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**BRAINWARE UNIVERSITY****Term End Examination 2025-2026****Programme – B.Tech.(BT)-2024****Course Name – Immunology****Course Code - BTB40109****(Semester IV)****LIBRARY**
Brainware University
Barasat, Kolkata -700125**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) Chemically an antigen may be ____ .
a) Lipid
b) protein
c) polysaccharide
d) any of these
- (ii) The T-lymphocytes and B-lymphocytes are the major cells of the
a) Lymph nodes
b) Lymphatic vessels
c) Adrenal gland
d) Thymus
- (iii) Indicate the cell that are involved in cell-mediated immunity
a) B-cells
b) Plasma Cell
c) T Cytotoxic cells
d) T Memory cells
- (iv) State the name of the early smallpox prevention method practiced in China.
a) Vaccination
b) Attenuation
c) Variolation
d) Inoculation
- (v) Identify the scientist associated with cowpox-based vaccination.
a) Louis Pasteur
b) Edward Jenner
c) Paul Ehrlich
d) Metchnikoff
- (vi) Identify the serum components responsible for humoral immunity.
a) Cytokines
b) Antibodies
c) Complement
d) Phagocytes
- (vii) Identify the primary role of MHC class I molecules.
a) Present endogenous peptides
b) Activate B cells
c) Secrete cytokines
d) Bind antibodies
- (viii) Select the chromosome carrying the human MHC locus.
a) Chromosome 1
b) Chromosome 6
c) Chromosome 12
d) Chromosome 17

- (ix) Identify the cell type that constitutively expresses class II MHC.
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|-------------------|----------------|
| a) Neutrophil | b) Erythrocyte |
| c) Dendritic cell | d) Platelet |
- (x) Choose the diagnostic test for minimal residual disease detection.
- | | |
|-------------------|-----------------|
| a) ELISA | b) Western blot |
| c) Flow cytometry | d) RIA |
- (xi) Choose the therapy involving genetically modified T cells.
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|------------------------|---------------------|
| a) Monoclonal antibody | b) Cytokine therapy |
| c) Vaccine therapy | d) CAR-T therapy |
- (xii) Choose the ELISA format used when capture antibody is immobilized.
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| a) Direct | b) Indirect |
| c) Competitive | d) Sandwich |
- (xiii) Identify the organ primarily involved in central tolerance
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|-----------|----------------|
| a) Spleen | b) Lymph node |
| c) Thymus | d) Bone marrow |
- (xiv) Recall the process eliminating self-reactive T cells
- | | |
|-----------------------|-----------------------|
| a) Clonal expansion | b) Positive selection |
| c) Negative selection | d) Isotype switching |
- (xv) Identify the term for immune unresponsiveness to self antigens
- | | |
|----------------------------|---------------------|
| a) Immunodeficiency | b) Autoimmunity |
| c) Immunological tolerance | d) Hypersensitivity |

Group-B

(Short Answer Type Questions)

3 x 5=15

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| 2. Explain how proteasomes generate peptides for antigen presentation. | (3) |
| 3. Distinguish between cell mediated and humoral immunity. | (3) |
| 4. Illustrate the role of HAT medium in selecting hybridoma cells during monoclonal antibody production. | (3) |
| 5. Identify the contribution of Edward Jenner to immunology. | (3) |
| 6. Differentiate hyperacute and acute graft rejection | (3) |

OR

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| Analyze the immunopathogenic mechanism in rheumatoid arthritis | (3) |
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Group-C

(Long Answer Type Questions)

5 x 6=30

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| 7. Explain the process of antigen presentation and its significance in the immune response. | (5) |
| 8. Describe the generation of antibody diversity through V(D)J recombination and junctional diversity | (5) |
| 9. Analyze rheumatoid arthritis mechanisms | (5) |
| 10. Describe the structure and function of the thymus. | (5) |
| 11. Analyse the consequences of splenectomy on immune function. | (5) |
| 12. Evaluate the role of flow cytometry and immunohistochemistry in cancer diagnosis and immune profiling. | (5) |

OR

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| Summarize the current trends and future perspectives of immunodiagnostics and immunotherapeutics in modern medicine. | (5) |
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