

**Five-Year Integrated M. Sc. Examination 2024**

**Semester-VII**

**Paper: LS-4-7-1**

**(Immunology and Immunotechniques)**

**Time: Four Hours**

**Full Marks: 80**

Questions are of values indicated in the margin

(Answer **Question No. 01** and **any four** from the rest)

1. Write short notes on **any ten** of the following: 2x10=20
  - a. Active and passive immunity
  - b. Epitope and paratope
  - c. Common lymphoid progenitor cells (CLPs)
  - d. Antibody- Dependent Cell-mediated Cytotoxicity (ADCC)
  - e. Phagocytosis and opsonization
  - f. Class switching of immunoglobulin molecules
  - g. Complement C3 Convertase
  - h. Monoclonal and polyclonal antibodies
  - i. One example of live attenuated and inactivated vaccines.
  - j. Purpose of using “forward scatter and side scatter” in flowcytometry
  - k. Antibody affinity and avidity
  - l. Principle of “Immunoprecipitation”
2.
  - a. Explain the different stages of B-cell development that occur in bone marrow with suitable diagrammatic representation.
  - b. Describe the B-cell activation with help of TH-cells in secondary lymphoid organ.
  - c. Write a brief note on “clonal selection” theory. 5+7+3
3.
  - a. Describe the pre stage procedure required before selection of antibody producing B-lymphocytes from mice.
  - b. Write the process of preparation of hybridoma cells and their selection for monoclonal antibody production.
    - c. Explain the procedure for production of monoclonal antibodies from hybridoma cells through *in -vivo* and *in-vitro* methods. 4+6+5
4.
  - a. Give an account of complement activation by Classical Pathway. Compare and contrast it with Alternative Properdin-activated Pathway.
    - b. Discuss briefly the concept of “Allelic exclusion” of immunoglobulins. What are the various mechanisms through which antibody diversity occurs? (3+4)+(2+6)
5.
  - a. What is the difference between traditional and recombinant production of vaccines?
  - b. Describe the procedure of production of subunit recombinant hepatitis B vaccines.
  - c. Write a short note on “Third generation” vaccines. 4+6+5
6.
  - a. How does the phagocytic cells destroy pathogenic microorganisms?
  - b. Explain the killing mechanisms of target infected cell by Natural killer (NK) cells.
  - c. Write a note on factors that affects the strength of Ag-Ab interaction(s). 4+7+4
7. Write short notes on
  - a. Sorting of cells by flowcytometry.
  - b. Localization of target gene by Fluorescence *In Situ* Hybridization (FISH).
  - c. Visualization of desired protein by Western-blot analysis. 3x5=15