



B.Sc./6th Sem/ZOO/26(NEP)

2026

6th Semester Examination (CCFUP : NEP)

ZOOLOGY

Paper : MJ 12-T

(Single Core Major)

(Immunology)

Full Marks : 40

Time : Two Hours

The figures in the margin indicate full marks.

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

Group - A

Answer any *five* questions : $2 \times 5 = 10$

1. What are Fab and Fc regions of an antibody?
2. What is MHC restriction?
3. Name any two proinflammatory cytokines.
4. Differentiate between primary and secondary lymphoid organs.
5. Differentiate between affinity and avidity in antigen-antibody interactions.
6. Define CD markers.

P.T.O.

(2)

7. What are haptens? How do haptens become immunogenic?
8. Write two key differences between isotype and idiotype.

Group - B

Answer any *four* questions : $5 \times 4 = 20$

9. Write a short note on T-cell receptor (TCR) structure and function.
10. Describe the structure of an antibody molecule.
11. Compare the roles of dendritic cells, macrophages, and neutrophils in innate immunity. Discuss the concept of self vs. non-self discrimination in the immune system. 3+2
12. (a) Explain the biochemical basis of antigen-antibody binding forces (e.g., hydrogen bonds, hydrophobic interactions).
(b) Evaluate how environmental factors (pH, temperature) affect these interactions in vivo and in vitro. 3+2
13. Explain antigen processing pathways for endogenous and exogenous antigens with suitable labelled diagram. Discuss how defects in these pathways can affect immune surveillance in viral infections. 3+2
14. Classify cytokines based on their functions and sources. What are Th 1 and Th 2 cytokines with proper examples. 3+2

(3)

Group - C

Answer any *one* question : $10 \times 1 = 10$

15. Explain the production of monoclonal antibodies using hybridoma technology with special reference to HAT medium selection. Explain the classical pathway of complement activation. $5+5$
 16. Explain the immunological principles behind vaccine-induced memory. Compare different live, killed and subunit vaccines in terms of mechanism and efficacy. Differentiate between RIA and ELISA based on their principle and application in clinical diagnosis. $3+3+4$
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