(b) Discuss clonal selection theory in detail. IgM and IgD are coexpressed on the same B cell. Does this violate the unispecificity rule as implied by clonal selection theory? 8

6. (a) Describe with the help of diagram (Any **two**): 6+6=12
   (i) Neutrophil extravasation.
   (ii) IgA
   (iii) TS of Thymus.

   (b) What is hypersensitivity? Discuss the role of IgE in inducing hypersensitive reaction. 6

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[This question paper contains 4 printed pages]

Your Roll No. : .....

Sl. No. of Q. Paper : **1803** **I**

Unique Paper Code : 3182012401

Name of the Paper : Immunobiology

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

Semester : IV

Time : 3 Hours ***Maximum Marks : 90***

Instructions for Candidates :

(a) Write your Roll No. on the top immediately on receipt of this question paper.

(b) Attempt any **FIVE** questions in **all**. Question **NO.1** is compulsory.

(c) Give illustrations and examples wherever required.

(d) Subparts of the questions should be attempted together.

1. (a) Briefly explain the following (Any **four**): 2.5×4=10
   (i) Adjuvant
   (ii) M-cells

(iii) Macrophage

(iv) PAMPs

(v) Immunogen

(b) Differentiate between (Any **two**): 4×2=8

(i) B-lymphocytes and T-lymphocytes

(ii) B-cell epitope and T-cell epitope

(iii) Cellular immunity and humoral immunity

2. (a) What is haematopoiesis? Discuss the pathway in detail involving lymphoid and myeloid lineages. 6

(b) What is ADCC? Discuss the process in detail and explain how does it kill the target cell? 6

(c) Complement is a set of serum proteins which help the immune system to eliminate pathogens. Discuss how classical pathway of complement activation is initiated by antigen-antibody complex formation. 6

3. (a) Explain the underlying principle of the any **two** methods: 6+6=12

(i) Western blotting

(ii) ELISPOT

(iii) Agglutination

(b) Discuss the characteristics features of recombinant vaccine with an example. 6

4. (a) What are haptens? How can they be made immunogenic? Discuss with an example and its clinical significance. 6

(b) The endogenous antigens are processed in the cytosolic pathway. Discuss how does this pathway eliminate and present endogenous antigens on the membrane with class 1 MHC molecules? 6

(c) What are immunotoxins? How can they be used in the treatment of cancer? 6

5. (a) Humoral and cell mediated branch of the immune system work in collaboration to mount an effective and robust immune response. Describe in detail with the help of diagrams? 10