Exam. Code : 103203
Subject Code : 1361

B.A./B.Sc. Semester—III

BIOTECHNOLOGY

(Immunology & Animal Tissue Culture)

Time Allowed—3 Hours] [Maximum Marks—75

Note :— Question No. 1 is compulsory. Attempt any **one** question each from the Unit-I to Unit-IV.

1. Give a suitable answer in a few lines for each of the following questions :

   (i) What are T_H cells and their functions ?

   (ii) Who got the Nobel Prize in 1987 for studying the antibody diversity ?

   (iii) What are important functions of NK cells ?

   (iv) Which antibody has highest affinity for *Staphylococcus aureus* Protein–A ?

   (v) What is arithmetic growth ?

   (vi) What is a histotypic culture ?

   (vii) Who developed the concept of trypsinization ?

   (viii) What are important properties of transformed cells ?

   (ix) Which antibiotic(s) is added to the tissue culture medium to avoid the contamination of fungi and mycoplasma ?

   (x) What is a primary lymphoid organ ? 1.5×10=15

UNIT—I

2. (a) What are isotypes ? How they differ from allotypes ? Draw the schematic diagram of an antibody and describe important biological functions of various antibodies. 2,2,6

   (b) Describe the structure and functions of spleen. 5

3. (a) What is acquired immunity ? How it differs from innate immunity ? What role macrophages and immune cells play in the development of long-term immunity in the host ? 2,3,5

   (b) What is Bursa of Fabricus and its functions ? 5

UNIT—II

4. (a) What is MHC complex in human ? Describe the pathway for the processing of an antigen by MHC-II complex with suitable diagrams. 3,7

   (b) What is a TcR ? How it differs from Ig receptor of B cells ? 5

5. (a) What is the difference between an antigen and an immunogen ? Describe the structure and biological functions of an IgM antibody in detail. 3,7

   (b) What is agglutination ? How this method is used to detect an antigen in the serum ? 5

UNIT—III

6. Write short notes on any **two** of the following :

   (i) Serum free media

   (ii) Growth factors

   (iii) Hay flick limit 7.5×2=15

7. What are the major physico-chemical requirements of mammalian cells *in vitro* ? What are advantages of using serum free media for culturing of mammalian cells ? 10,5

UNIT—IV

8. What are major differences between the normal cells and transformed cells ? How specific growth rate of the mammalian cells can be determined ? 7,8

9. (a) What is a primary cell line ? How a fibroblast cell line can be developed from the skin of mouse ? 2,8

   (b) What are transformed cells ? Describe their important properties. 5