## CS/B.TECH (BT)/SEM-5/BT-501/2009-10
## 2009
## 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 )

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

$10 \times 1 = 10$
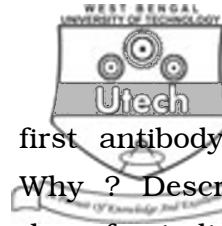
   i) An opsonin is

      a) a chemotactic factor

      b) a chemokine

      c) a substance that enhances phagocytosis

      d) a lysosomal enzyme.

   ii) A receptor that binds antibody to a cell surface is called

      a) Fc receptor       b) complement receptor

      c) CD molecule       d) selectin.

55018                                     [ Turn over

iii) The thymus is

a) a primary lymphoid organ

b) a secondary lymphoid organ

c) a reticuloendothelial organ

d) a lymphoreticular organ.

iv) Helper *T* cells are distinguished by having which marker ?

a) CD2       b) CD3

c) CD4       d) IL-2 receptor.

v) The foetus can be considered

a) allograft       b) xenograft

c) heterograft       d) isograft.

vi) The elimination of self-reactive *T* cells from the thymus is called

a) negative selection       b) positive selection

c) clonal selection       d) apoptosis.

vii) $\beta$2-Microglobulin is an integral part of

a) IgM       b) MHC Class I

c) MHC Class II       d) *T* cell receptor.

viii) The major force linking antigen to antibody is

a) Hydrogen bonds       b) Covalent bonds

c) Hydrophobic bonds       d) Ionic bonds.

ix) Maximum precipitation occurs in Ag-Ab reaction in

a) equivalence zone       b) before eqivalence zone

c) after equivalence zone       d) both (b) and (c).

x) Bivalent fragments of 'Ab' are formed by the proteolytic enzyme

a) Trypsin       b) Papain

c) Pepsin       d) both (b) and (c).

xi) The number of epitopes in antigen is

    a) one                b) two

    c) three              d) four.

xii) Antigen and antibody are linked by co-valent bonds.

    a) True              b) False

    c) In some coses true   d) None of these.

## GROUP – B

### ( Short Answer Type Questions )

Answer any *three* questions of the following. 3 × 5 = 15

2. How can you determine the number of possible antigenic epitopes ?

3. What is serum sickness ? How is it caused ?

4. What are toxoids ? How are used in vaccination ?

5. How do corticosteroids help in managing transplantation problems ?

6. What are the factors responsible for autoimmunity ?

## GROUP – C

### ( Long Answer Type Questions )

Answer any *three* of the following.     3 × 15 = 45

7. What are sequestered antigens ? Give examples. How can they cause autoimmune disorders ? How do steroids alleviate hypersensitivity reactions ? Why is complete Freund's adjuvant not administered in human ?

                                1 + 1 + 5 + 5 + 3

8. Can you use polyclonal antibody as the first antibody in ELISA or Immunofluorescence studies ? Why ? Describe with the help of a neat flowchart the procedure for indirect immunofluorescence. What are attenuated vaccines ? Give two examples of attenuated vaccine.  $1 + 3 + 6 + 3 + 2$

9. Can the foetus be regarded as a graft ? Why ? What is erythroblastosis fetalis ? How is it caused ? What are the present therapies for the problem ?  $2 + 3 + 2 + 4 + 4$

10. What is clonal selection ? What are memory cells ? How are they produced ? If you treat a sample of polyclonal antibody with (i) pepsin and (ii) papain and run a polyacrylamide gel electrophoresis on the treated samples, what bonding patterns would you expect ?  $4 + 3 + 3 + 2\frac{1}{2} + 2\frac{1}{2}$

11. What are the advantages and disadvantages of monoclonal antibodies ? A person develops skin disorders after wearing a metal ring. How could the problem originate ? State the therapeutic and diagnostic uses of monoclonal antibodies.

$$2 \times 2\frac{1}{2} + 4 + 6$$

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