A 1286

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 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 the properties of an antigen that allow it to immunologically stimulate B cells versus T cells.

2. Define hapten and adjuvant. Give one example for each.

3. What are opsonins? Outline the process of opsonisation.

4. Give an example for natural and artificial passive immunization.

5. Write any four important B cell surface markers and their function.

6. Outline the steps involved in T cell development and maturation.

7. List out the therapeutic applications of cytokines and cytokine receptors.

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

9. What are immunological privileged tissues and sites. Give two examples.

10. What are three likely sources of tumor antigen?

PART B — (5 × 16 = 80 marks)

11. (a) (i) List the different types of immune cells and immune organs and their role in immune response.

(ii) Compare and contrast between the following with suitable examples :

– Innate and acquired immunity

– Cytotoxicity mediated by Tc and NK cell. (8 + 8)

Or

(b) Outline the complement activation pathways. Write a note on the biological consequences of complement activation. (16)

12. (a) (i) Explain the mechanism responsible for generation of antibody diversity.

(ii) Compare the structure and properties of different classes of immunoglobulins. (8 + 8)

Or

(b) Outline the production and applications of monoclonal antibody. How do you produce humanized monoclonal antibody? (16)

13. (a) (i) Compare and contrast the processing and presentation of exogenous and endogenous antigen.

(ii) Outline the structure and function of MHC I and II molecules (8 + 8)

Or

(b) (i) Outline the mechanism of immune tolerance and immune suppression.

(ii) What are APC's? Outline their role in antigen presentation. (8 + 8)

14. (a) Outlines the Coombs classification of hypersensitivity and explain the mechanism by which they mediate tissue damage. (16)

Or

(b) With a flow chart show how information flows from antigen binding to TCR to the production of cytokines. (16)

15. (a) (i) Describe the mechanism of acute, hyperacute and chronic graft rejection.

(ii) What is the rationale for using immune suppressive drugs following transplantation? Explain the mode of action of any two immunosuppressive drugs (8 + 8)

Or

(b) (i) List and describe four possible mechanisms for development of autoimmunity. Give an example for each.

(ii) How are monoclonal antibodies being used to treat autoimmune diseases? (12 + 4)