Reg. No. : | | | | | | | | | | | |

Q 2312

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Sixth Semester

Industrial Biotechnology

IB 343 — IMMUNOLOGY

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Compare and contrast between innate and acquired immunity.

2. For each of the following situations indicate which type(s) of lymphocytes would be expected to proliferate rapidly in lymphnodes.

   (a) Normal mouse immunized with a soluble antigen

   (b) Neonatally thymectomized mouse immunized with protein antigen.

3. Compare the cytotoxicity mediated by Tc and NK cells.

4. What is the role of idiotypic antibodies in immune regulation?

5. How a particular B cell clone is selected and activated by Ag to produce Ab?

6. What is SCID? Give one example of genetic defects that cause SCID diseases.

7. Explain the type of MHC molecules expressed on RBC. State its significance related to blood transfusion.

8. Explain the role of primary and secondary mediators of hypersensitivity Type I.

9. What is graft versus host disease? In what circumstances does it occ

10. How does the immune system respond to tumor?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Compare the structure and properties of different classes of immunoglobulins.

(ii) Write in brief about gene rearrangement in heavy chain and light chain of immunoglobulin. (8 + 8)

Or

(b) (i) List the important properties of an ideal antigen. What are super antigens? Outline their mode of action with example.

(ii) With a neat diagram explain the structure of a lymph node and outline its functions. (8 + 8)

12. (a) (i) Influenza virus is enveloped virus that infects respiratory epithelial cells; Dendritic cells are also infected and carry the virus to nearby lymphoid tissue. Describe how the virus is processed and presented by these infected dentritic cells and to what cells they present the Ag? What factors influence how efficiently the antigens are presented?

(ii) Discuss the immunological mechanisms of pathogenesis of a tumor. (8 + 8)

Or

(b) (i) Describe classical and alternative pathways of complement activation and its biological consequences. (10)

(ii) Write a note on complement fixation test. (6)

13. (a) (i) Outline the production and applications of monoclonal antibody. (10)

(ii) What are the approaches used to produce humanized monoclonal antibody? (6)

Or

(b) (i) Describe phagocyotosis with relevance to cells involved and mechanism of killing process.

(ii) List the major APC's. Outline their major functions. (8 + 8)

14. (a) (i) Write the mechanism for acute, hyper acute and chronic graft rejection. (10)

(ii) What are the two tests commonly used to assess the compatibility of tissue graft. (6)

Or

(b) (i) Explain the different types of hypersensitivity and their mechanism by which they mediate tissue damage. (12)

(ii) Explain the mode of action of different types of immunosuppressive drugs commonly used. (4)

15. (a) (i) Brief on possible mechanism for development of autoimmunity with an example. (10)

(ii) Monoclonal antibodies have been administered for therapy in various autoimmune animal models. Which monoclonal antibodies have been used and what is the rational for these approaches? (6)

Or

(b) (i) With a neat diagram outline the intracellular events occurring in T cell when Ag binds to TCR which leads to cytokine production. (8)

(ii) Mention any four cytokines. Outline their therapeutic applications. (8)
