



BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – M.Sc.(MB)-2022
Course Name – Immunology
Course Code - MMBC202
(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) Recall in human B cells and T cells are matured in the
 - a) bone marrow and thymus respectively
 - b) lymph nodes and spleen respectively
 - c) bursa and thymus respectively
 - d) none of these
- (ii) Observe, what is the name of the hypervariable region of immunoglobulin, which is responsible for its diversity
 - a) CDR
 - b) Hinge region
 - c) Epitope
 - d) Agretope
- (iii) Observe Helper T cells assist in the functions of
 - a) certain B cells
 - b) certain T cells
 - c) certain B cells and other T cells
 - d) None of these
- (iv) Indicate specific immunity can be acquired either naturally or artificially and involves
 - a) Antigen
 - b) Antibody
 - c) Complement system
 - d) All of these
- (v) Cell mediated immunity is carried out by..... while humoral immunity is mainly carried out by.....
 - a) B cells/T cells
 - b) T cells/B cells
 - c) Antibodies/Antigens
 - d) Antibodies/Phagocytes
- (vi) Explain what is true about the IgM of humans
 - a) IgM can cross the placenta
 - b) IgM can protect the mucosal surface
 - c) IgM is produced by high-affinity plasma cells
 - d) IgM is primarily restricted in the circulation
- (vii) Devise, when a resting naive T-cell engages its specific MHC/peptide complex displayed on the surface of a fibroblast it:

- a) Becomes anergic
b) Undergoes blast cell formation.
c) Produces IL-2.
d) Moves from G₀ to G₁ of the cell cycle.
- (viii) 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) All of the above
- (ix) Evaluate: The specificity of antibody secreted by a B-cell may not be the same as that of the surface Ig of the clonal parent because of:
- a) Allelic exclusion.
b) Alternative splicing.
c) Different heavy:light pairing.
d) Somatic hypermutation.
- (x) Prioritize, which of the following is a part of Membrane Attack Complex
- a) Colicins
b) C3b3b, Bb
c) C5b,6,7,8,9
d) Properdin
- (xi) Summarize, DNA vaccines:
- a) Are relatively poor at stimulating cytotoxic T lymphocyte responses in mice
b) Are only effective if followed by a protein boost
c) Require cold storage in tropical countries
d) May have distinct advantages when preparing subunit vaccines against viruses which frequently alter their antigens
- (xii) Justify, A peptide immunogen:
- a) Adopts a single rigid structure in solution
b) Can elicit potent antibody responses in the absence of T-cell help
c) Can be used to stimulate B-cell but not T-cell responses
d) Can mimic a part of a discontinuous epitope
- (xiii) Interpret Microbes isolated directly from small pox beads and injected into an individual. The method is known as
- a) vaccination
b) Variolation
c) Immuno sensation
d) Passive immunity formulation
- (xiv) Choose, Helper T-cells can be distinguished from killer T-cells by the presence of _____
- a) CD-2 receptor
b) CD-3 receptor
c) CD-4 receptor
d) CD-8 receptor
- (xv) Recall the second most abundant Ig is
- a) IgD
b) IgA
c) IgM
d) IgE

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Human red blood cells are not nucleated and do not express any MHC molecules. Analyze why is this property fortuitous for blood transfusions? (3)
 3. Describe the early theories of immunology naming scientists and their invention. (3)
 4. Infer why amino acid changes generated by junctional flexibility are important (3)
 5. Predict what is the status of major histocompatibility complex in inbred and outbred populations, with respect to organ transplantation (3)
 6. Indicate the "principle" of ELISA and name the four types of ELISA (3)
- OR**
- Explain the principle of "Immunoblotting" and mention its uses (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Write a short note on antibody class switching with illustrations (5)
 8. Distinguish between innate and adaptive immunity with illustrations (5)
 9. Deduce the five stages of "phagocytosis" in details for killing bacterial or viral pathogens (5)
 10. Evaluate by how many ways can antibodies lead to host defense upon an infection/occurrence of disease (5)
 11. Compare and justify the term "DNA vaccine" and "peptide vaccine" with respect to vaccine technology (5)
 12. Assess the term "flow cytometry" and propose its applications in immunology (5)
- OR**
- Predict the difference between ELISA and ELISpot assay . Use suitable illustrations. (5)
