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## BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – B.Sc.(BT)-Hons-2022

Course Name – Immunology

Course Code - BBTC603

( Semester VI )

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Report the major constituents of cytotoxic T-lymphocyte
  - a) Lysozyme
  - b) Lymph
  - c) Protein
  - d) Perforin and granzyme
- (ii) Indicate the following types of cell produce IgE
  - a) Mast cells
  - b) Eosinophils
  - c) Plasma cells
  - d) T lymphocytes
- (iii) Predict chemically an antigen may be
  - a) lipid
  - b) protein
  - c) polysaccharide
  - d) any of these
- (iv) What is the process of converting proteins into MHC-associated peptide fragments called?
  - a) Antigen recognition
  - b) Antigen processing and presentation
  - c) Antigen elimination
  - d) Antibody-mediated response
- (v) Select the cell belongs to myeloid lineage which function as Antigen Presenting Cells
  - a) B-cell
  - b) Macrophage
  - c) Dendritic cell
  - d) T-cell
- (vi) Choose which molecule enhances the process of phagocytosis by binding to both antigen and macrophage.
  - a) TLRs
  - b) Antibody (opsonin)
  - c) Cytokines
  - d) MHC molecules
- (vii) Examine the correct statement regarding vaccination
  - a) vaccination is a method of active immunisation
  - b) vaccination is a method of passive immunisation
  - c) vaccination is a method of artificial passive immunisation
  - d) vaccination is a method of natural passive immunization

- (viii) Select the approach (s), that is/are currently followed to produce human monoclonal antibodies, is/are known as
- transformation of antigen specific B lymphocytes (EBV)
  - hybridization of 6-thioguanine-resistant human plasmacytoma with immune human lymphocytes
  - combination of EBV and hybridoma techniques
  - all of these
- (ix) Determine the Southern blotting technique depends on
- similarities between the sequences of probe DNA and experimental DNA
  - similarities between the sequences of probe RNA and experimental RNA
  - similarities between the sequences of probe protein and experimental protein
  - the molecular mass of proteins
- (x) Interpret, IgA and IgG antibodies provide the following kinds of immunity to the infant or foetus
- Natural Active Immunity
  - Natural Passive immunity
  - Artificial Active Immunity
  - Artificial passive immunity
- (xi) Select that the sensitisation of allergen refers to
- When an allergen leaves the body
  - The first contact of an allergen
  - The incubation period of an allergen
  - When symptoms of the disease appear
- (xii) Indicate, the low affinity Fc gamma RII IgG receptor:
- Binds aggregated IgG.
  - Binds monomeric IgE.
  - Is not present on macrophages.
  - Has a GPI anchor.
- (xiii) Examine, for vaccination against mycobacterial diseases such as tuberculosis, the most important facet of the immune response to be stimulated is:
- Cytotoxic T-cells
  - A high titer of antibody
  - Neutrophils
  - Macrophage-activating cell-mediated immunity
- (xiv) Interpret that a peptide immunogen:
- Adopts a single rigid structure in solution
  - Can elicit potent antibody responses in the absence of T-cell help
  - Can be used to stimulate B-cell but not T-cell responses
  - Can mimic a part of a discontinuous epitope
- (xv) Identify that T cells serve as a source of \_?
- Interleukin
  - Interferon
  - Lymphotoxin
  - All of these

#### Group-B

(Short Answer Type Questions)

3 x 5=15

(Answer any Five from the following)

- Explain why approximately 90% of C4b is hydrolyzed before it can bind the cell surface (3)
- "There are two C3 convertases in the alternative pathway". What would you conclude from this statement? (3)
- Illustrate with a diagram the structure of T-Cell Receptor Complex- TCR-CD3. (3)
- Summarize the role of NK cells in the immune system (3)
- Justify "Why is the affinity of the T-cell receptor (TCR) for peptide-MHC complexes weaker compared to antibody-antigen binding, and how do cell-adhesion molecules contribute to effective T-cell interactions?" (3)

OR

Evaluate the consequence of deletion of CD40 ligand gene from TH cells on the humoral response to thymus dependent antigens. (3)

#### Group-C

