B.TECH/BT/6TH SEM/BIOT 3201/2019

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:

 $10 \times 1 = 10$

- (i) The specificity of an antibody is due to (a) its valence (b) the heavy chains (c) the Fc portion of the molecule (d) the variable portion of the heavy and light chain. (ii) B and T cells are produced by stem cells that are formed in (a) bone marrow (b) the liver (c) spleen (d) lymph nodes. The ability of the immune system to recognize self antigens versus (iii) non-self antigen is an example of (a) specific immunity
 - (b) tolerance (d) humoral immunity.
- A living microbe with reduced virulence that is used for vaccination (iv) is considered (a) dormant (b) virulent (c) attenuated
 - (d) denatured.
- (v) The basic Ig unit is composed of (a) 2 identical heavy and 2 identical light chains

(c) cell mediated immunity

- (b) 2 identical heavy and 2 different light chains
- (c) 2 different heavy and 2 identical light chains
- (d) 2 different heavy and 2 different light chains.

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- (vi) One common enzyme used in ELISA is

 (a) myeloperoxidase
 (b) superoxide dismutase
 (c) horseradish peroxidase
 (d) catalase.
- (vii) HIV binds to (a) CD4 (b) IL-2 receptor (b) NF-KB (d) TNF receptor.
- (viii) SCID can occur due to the absence of an enzyme called______
 (a) adenosine deaminase
 (b) guanosine deaminase
 (c) phosphoryase
 (d) thymidine deaminase.
- (ix) The first recombinant antigen vaccine approved for human use is
 (a) hepatitis B vaccine
 (b) var vaccine
 (c) var vaccine.
- (x) The first production of live but non-virulent forms of chicken cholera bacillus was achieved by
 (a) pasteur
 (b) jenner
 (c) salk
 (d) sabin.

Group - B

- 2. (a) Describe the different steps for the activation of (i) Helper and (ii) Cytotoxic T cells.
 - (b) Describe the main steps behind B cells maturation.
 - (c) Difference between naturally acquired and artificially acquired immunity.
 (3 + 3) + 3 + 3 = 12

3. (a) Describe the mechanism behind cell mediated immunity.

(b) What are the different types of APCs and give an account about their functions.

5 +(2 + 5) = 12

4 + 4 + 4 = 12

Group - C

- 4. (a) Illustrate the role of RSS in V-D-J recombination.
 - (b) How does DNA break and join during Ig gene recombination?
 - (c) 'The junctional diversity is enhanced by addition of P-nucleotides and N-nucleotides' justify the statement.

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- 5. (a) Discuss the principle of monoclonal antibody production by HAT medium.
 - (b) What do you mean by humanized antibodies?
 - (c) Discuss the principle of Ouchterlony double immunodiffusion technique.

5 + 3 + 4 = 12

Group - D

- 6. (a) Give a comparative analysis of the structure and function of MHC Class-I and Class-II molecules with figures.
 - (b) Illustrate the mode of antigen processing and presentation for exogenous antigens.
 - (c) What is tissue typing?

5 + 4 + 3 = 12

- 7. (a) What do you mean Graft versus host disease?
 - (b) Discuss the role of Helper T cells in transplant rejection.
 - (c) What is meant by cross-reactivity of antigens?

5 + 4 + 3 = 12

Group - E

- 8. (a) Discuss the process of immune regulation by anti-idiotype antibodies.
 - (b) Explain the terms briefly: Atopy, Anaphylaxis.
 - (c) Write a brief note on immunopathology of Myasthania gravis. 4 + (2 + 2) + 4 = 12
- 9. (a) What do you mean by clonal anergy?
 - (b) Describe the pathways leading to peripheral tolerance.
 - (c) Illustrate the mechanism of Type-I hypersensitivity.

2 + 5 + 5 = 12

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