



Name :
Roll No. :
Invigilator's Signature :

CS/B. SC(H)(BT/GE/MICRO/MOL)/SEM-3/POI-302/2011-12

2011

PRINCIPLES OF IMMUNOLOGY

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP - A

(Multiple Choice Type Questions)

Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

1. i) Which of the following antibodies would most likely be found in body secretions such as tears, milk, saliva and mucous ?
 - a) IgA
 - b) IgM
 - c) IgE
 - d) IgD.

- ii) For antigen presentation to CD4 + T lymphocytes :
 - a) Antigen is processed via the endogenous pathway
 - b) Specialised antigen presenting cells are required for the induction of the T cell immune response
 - c) Short antigen-derived peptides associate with MHC class II molecules in the endoplasmic reticulum.



- iii) Opsonization :
 - a) is mediated by complement component
 - b) enhance phagocytosis
 - c) is not restricted by MHC
 - d) all of these.
- iv) IgM has
 - a) Five antigen binding sites
 - b) The ability to cross the placenta
 - c) The ability to be attached to mast cells and basophils
 - d) Five constant regions.
- v) B cell that produces and releases large amount of antibody are called
 - a) Memory cell
 - b) Basophil
 - c) Plasma cell
 - d) Neutrophil.
- vi) The reaction of soluble antigen with antibody is known as
 - a) Agglutination
 - b) Precipitation
 - c) Flocculation
 - d) Complement fixation.
- vii) Which of the following is true about Prozone phenomenon ?
 - a) This is due to inappropriate Ag and Ab levels
 - b) There is no relation between Ag and Ab level
 - c) None of these.
- viii) Hapten
 - a) Produces humoral response
 - b) Binds to carrier to produce its effect
 - c) Is high molecular weight proteins
 - d) Is the same as epitopes.
- ix) The function of adjuvant in a vaccine is
 - a) Distribution
 - b) Absorption
 - c) Antigenicity
 - d) Metabolism.



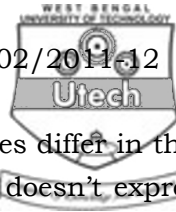
- x) Monoclonal antibodies are used in
 - a) Immunotherapy
 - b) Immunological identification of cells and tissues
 - c) radioimmuno imaging
 - d) all of these.
- xi) Cytokines
 - a) are polypeptides
 - b) act on surface receptors
 - c) take part in intrinsic enzymatic reaction
 - d) are chemotactic.
- xii) Coomb's test is
 - a) Antiglobulin test
 - b) Complement fixation test
 - c) Agglutination test
 - d) Neutralisation test.
- xiii) Chagas disease is caused by
 - a) Protozoa
 - b) Virus
 - c) Bacteria
 - d) Fungus.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- 2. Draw the diagram of AIDS virus. Why mosquitoes cannot transmit AIDS ? Name one test you would perform to detect AIDS. $2 + 2 + 1$
- 3. Write a short note on Allelic Exclusion on individual B cell.
- 4. How could 2.5×10^4 genes encode 2.5×10^7 different TCRs and the same number of different BCRs ?
- 5. a) Where are class II MHC molecules found ?
b) What is the structure of a class I MHC molecule ? $2 + 3$



6. How do naïve B cell and effector T lymphocytes differ in their patterns of migration ? If a murine cell that doesn't express the human CD4 is successfully transfected with the human CD4 DNA will it make it susceptible to HIV infection ? Why, ?

2 + 3

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Write down the principle of ELISA. What is Avidity ? 2 + 2
b) Explain the term identity, non-identity and partial identity with respect to double diffusion method 6
c) What are the forces involved in Antigen antibody reaction ? 5
8. a) What is innate immunity ? Write briefly about the Antigen processing and presentation. 2 + 5
b) Write down the production of monoclonal antibody. 4
c) Write down the differences between Endocytic pathways and Exogenous pathways. 4
9. a) What is Allograft ?
b) Explain mechanism of autoimmunity.
c) Name two autoimmune diseases and their autoantibodies. 4 + 7 + 4
10. a) Mention the cells involved in immune response.
b) Describe the development, identification and functions of different types of lymphocytes. 7 + 8
11. a) Write down the preparation and storage of vaccine ?
b) Explain different types of vaccine with examples.
c) Discuss the usefulness of conjugate vaccine over polysaccharide vaccine. 5 + 7 + 3