FIVE YEAR INTEGRATED M.Sc. EXAMINATION 2022
SEMESTER – VII
Paper LS-4–7–1
Immunology and Immunotechniques

Time: Four Hours **Full Marks: 80**

Questions are of value as indicated in the margin

Answer Question **No. 01**

1. Write short notes on ***any ten*** of the following: 2x10=20
   (a) Differences between humoral and cell mediated immunity
   (b) Antigen-presenting cells (APCs)
   (c) Difference between Freund's complete and incomplete adjuvants
   (d) Toll like receptor (TLRs)
   (e) Interferons
   (f) Differences between active and passive immunization
   (g) Define the term "Affinity and Avidity" with respective to Ag-Ab interaction
   (h) Immunoglobulin "Class switching"
   (i) Antibody dependent cell-mediated cytotoxicity (ADCC)
   (j) Complement proteins
   (k) Recombinant vaccines
   (l) MHC molecules

Answer ***any four*** of the following 4X15= 60

2. (a) How does the B-cell maturation occur in bone marrow and peripheral lymphoid organ.
   (b) Describe the role of TH cell in B-cell activation.
   (c) Describe the T cell selection in the thymus.

   (3+3)+5+4

3. (a) Briefly describe immunoglobulin structure and organization of Ig genes.
   (b) Explain the germline gene rearrangement in heavy chain.
   (c) Explain the concept of "allelic exclusion" with respect to immunoglobulin.

   (2+4)+6+3

4. (a) Differentiate between polyclonal and monoclonal antibody. What are the advantages of monoclonal antibodies over polyclonal antibodies? Describe in detail process of monoclonal antibody production by hybridoma technology.
   (b) Write down factors affecting the antigen – antibody reactions.

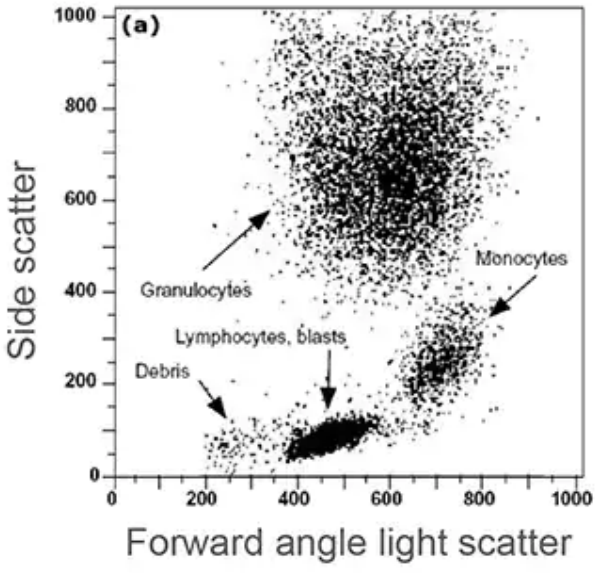
   (2+2+6)+5

5. (a) What is complement system and its function in immune system. Describe any two-complement activation pathway.
   (b) What is phagocytosis? Give a brief outline of various steps involved in it.

   (2+4+4)+5

6. (a) What is the basic principle involved in "Flow cytometry" and how does one can examine the size and complexity of a given cell using flow cytometer?
   (b) Briefly explain the sorting of desired cells from mixture of cell using "droplet technology".

(c) Summarize the figure given below



(2+3)+5+5

7. Write short notes on
   (a) Radioimmunoassay
   (b) Immunoprecipitation
   (c) Fluorescence In Situ Hybridization (FISH)

3 x 5 = 15