



BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – M.Sc.(MB)-2023

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 Natural killer cells are involved in
- | | |
|---|------------------------|
| a) tumour rejection | b) allograft rejection |
| c) non-specific killing of virus transformed target cells | d) all of these |
- (ii) Name the major constituents of cytotoxic T-lymphocyte
- | | |
|-------------|--------------------------|
| a) Lysozyme | b) Lymph |
| c) Protein | d) Perforin and granzyme |
- (iii) Predict chemically an antigen may be
- | | |
|-------------------|-----------------|
| a) lipid | b) protein |
| c) polysaccharide | d) any of these |
- (iv) State the class of antibodies, that can cross placenta is
- | | |
|--------|------------------|
| a) IgM | b) IgG |
| c) IgA | d) None of these |
- (v) Select from the following that is useful to stimulate antibody production
- | | |
|----------------|---------------------|
| a) An adjuvant | b) A hapten |
| c) Antiserum | d) Purified antigen |
- (vi) Cite, the ability of the immune system to recognize self antigens versus nonself antigen is an example of:
- | | |
|---------------------------|-----------------------|
| a) Specific immunity | b) Tolerance |
| c) Cell mediated immunity | d) Antigenic immunity |
- (vii) Infer type I hypersensitivity classically involves the following
- | | |
|--------|--------|
| a) IgE | b) IgM |
|--------|--------|

- c) IgD
 (viii) Helper T cell or CD+4 receptor is responsible for binding with
 a) HIV virus
 c) MARS virus
- d) Macrophages
 b) Corona virus
 d) SARS virus
- (ix) The proteins that are involved in the clearance of antigens/bacteria comprises of the complement system. Select the pathway that is involved in the adaptive immune response
 a) Alternative Pathway
 c) Lectin Binding Pathway
- b) Classical Pathway
 d) All of these
- (x) Tumor cells that can reproduce indefinitely are combined with mammalian cells that create an antibody in monoclonal antibody technology. The result of this cell fusion is a
 a) myeloma
 c) hybridoma
- b) natural killer cell
 d) lymphoblast
- (xi) Evaluate that the following statement is true about the Malarial parasites
 a) Malarial parasites can be best obtained from a patient when the temperature comes to normal
 c) Malarial parasites can be best obtained from a patient, a few hours after the temperature reaches normal
- b) Malarial parasites can be best obtained from a patient, an hour before the rise of temperature
 d) Malarial parasites can be best obtained from a patient when the temperature rises with rigour
- (xii) Deduce -an antigen preparation and an antibody preparation are tested by immunodiffusion. Three bands are found, indicating that
 a) The antibody was impure
 c) There was one antigen and one antibody
- b) There was more than one antigen
 d) The temperature was too high
- (xiii) Select, the T-cell receptor genes were originally identified using:
 a) Subtractive hybridization.
 c) PCR
- b) A monoclonal anti-idiotypic.
 d) In situ hybridization.
- (xiv) Evaluate :A living microbe with reduced virulence that is used for vaccination is considered
 a) Dormant
 c) Attenuated
- b) Virulent
 d) Denatured
- (xv) Interpret, Alpha beta T-cells recognizing MHC plus processed peptide can:
 a) Directly kill viruses.
 c) Scavenge unwanted metabolic products.
- b) Recognize an intracellular infection.
 d) Themselves produce antibody to directly eliminate extracellular organisms.

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Write a short note on the frequency of "somatic hypermutation" (3)
3. Explain the terms "idiotype", "allotype" and "isotype" (3)
4. Indicate the "principle" of ELISA and name the four types of ELISA (3)
5. Produce the three steps of B cell developmental process (3)
6. Explain the three different types diseases that can occur due to autoimmunity (3)

OR

Categorise how the membrane attack complex forms in complement system (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Describe "toll like receptor" ,their types and the signalling molecules affected by them (5)
8. State the structure and functions of macrophages,granulocytes and NK cells (5)
9. Deduce the mechanism of antigen processing and presentation by an antigen presenting cell to a CD4 helper T cell upon infection with Leishmania major. (5)
10. Criticize the similarities and the difference in the mechanism of CD4+T cell and CD8+T cell in responding to a pathogenic infection leading to diseases (5)
11. Some microorganisms (Mycobacterium tuberculosis and M.leprae) are classified as intracellular pathogens. Explain why the immune response to these pathogens differs from that to other extracellular pathogens.(Hint : TH1 and TH2 subtypes of T helper cells response) (5)
12. Assess the principle of Fluorescence-activated cell sorting (FACS) elucidating the aspects of cell sorting (5)

OR

Estimate the various applications of Immunology in health, diagnosis and diseases (5)
