

4054

4

(b) Explore the characteristics of T and B lymphocytes in the adaptive immune system. How do these cells differ in their functions, development, and mechanisms of action?

(c) Draw a well labelled diagram of complement proteins showing all the three pathways.

(6,6,6)

6. Write short notes on the following :

(i) Cytokines

(ii) Inflammation

(iii) Apoptosis

(iv) Haptens

(4.5×4)

(200)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4054

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Unique Paper Code : 3182012401

Name of the Paper : Immunobiology

Name of the Course : **B.Sc. (Hons.) Biomedical
Science (UGCF-NEP 2022)**

Semester : IV

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **five** questions in all.
3. Question No. **1** is compulsory.
4. Give illustrations and examples wherever required.
5. Subparts of the questions should be attempted together.

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4054

2

1. (a) Briefly explain the following (Any four) :

- (i) Natural Killer Cells
- (ii) Macrophage
- (iii) Anatomical barriers
- (iv) PAMPS
- (v) Daudi tumor cell (2.5×4=10)

(b) Differentiate between (Any two) :

- (i) Affinity and Avidity
- (ii) B cell epitope and T cell epitope
- (iii) Agglutination and Immunodiffusion (4×2=8)

2. (a) Describe the mechanisms by which macrophages and neutrophils kill pathogens. What are the main effector mechanisms employed by these cells?

(b) How do antigen-presenting cells (APCs) process and load antigens onto MHC molecules?

(c) Discuss different effector functions carried out by antibodies to eradicate pathogens. (6,6,6)

4054

3

3. (a) Explain concisely the underlying principle of the any two methods

- (i) ELISPOT
- (ii) Sandwich ELISA
- (iii) Agglutination reaction (6,6)

(b) Why is it necessary to get multiple booster doses for effective immunization? Discuss in detail. (6)

4. (a) Explain the concept of hypersensitivity and briefly classify different types of hypersensitive reactions.

(b) Describe the major steps in B cell differentiation in the bone marrow, including its positive and negative selection.

(c) What are monoclonal antibodies? Discuss their applications in research, diagnostics, and therapeutics, and how do they differ from polyclonal antibodies? (6,6,6)

5. (a) Discuss the concept of antibody diversity, and how does it enhance the ability of the immune system to recognize and respond to a wide range of antigens?

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