

2021

BIOCHEMISTRY — HONOURS

Paper : CC-14

(Immunology)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer **any five** questions: 2×5
- (a) What is primary lymphoid organ? Give example.
 - (b) RBCs are more prone to complement mediated lysis than nucleated cells.—Explain.
 - (c) What are immunoregulatory hormones? Give example.
 - (d) How does adjuvant enhance immunogenicity of an antigen?
 - (e) What is delayed type hypersensitivity? Give an example.
 - (f) What are main functions of neutrophils?
 - (g) What do you mean by hematopoiesis? Where does it take place?
 - (h) What are anaphylatoxins? Give example.
 - (i) How do you distinguish between immature and mature B cells?
 - (j) What is agammaglobulinemia?
2. Answer **any two** questions:
- (a) “A single molecule of membrane bound IgM can activate the C1q component of the classical pathway of complement activation.”—Justify the statement.
Differentiate between monocytes and macrophages.
Name one professional and one non-professional antigen presenting cell. 2+1+2
 - (b) Hematopoietic stem cells are known as pluripotent stem cells.—Explain.
What stimulates the differentiation of haematopoietic progenitor cells to be committed to a particular cell lineage?
What is antibody dependent cellular cytotoxicity (ADCC)? 2+1½+1½
 - (c) What is meant by ‘serum sickness’? Which type of hypersensitivity reaction is associated with it?
Schematically demonstrate how you will detect HIV infection in a patient by ELISA technique? (1+ 1)+ 3

Please Turn Over

- (d) Differentiate between apoptosis and necrosis. Which of the processes helps in destruction of WBCs after their characteristic life span is over?

What is meant by antibody affinity and avidity? (2+1)+2

Answer **any three** questions taking **at least one** from each unit.

Unit-I

3. (a) What are the basic differences between plasma and memory B cells?
 (b) Chemical composition and heterogeneity is a requirement for an antigen for eliciting immunogenic response.—Explain.
 (c) Briefly describe the similarities and differences among cytokines and growth factors.
 (d) Briefly discuss about clonal selection theory.
 (e) What are meant by sequential and nonsequential epitopes? 2+2+2+2+2
4. (a) What is meant by antigen independent phase of B cell development?
 (b) Distinguish between the structures of MHC I and MHC II molecules.
 (c) Why are Gram-positive bacteria generally resistant to complement mediated lysis?
 (d) Discuss briefly the role of dendritic cell in immunity.
 (e) What effect will be observed after removal of bursa of Fabricius (bursectomy) from chicken?
 (f) What types of bonds are involved in antigen-antibody interaction? 1+2½+1½+2½+1+1½
5. (a) “Babies can acquire IgE mediated allergies by passive transfer of maternal antibodies.”—Justify the statement.
 (b) Distinguish between isotypic and allotypic determinants.
 (c) IgM functions more effectively than IgG in bacterial agglutination.—Explain.
 (d) Compare the antigen recognition property for B cells and T cells.
 (e) What is agglutination inhibition? How can it be used to detect the presence of illegal drugs in the blood of an individual? 2+2+1½+2+1+1½

Unit-II

6. (a) What are different mediators of type I hypersensitivity reactions?
 (b) What are the basic functions carried out by complement activation?
 (c) What is linkage disequilibrium in case of MHC molecule?
 (d) What is ‘RhoGam’? How does it function?
 (e) Name two autoimmune diseases. 2+2+2+(1+1)+2
7. (a) Briefly discuss the mechanisms by which autoimmunity has been proposed to be induced.
 (b) Describe briefly the difference between ‘Classical’ and ‘Alternative’ pathway of complement activation.
 (c) Distinguish between the characteristics of primary and secondary immune responses.
 (d) What are the two main characteristics that distinguish hematopoietic stem cells from progenitor cells?
 (e) What is meant by endogenous and exogenous antigens? Mention the pathway by which these antigens are processed. 2½+2+1½+2+2

8. (a) Indicate the type of hypersensitive reaction (I-IV) apply to the following conditions:
- (i) Systemic form of reaction treated with epinephrine
 - (ii) Involves histamine as an important mediator
 - (iii) Is an important defense against intracellular pathogens
 - (iv) Can lead to contact dermatitis.
- (b) What are the important functions of thymic stromal cells?
- (c) What type of enzyme is represented by CIs? What are the substrates for that enzyme?
- (d) What are the two main characteristics that distinguish hematopoietic stem cells from progenitor cells?
- (1×4)+2+(1+1)+2
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