

**B.Sc. MICROBIOLOGY  
FIFTH SEMESTER  
IMMUNOLOGY  
BMB-502**

**SET  
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

**(Objective)**

Marks: 20

*Choose the correct answer from the following:*

*1×20=20*

- The concept of vaccination was developed by:
  - Louis Pasteur
  - Edward Jenner
  - Carl Landsteiner
  - All of them
- Which of the following statements are TRUE regarding adaptive immunity?
  - Prior exposure to antigen is essential
  - Prior exposure to antigen is not essential
  - It is a non-specific defence mechanism
  - Macrophages are the major cells involved
- NK cell surface receptors partly recognize:
  - Antibody
  - MHC
  - Fc Receptor
  - Both (b) and (c)
- Non-phagocytic cells include which of the following?
  - Follicular dendritic cell
  - Mast cells
  - Basophils
  - Both (b) and (c)
- Germinal center is present within:
  - Primary follicles
  - Secondary follicles
  - Lymph nodes
  - Payer's patch
- Which of the following statement is true?
  - All immunogens are antigens but all antigens are not immunogen
  - All immunogen are antigen and all antigen are immunogen
  - All immunogens are not antigens and all antigens are immunogens
  - None of the above
- $\alpha 3/\beta 2$  domains peptide binding clefts of class II MHC is present on the platform of:
  - $\alpha 1/\beta 1$  domain
  - $\alpha 3/\beta 2$  domain
  - $\alpha 2/\beta 2$  domain
  - None of the above
- Examples of precipitation reaction include:
  - Streptococcal infection
  - SRID
  - Hemagglutination
  - Blood typing
- Class II MHC molecules are presents on the surface of cells EXCEPT:
  - Macrophages
  - Neutrophils
  - Interdigitating dendritic cells
  - B cells

10. Antigenic determinants found in the V region of an antibody molecule is called:
  - a. Isotype
  - b. Allotype
  - c. Idiotype
  - d. All of the above
11. Which of the following is the example of type III hypersensitive reaction?
  - a. Meningitis
  - b. Vasculitis
  - c. Rheumatoid arthritis and Arthus reaction
  - d. All of the above
12. A child stung by a bee experiences respiratory distress within minutes and lapses into unconsciousness. This reaction is probably mediated by:
  - a. IgG antibody
  - b. IgE antibody
  - c. Sensitized T cells
  - d. None of the above
13. Grave's disease is also called as and is caused due to:
  - a. Hypothyroidism, T cells
  - b. Hyperthyroidism, autoantibodies
  - c. Goiter, macrophages
  - d. All on the above
14. Blood group incompatibility reaction is initiated by:
  - a. IgG of the recipient
  - b. IgM of the recipient
  - c. IgG and IgM of the donor
  - d. None of the above
15. During amplification step, there is an increase in the number of:
  - a. C5 convertase
  - b. C3b
  - c. MAC
  - d. Both (a) and (b)
16. The technique where antiserum is added in the molten agarose is:
  - a. Single radial immunodiffusion
  - b. Rocket electrophoresis
  - c. Both (a) and (b)
  - d. Ouchterlony double diffusion
17. Difference between ELISA and RIA is:
  - a. Radioactive elements are used in both
  - b. No radioactive elements are used
  - c. Enzyme is used in ELISA and radioactive elements in RIA
  - d. Enzyme is used in both
18. Complete secondary rejection of an allograft occurs in:
  - a. 1-5 days
  - b. 12-14 days
  - c. 7-10 days
  - d. 5-6 days
19. Mixed lymphocyte reaction for HLA typing is used for:
  - a. Compatibility of class I MHC molecules between donor and recipient
  - b. Compatibility of blood groups between donor and recipient
  - c. Compatibility of WBC between donor and recipient
  - d. Compatibility of class II MHC molecules between donor and recipient
20. Transplantation of isografts leads to:
  - a. Rejection of the transplanted organ
  - b. Transplanted organ is accepted by the recipient
  - c. It is accepted at first and then rejected
  - d. None of the above

( Descriptive )

Time : 2 hr. 30 mins.

Marks : 50

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

1. Why the term "attenuation" was given? Do you think both innate and adaptive immunity work together during an antigenic challenge? Justify your answer. Explain the attributes of adaptive immunity. How immunity is transferred through serum? 2+2+4+2=10
2. How will you differentiate primary and secondary lymphoid organs? Explain with the help of a diagram the structure and function of lymph node. Explain how natural killer cells recognize and kills a potential target cell. An individual is complaining about continuous sneezing and coughing. What types of immune cells do you think is involved in such reaction? Explain the mechanism. 1+4+2+3=10
3. "Antigens which are immunogenic are also antigenic but reverse is not true" expand this sentence and justify your answer. How will you raise antibodies against allotypic determinants of antibodies? What are the findings of heavy chain sequencing? Explain with the help of an example how to increase the efficacy of an antigen. Is there any relation of this method with vaccines? Justify your answer. What is the relation of haplotypes with MHC genes? 2+1+2+2+1+2=10
4. Explain the structure of antibodies with the help of IgM. An individual was transfused for the first time with blood A when his blood type was B leading to its immediate rejection. Explain why this immediate response occurred. How will you interpret the result of RIA? What is the mechanism of cytokine action? Give possible mechanism to downregulate the activity of a cytokine. What is the importance of haptens in today's time? 2+2+2+1+1+2=10
5. An Rh negative woman is carrying an Rh positive baby for the second time. Explain the ensuing immune response in this medical condition and also suggest measures to minimize the damage. Explain the method of complement activation in presence of antigen-antibody complexes. What will be the consequence if C3b is not produced in large amounts? Justify your answer. Explain how immune complex clearance is related with SLE. 2+2+2+2+2=10
6. Define DTH response. Can you site differences between hypersensitivity and autoimmune reactions? Is there any relation between type III hypersensitivity and rheumatoid arthritis? Justify your answer with reasons. What is the importance of  $Ca^{2+}$  ions in degranulation of basophils and mast cells? Explain the whole process of degranulation and its significance in type I hypersensitivity. Explain autoimmune hemolytic anemia. 1+2+2+1+2+2=10

7. What is the principle of immunodiffusion in the detection of antigen or antibody? Explain the principle and process of rocket immunoelectrophoresis. Define grafts. Why in some cases grafts are rejected by the immune system of the recipient. Give reasons. List the tests that are done before transplantation. Write in brief the steps involved.

2+2+1+2+3=10

8. According to you what will be the negative outcome of immunosuppressive drugs? What are the types of grafts? An individual started rejecting the kidney that was transplanted. What is the possible reason and what precautions should be taken before the transplantation? Explain the difference between indirect ELISA and Sandwich ELISA.

2+2+3+3=10

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