Model Answer LBTM 302 : IMMUNOLOGY
M.Sc. (III semester) Biotechnology Examination 2014-2015

Section A.

1. Answer following questions in one word or sentence.

(i). Name the organ where T cells mature/differentiate? **Thymus**

(ii). What is alternative name for epitopes? **Antigenic Determinants**

(iii). Which of the antibodies contain J chain? **IgM and IgA**

(iv). What is full form of ELISA? **Enzyme-linked Immunosorbent Assay**

(v). Which MHC molecules contain β_2-microglobulin? **MHC I**

(vi). Among Th1 and Th2 type, IFN is representative cytokine of which type? **Th1**

(vii). What are lymphokines? **Cytokines secreted by lymphocytes**

(viii). CD4 are expressed on which cells? **Th cells**

(ix). Positive and negative selection of T cells occurs in which lymphoid organ? **Thymus**

(x). What is alternative name for Type II hypersensitivity? **Antibody-mediated hypersensitivity**

Section B:

2. How cells of immune system generated? Write a flow diagram for hematopoiesis. Discuss differences between B lymphocyte and T Lymphocytes.

   Hematopoiesis: Labeled diagram with short description of steps in hematopoiesis is must. Differences between B and t lymphocytes in terms cell surface markers, cellular constitution, role in immunity (Ab production, cytotoxicity, Antigen presentation, cytokine production profile, cognate non-cognate interaction) are required.

3. Discuss role of immune system in transplantation. How tissues are judged for successful transplantation?

   Discussion about role of T cells, and MHC I and II molecules along with cytotoxic rejection of graft is required. Tissues judgment ffor transplantation by MHC I and II MiHC, RBC matching must discussed step wise with possible results.

4. With appropriate diagram, describe antigen presentation and interaction of MHC-antigenic peptide complex-TCR.

   Elaborative Diagram accompanying presentation of Ag on MHC and interaction in terms of affinity (enhanced by adhesion molecules), recognition (MHCI and II by CD8 and CD4 respectively) must be discussed.

5. How effector T cells are generated? What are different requirement of T helper and T cytotoxic cells?

   Generation of effector T cells after interaction with appropriate Ag presented on MHC molecule(s) must be discussed. Difference in requirement of T helper and T cytotoxic cells in terms of MHC type, Ag type, Target cell type and especially for activation of naïve and memory or cytotoxic cells is required.

6. What are MHC molecules? Draw labeled diagram of class I and II MHC molecule and endogenous pathway of antigen processing and presentation.

   Major Histocompatibility complex: Labeled diagram for MHC I and II along with diagram for processing pathway (Proteosome, TAP, ER, Golgi) and presentation of endogenous Ag on MHC class I molecule is required.

7. Discuss the role of adhesion molecules in lymphocyte trafficking?

   Types of Adhesion molecules and their interaction along with their role in rolling, arrest activation, migration is required.

8. Briefly describe about life cycle and immune responses in AIDS and Malaria.

   Entry if pathogen in host body/cells and subsequent progression in different organ/organelles and release must be discussed along with cells/molecules of immune system involved in recognition, neutralization and elimination. Escape mechanism(s) adopted by HIV and *Plasmodium* must be discussed in brief. Use appropriate diagram.

03.12.2014