P. P. SAVANI UNIVERSITY

Third Semester of B.Sc. Examination
December-2021
SSBT2070–Immunology I

09.12.2021, Thursday **Time: 09:00 a.m. to 11:30 a.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

Section-I (Total Marks - 30)

Q.1 Short Questions **[10]**

1.1 Objectives **[05]**

1.1a MHC molecules (Class I and Class II) are involved in

- **A** presenting antigens to TLRs
- **B** presenting antigens to B-cell receptors
- **C** presenting antigens to T-cells
- **D** presenting antigens to pattern recognition receptors

1.1b Lymphocytes which have not encountered any antigen yet, are known as

- **A** naive lymphoctes
- **B** baby lymphocytes
- **C** mature lymphocytes
- **D** young lymphocytes

1.1c Lysozyme from our saliva and tears

- **A** are not highly specific against antigens
- **B** shows high degree of specificity against antigens
- **C** target a common feature of pathogen
- **D** both A and C

1.1d Which of the following significantly improved the method of variolation

- **A** Edward Jenner
- **B** Elie Metchnikoff
- **C** Louis Pasteur
- **D** Emil von Behring

1.1e 'Molecules common to frequently encountered antigens' are recognized by the

- **A** receptors of innate immunity
- **B** receptors of adaptive immunity
- **C** both A and B
- **D** none of the above

1.1f Which among following explains antibody diversity

- **A** Instructional Theory
- **B** Selective Theory
- **C** Antibody diversity theory
- **D** Clonal Selection Theory

1.1g Processed antigens are presented to Tc cells by

A Class I MHC
B Class II MHC
C Class III MHC
D Class IV MHC

1.1h Increase in the diameter of the blood vessel is known as
A Vasodilation
B Edema
C Margination
D Diapedesis

1.1i Phogocyte is involved in
A Innate immunity only
B Adaptive immunity only
C Both Innate and Adaptive immunity
D None of the above

1.1j Which of the following is the characteristic of adaptive immune response
A antigen specificity
B antibody diversity
C immunologic memory
D all of the above

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) [05]

1.2a Lysozyme mediates humoral immune response (True/False)

1.2b Plasma therapy is a means of active immunization (True/False)

1.2c Injective attenuated virus in an individual provides passive immunization (True/False)

1.2d T-cell receptors can recognize specific soluble antigen (True/False)

1.2e Innate immunity displays more diverse immune receptors compared to that of adaptive immunity (True/False)

Q.2 Short Notes (Attempt any two) [06]

A Contribution of Edward Jenner

B Interferon

C Receptors of innate and adaptive immunity

Q.3 Explain in detail (Attempt any two) [14]

A Which immunological theory explains antibody diversity? Describe it in detail with a suitable diagram.

B Adaptive immune response

C Innate immune response

Section-II (Total Marks - 30)

Q.1 Short Questions

1.1 Objectives [10]

1.1a Hypervariable region in antibody molecule are located in [05]
A light chains of Fab regions

B heavy chains of Fab regions
C light and heavy chains of Fc regions
D both A and B

1.1b Which of the following substances will not stimulate an immune response unless they are bound to a larger molecule?
A Antigen
B Virus
C Hapten
D Miligen

1.1c IgG is the major antibody in
A serum
B mucosal surface
C serum and mucosal tissues
D serum and nonmucosal tissues

1.1d Which of the following is the hybridoma selection medium?
A RAT
B HAT
C TAT
D MAT

1.1e IgG has .....
A 1 heavy chain and 1 light chain
B 2 heavy chain and 2 light chain
C 2 heavy chain and 4 light chain
D 3 heavy chain and 3 light chain

1.1f Antibodies exists as
A soluble form
B cell-bound receptor
C both A and B
D none of the above

1.1g One heavy chain has ..... hotspots
A 1
B 2
C 3
D 4

1.1h The myeloma cell used for hybridoma technology must be
A Ab negative
B HGPRT negative
C NADPH reductase negative
D both A and B

1.1i HGPRT enzyme is required for
A Salvage pathway
B de novo pathway
C amino acid biosynthesis pathway
D TCA cycle

1.1j Aminopterin blocks the

A de novo pathway of nucleic acid biosynthesis
B salvage pathway of nucleic acid biosynthesis
C gluconeogenesis pathway
D Glycolysis pathway

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) [05]

1.2a Alloantigens are the antigens found in different members of the same species (True/False)

1.2b Hypervariable regions are present in the Fc end (True / False)

1.2c Phosphodiester bond connects the heavy and light chains together (True/False)

1.2d IgG is highly flexible molecule (True/False)

1.2e Typhus fever antigens are example of alloantigens (True / False)

Q.2 Short Notes (Attempt any two) [06]

A Epitopes

B Haptens

C Adjuvants

Q.3 Explain in detail (Attempt any two) [14]

A Factors that influence immunogenicity

B What do you mean by polyclonal and monoclonal antibodies? Explain hybridoma technology in detail.

C Antibody structure (IgG only) and two major roles.