccine
  - b. Transfer of preformed antibodies
  - c. Transcytosis of antibodies
  - d. All of the above except b
14. Autoimmune disease is due to the abnormality in:
- a. Recognition between self and non self
  - b. Non specificity of lymphocytes
  - c. Inappropriate response of immune cells
  - d. Both a and c
15. Follicular Dendritic cells express:
- a. Receptors for Ag-Ab binding
  - b. Class II MHC
  - c. CD28
  - d. All of the above
16. Secondary follicles are NOT found in the following:
- a. Tonsils
  - b. Payer's patch
  - c. Medulla of Thymus
  - d. Marginal zone
17. Which is the ODD one out?
- a. Appendix
  - b. Thymus
  - c. Peyer's patch
  - d. Bone marrow
18. Positive selection in thymus is to remove:
- a. T cells acting against grafts
  - b. T cells acting against self-components
  - c. T cells acting against BSA
  - d. T cells against T cells from another individual
19. CD 16 is used for the response called:
- a. ADCC
  - b. Opsonization
  - c. Phagocytosis
  - d. All of the above
20. Which of the following statement is true?
- a. Haptens are immunogenic
  - b. Haptens are antigenic
  - c. Haptens-carrier conjugate is immunogenic
  - d. Hapten-lipid conjugate is immunogenic

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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 the meaning of the term "attenuation" and what is the significance of the term in the field of vaccination? Explain how the skin layers of our body protect us from invading microbes? Why sometime our skin cannot give protection and during what type of infection? What is the importance of specificity in vaccination? Give reason for your answer. Expand phagocytosis with a suitable diagram. Define inflammatory response. 2+3+2+2+1=10
2. Explain the structure of thymus with a neat diagram. What is the mechanism of neutralization of infection in MALT? Explain the process and give the importance of germinal center in the process. An injection containing a pathogen was given to an individual in his muscles. Explain in your own words how they will encounter lymphocytes and in which organ of the body. How can you differentiate between a monocyte and an active macrophage? Write it in your own words. 3+3+2+2=10
3. Explain the structure of antibodies with help of IgE and write about its function. An individual was transfused for the first time with blood A when his blood type was B leading to its immediate rejection. Explain how an immediate response occurred. Explain how preformed antibodies against blood group antigens are produced in an individual. What is the importance of CD28 receptor on B cell membrane? Will there be any effect if there is an abnormality in the expression of CD28? Explain in your own words. 3+2+2+1+2=10
4. Explain in your own words the role of adjuvants in increasing the response during vaccination. What is the use of monoclonal antibodies in home pregnancy test kit and are produced against which hapten? How maternal antibodies give protection to the fetus? What were the experiments performed to find out the arms of an antibody? Explain it in your own language. What was the use of homogenous antibodies in antibody sequencing? According to you which class of MHC is important activate immune response? Justify your answer. 2+1+1+2+2+2=10
5. Explain the structure of MHC I molecules with a neat diagram. What are the chances of transplantation between outbred population? Explain your answer in relation to polymorphism of MHC genes. Differentiate between affinity and avidity. What are the similarities and difference between precipitation reaction done in fluids and in gel? Explain the method of rocket electrophoresis. Interpret the precipitation curve with a diagram. 3+2+1+2+2=10

6. What is the importance of C5 convertase during an immune response? Explain the mechanism that follows. Explain the mechanism of endocytic method of antigen processing and presentation. What is the relation between immune clearance and type III hypersensitivity? Explain in your own words. Write about the tests that will confirm histocompatibility or histoincompability between tissues of the donor and the recipient. 3+2+2+3=10
7. What are vaccines? Why is it important to take attenuated strains for recombinant vaccine? Between attenuated and inactivated vaccine, which one is has more advantage? Explain in your own words. What is the importance of dendritic cells expressing antigenic proteins? Justify your answer. How will you interpret the results of competitive ELISA? A patient was infected with Streptococcus. How will you determine the amount of the bacteria in solution? Explain the process. 1+1+2+2+2+2=10
8. What is the outcome of a mother who is Rh positive and the fetus is Rh negative? In your own words explain with reasons how to prevent such complications. Is there any relation between hypersensitivity and autoimmunity? Explain with the help of examples. Is there any relation between atopy and rhinitis? Justify your answer. Explain why an individual with myasthenia gravis suffers from paralysis. What is the importance of  $Ca^{2+}$  ions in degranulation of basophils and mast cells? 3+2+2+2+1=10

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