Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH/BT(O)/SEM-5/BT-501/2012-13

2012

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) The predominant type of leucocyte in the blood is
      a) monocyte b) eosinophil
      c) basophil d) neutrophil.

   ii) B2 microglobulin is an integral part of
      a) IgM b) MHC class II
      c) MHC class I d) TCR.

   iii) The form of microphage lining the sinuses of the liver is the
      a) Histiocyte b) Kupffer cell
      c) Monocyte d) Astrocyte.

   iv) The CD4 molecule is a
      a) heterodimer
      b) receptor for class II MHC
      c) part of BCR
      d) complement receptor.

v) Molecules in the *Ig* superfamily share

a) Ag-binding sites b) domains

c) variable regions d) peptide residues.

vi) A hybridoma is a cell formed by the fusion of

a) *T* cell with a myeloma cell

b) macrophage with a myeloma cell

c) *T* cell with a *B* cell

d) plasma cell with a myeloma cell.

vii) The major clinical problem associated with bone marrow transplants is

a) contact dermatitis

b) allograft rejection

c) graft arteriosclerosis

d) graft-versus-host disease.

viii) A suitable organism for use in recombinant vaccines is

a) influenza virus b) smallpox virus

c) poliomyelitis virus d) vaccinia virus.

ix) A molecule for encountering viral infection is

a) Macrophage b) Kupffer cells

c) Interferons d) Chemokines.

x) Complement is a protein present in

a) brain b) liver

c) serum d) kidney.

xi) Antiglobulins are

a) incomplete antibodies

b) antibodies against immunoglobulins

c) complement-fixing antibodies

d) agglutinating antibodies.

xii) The use of a leg vein to repair a damaged coronary artery in a bypass operation is example of

a) Allograft b) Xenograft

c) Heterograft d) Autograft.

GROUP – B

(Short Answer Type Questions)

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

2. Explain the molecular diversity of antibody heavy chains by somatic recombination.
3. Differentiate between helper *T* cells and cytotoxic *T* cells.
4. What is clonal energy ? What are anaphylatoxins ? 2 + 3
5. What is Hinge region in antibody structure ? Which amino acid is present in large number at this region ? What is the role of this amino acid ? 2 + 1 + 2
6. Give an example of immunotherapy of cancer. 2½ + 2½

GROUP – C

(Long Answer Type Questions)

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

7. a) What do you mean by Memory cells ?
   b) Explain with diagram the process of Thymic Education.
   c) Discuss the rationale behind the use of HAT medium in hybridoma technology.
   d) Discuss the mode of action of Natural Killer cells.

   2 + 5 + 5 + 3

8. a) Distinguish between the structural features of MHC-I and MHC-2.
   b) Explain the endocytic pathway of antigen processing and presentation.
   c) Discuss the role of recombination signal sequences in V-D-J joining during somatic hypermutation.
   d) What do you mean by Immunogen and Hapten ?

   3 + 4 + 4 + (2 + 2)

9. Write short notes on any *three* of the following : 3 × 5
   a) Radio immunoassay
   b) DNA vaccine
   c) Antibody affinity and antibody avidity
   d) Class switching
   e) Immediate hypersensitivity.

10. a) Define the following :
   Isograph, Allograft, Xenograft, Autograft.
   b) Discuss the role of helper *T* cells in graft rejection.
   c) Discuss briefly the principle of HLA typing.
   d) Write short account on Graft Versus Host Disease (GVDH). (4 × 1) + 5 + 2 + 4

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