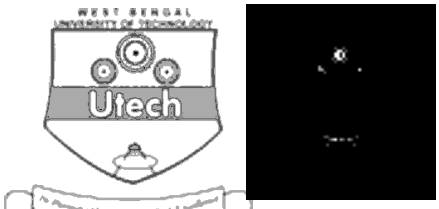
CS/M.Tech(BT)/SEM-2/MBT-202/09
IMMUNOTECHNOLOGY (SEMESTER - 2)



1. ..... *Signature of Invigilator*

2. ..... *Signature of the Officer-in-Charge*

Reg. No.

Roll No. of the Candidate

CS/M.Tech(BT)/SEM-2/MBT-202/09

ENGINEERING & MANAGEMENT EXAMINATIONS, JULY – 2009

IMMUNOTECHNOLOGY (SEMESTER - 2)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. You have to answer the questions in the space provided marked 'Answer Sheet'. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

Question Number											***Total Marks***	***Examiner's Signature***
Marks Obtained												

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Head-Examiner/Co-Ordinator/Scrutineer

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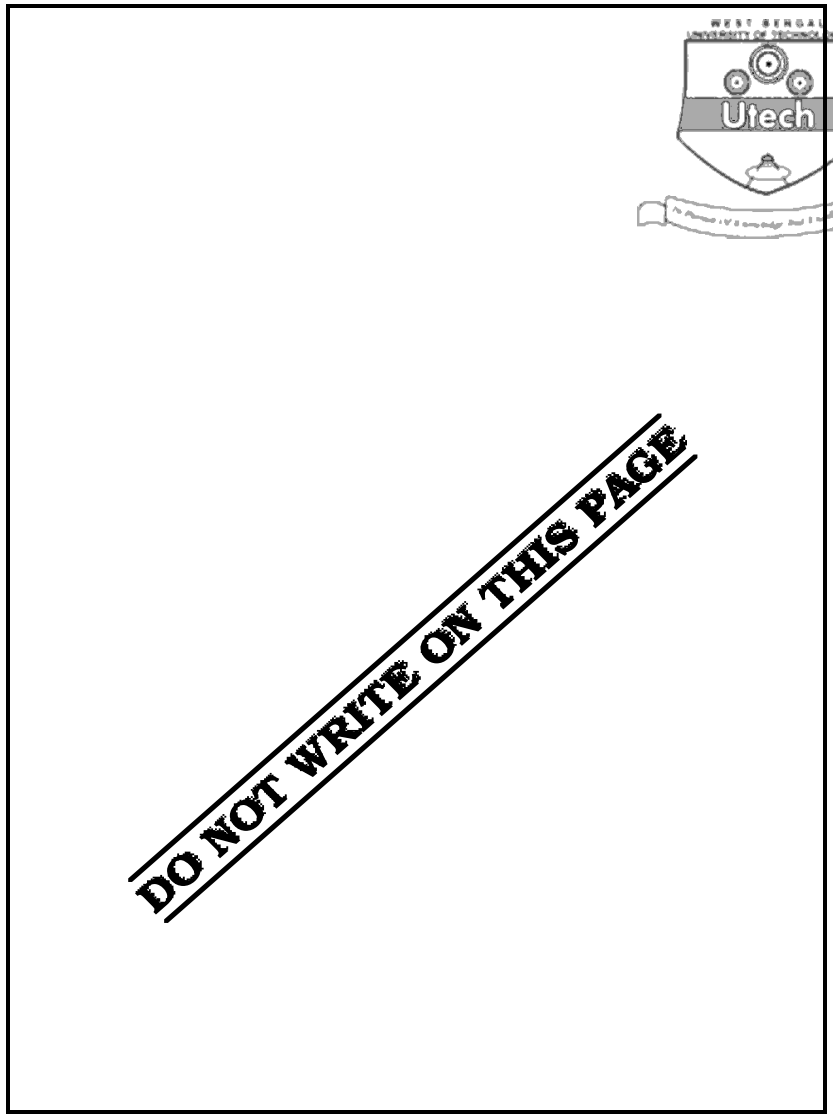
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CS/M.Tech(BT)/SEM-2/MBT-202/09

IMMUNOTECHNOLOGY

SEMESTER - 2

Time : 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.

Answer Question No. 1 and any *six* from the rest. 7 × 10 = 70

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) Which category of hypersensitivity best describes hemolytic disease of the newborn caused by Rh incompatibility ?

a) Atopic or anaphylactic b) Cytotoxic

c) Immune complex d) Delayed.

ii) A woman had a high fever, hypotension and a diffuse macular rash. When all cultures showed no bacterial growth, a diagnosis of toxic shock syndrome was made. Regarding the mechanism by which the toxin causes this disease, which one of the following is LEAST accurate ?

a) The toxin is not processed within the macrophage.

b) The toxin binds to both the class II MHC protein and the *T* cell receptor.

c) The toxin activates many CD4-positive *T* cells and large amounts of interleukins are released.

d) The toxin has an *A-B* sub-unit structure–the *B* sub-unit binds to a receptor, and the *A* sub-unit enters the cells and activates them.

iii) Which one of the following substances is NOT released by activated helper *T* cells ?

a) Interleukin-1 b) Gamma interferon

c) Interleukin-2 d) Interleukin-4.

iv) A child disturbs a wasp nest, is stung repeatedly and goes into shock within minutes, manifesting respiratory failure and vascular collapse. This is MOST likely to be due to

a) systemic anaphylaxis b) serum sickness

c) an Arthus reaction d) cytotoxic hypersensitivity.

v) A patient with severe asthma gets no relief from antihistamines. The symptoms are MOST likely to be caused by

a) interleukin-2

b) slow-reacting substance *A* (interleukin)

c) serotonin

d) bradykinin.

vi) After binding to its specific antigen, a *B*-lymphocyte may switch its

a) immunoglobulin light-chain isotype

b) immunoglobulin heavy-chain class

c) variable region of the immunoglobulin heavy chain

d) constant region of the immunoglobulin light chain.

vii) The principal difference between cytotoxic (type II) and immune complex (type III) hypersensitivity is

a) the class (isotype) of antibody

b) the site where antigen-antibody complexes are formed

c) the participation of complement

d) the participation of *T* cells.

viii) Grafts between genetically identical individuals (*i.e.* identical twins)

a) are rejected slowly as a result of minor histocompatibility antigens

b) are subject to hyperacute rejection

c) are not rejected, even without immunosuppression

d) are not rejected if a kidney is grafted, but skin grafts are rejected.

ix) Natural killer cells are

a) *B* cells that can kill without complement

b) cytotoxic *T* cells

c) increased by immunization

d) able to kill virus-infected cells without prior sensitization.

x) Penicillin is a hapten in both humans and mice. To explore the hapten-carrier relationship, a mouse was injected with penicillin covalently bound to bovine serum albumin and at the same time with egg albumin to which no penicillin was bound. Of the following, which one will induce a secondary response to penicillin when injected into the mouse 1 month later ?

a) Penicillin b) Penicillin bound to egg albumin

c) Egg albumin d) Bovine serum albumin.

2. What do you mean by professional APC ? How does dendritic cell present antigen ? Why is MHC important ? What do you mean by haplotype inheritance ? What is multiple allele ? What is third line of defence ? What is paratope ?

1 + 3 + 2 + 1 + 1 + 1 + 1

3. What are the factors of antigenicity of an antigen ? Which one is better — active immunity or passive immunity ? What do you mean by cell mediated immunity ? What are the functions of adjuvant ? What is idiotype ? What are NSAID and DMARD ? Give some example. What is the structure of TCR ? 2 + 1 + 1 + 1 + 1 + 2 + 1 + 1

4. What are the differences between adaptive immunity and innate immunity ? What is the molecular mechanism of gene joining in antibody gene rearrangement ? What is the function of killer cell ? What are the different factors of autoimmunity ? What is clonal energy ? 2 + 3 + 1 + 2 + 2

5. How attenuated vaccine results both humoral and cell mediated immunities but heat killed vaccine only humoral ? What is the molecular mechanism of rheumatoid arthritis ? Write on JAK-STAT pathway. 2 + 5 + 3

6. Compare between alternative and classical pathways of complement activation. What is the difference between agglutination and precipitation reactions ? What do you mean by immune tolerance ? What is its importance ? Give an example of active humoral immunity. 3 + 2 + 2 + 2 + 1

7. What are thymus dependent and thymus independent antigens ? What is SCID ? How is HBSAg produced ? What do you mean by pagocyte ? How does asthma occur ?

2 + 1 + 3 + 1 + 3

8. How do *B* cells and *T* cells learn immune tolerance ? How is humanized antibody produced ? What is HDNB ? What are the functions of hinge region and *Fc* region of an antibody ? 3 + 3 + 2 + 2

9. How are *T* cells matured ? What is the importance of complement system ? How do you explain the phenomenon of huge type of antibody but relatively less type of complement ? Why are our own cells not attacked by complement ? How do you explain the codominant expression of IgG and IgD ? 3 + 2 + 2 + 1 + 2

END