IMMUNOLOGY
(BIOT 3201)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) The association constant (K_a) at equilibrium is represented by
(a) [AgAb complex]/[free Ag][free Ab] (b) [AgAb complex]
(c) [free Ag][free Ab]/[AgAb complex] (d) [free Ag]/[free Ab].

(ii) B Cells are activated by
(a) Complement (b) Antibody
(c) Memory cells (d) Antigen

(iii) The membrane attack complex consists of
(a) OH (b) Collicins
(c) C3b3b, Bb (d) C5b,6,7,8,9

(iv) Clonal selection occurs when antigen is encountered by
(a) Neutrophils (b) T cells
(c) Mast cells (d) Basophils

(v) The complementarity determining regions
(a) are restricted to light chains
(b) are in the constant part of the Ig molecule
(c) Bind to Fc receptors
(d) Are concerned in antigen recognition

(vi) Which of the gene clusters do not contribute to antigen binding?
(a) V_L (b) C_L
(c) V_H (d) D

(vii) In primary immune response, antibodies rise in plasma level within
(a) 10 days (b) 12 days
(c) 7 days (d) 15 days

(viii) BCG is used to protect against
(a) Tuberculosis (b) Rabies
(c) Influenza (d) Hepatitis B

(ix) Type IV hypersentivity is often referred to as
(a) Immediate (b) Delayed
(c) Anaphylactic (d) Anergic

(x) The major molecules responsible for transplant rejection is
(a) B cells (b) MHC molecules
(c) T cells (d) Antibodies

Group – B

2. (a) Discuss about the properties of antigens. Distinguish between exogenous, endogenous and auto-antigens.

(b) Discuss about central and peripheral T cell tolerance.

(2 + 4) + 6 = 12

3. (a) Discuss about the different types of acquired immunity.

(b) Discuss about the life-cycle of B-cells and how they can be activated.

6 + 6 = 12

Group – C

4. (a) How does the same antibody exist both in secretory as well as membrane-bound forms?

(b) Explain how a B cell is able to switch between different isotypes.

(c) Discuss how somatic hypermutation plays a major role in antibody diversity.

4 + 4 + 4 = 12

5. (a) Illustrate the structure of a typical antibody molecule.

(b) What do you mean by chimeric immunotoxins?

(c) Give a comparative analysis of indirect, competitive and sandwich ELISA.

4 + 2 + 6 = 12

Group – D

6. (a) Describe the structure of MHC Class II.

(b) Illustrate the mode of antigen processing and presentation for endgenous antigens.

(c) What is tissue typing?

5 + 4 + 3 = 12

7. (a) Give a comparative account of acute, hyperacute and chronic rejection.
   (b) Discuss the polymorphism of the MHC Class-I & II genes.
   (c) What is the advantage of this polymorphism?

5 + 4 + 3 = 12

Group – E

8. (a) Discuss the two-signal hypothesis for T-cell activation.
   (b) How does deposition of immune complexes lead to 'frustrated phagocytes'?
   (c) Write a brief note on immunopathology of SCID.

4 + 4 + 4 = 12

9. (a) What do you mean by active and passive immunization? Give examples.
   (b) Site an example how you can use cytokines for cancer immunotherapy.
   (c) Write a brief note on reverse vaccinology.

4 + 3 + 5 = 12

Department & Section	Submission Link
BT	https://classroom.google.com/c/MzE1ODY1NTA2NzMy/a/MzY1MTM1MTg1MTc4/details