



BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – M.Sc.(BT)-2022/M.Sc.(BT)-2023
Course Name – Immunology
Course Code - MBTC201
(Semester II)

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) Select which among the following is not a character of adaptive immunity.
- | | |
|-----------------------|-------------------------------------------|
| a) Specificity | b) Memory |
| c) Present from birth | d) Involves antigen-antibody interactions |
- (ii) Identify that T cells serve as a source of _?
- | | |
|----------------|-----------------|
| a) Interleukin | b) Interferon |
| c) Lymphotoxin | d) All of these |
- (iii) Interpret which of the following types of cell produce IgE ?
- | | |
|-----------------|------------------|
| a) Mast cells | b) Eosinophils |
| c) Plasma cells | d) T lymphocytes |
- (iv) Infer that Toll like receptor (TLR) fall in which category of biomolecules?
- | | |
|------------------------|----------------------------|
| a) Immuno activator | b) Immuno sensor |
| c) produce memory cell | d) It is hormonal receptor |
- (v) Identify which one of the following is not a phagocyte?
- | | |
|----------------|----------------|
| a) Eosinophils | b) NK cell |
| c) Neutrophils | d) Macrophages |
- (vi) Infer that the antigen binding sites are present in which part of the antibody?
- | | |
|-------------------------------|-----------------------------|
| a) Fab regions of an antibody | b) Fc region of an antibody |
| c) only in the light chain | d) only in the heavy chain |
- (vii) State which of the following statements is false concerning the immune system?
- | | |
|-------------------------------------------------------------------------|-------------------------------------------------------|
| a) B-cells are capable of processing and presenting antigens to T-cells | b) T-cells are capable of helping to activate B-cells |
|-------------------------------------------------------------------------|-------------------------------------------------------|

- c) Antigen presenting cells are found only in the primary immune organs
- d) All nucleated cells have MHC class I antigens on their cell surface.
- (viii) Explain which two immune reactions are called the two sides of a coin
- a) Autoimmunity & Tolerance
- b) Tolerance & Hypersensitivity
- c) Autoimmunity & Hypersensitivity
- d) Tolerance & GvH
- (ix) Interpret which of the following is used for typing when a patient is being prepared for an organ transplant
- a) MHC class I molecules
- b) MHC class II molecules
- c) MHC class III molecules
- d) Both MHC Class I and MHC Class II
- (x) The proteins that are involved in the clearance of antigens/bacteria comprises of the complement system. Interpret which of the following pathway is involved in the adaptive immune response
- a) Alternative Pathway
- b) Classical Pathway
- c) Lectin Binding Pathway
- d) Endogenous pathway
- (xi) The deficiency of the complement proteins (C1q, C1q, C1s) or the complement receptors leads to the accumulation of immune complexes resulting in SLE or vasculitis. The deficiency affects which of the following complement pathway?
- a) Alternative pathway
- b) Lectin binding pathway
- c) Classical pathway
- d) None of these
- (xii) Tumor cells that can reproduce indefinitely are combined with mammalian cells that create an antibody in monoclonal antibody technology. Evaluate that the result of this cell fusion is which type of cell?
- a) Cell combo
- b) Recombined cell
- c) Hybridoma
- d) Lymphoblastoma
- (xiii) Judge that, the process of removal and replacement of damaged tissues or organs with healthy ones from a donor is called ___?
- a) transplantation
- b) replacement therapy
- c) repair and replacement
- d) none of these
- (xiv) The central tolerance occurs in the thymus and bone marrow. Select which of the following statement is true regarding central tolerance?
- a) The positive selection occurs in the cortex before maturing and entering the circulation.
- b) The negative selection occurs in the medulla.
- c) The negative selection removes cells that have high affinities for self-antigen
- d) All of these
- (xv) After exiting the thymus, mature T cells are subjected to the secondary selection where the majority of self-reactive T cells are deleted or rendered anergic. The process is known as _____
- a) Central Anergy
- b) Peripheral Anergy
- c) Clonal Anergy
- d) Selective Anergy

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Recall and draw the various steps of phagocytosis. (3)
3. Differentiate between lymphoid and myeloid lineages. (3)
4. Demonstrate the principle of flow cytometry illustratively. (3)
5. Distinguish between congenital and acquired immunodeficiencies with examples. (3)
6. Justify the importance of immunotherapy to treat cancer. (3)

OR

Estimate how can "chimeric antibody" be used for the treatment of various diseases. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Establish the mechanism of VDJ recombination in heavy chain (5)
8. Distinguish the differences between the principles of RIA and ELISA. (5)
9. Examine the process and analyze the importance of HAT selection in hybridoma technology for monoclonal antibody production. (5)
10. Various cytokines have been evaluated for use in tumor immunotherapy. Describe the mechanisms by which cytokines mediate antitumor effects with example. (5)
11. Categorize and compare different types of granulocytes involved in immune system. (5)
12. Deduce the importance of recombinant vaccines with example. (5)

OR

Compare between active and passive immunization. (5)
