

**M. Sc. (Biotechnology) Sem-II (2012 Course)(Choice Based Credit System) : SUMMER - 2019**  
**SUBJECT: IMMUNOLOGY**

Day: Friday  
Date: 05/04/2019

Time: 02.00 PM TO 05.00 PM  
Max. Marks: 60

**S-2019-1411**

**N.B:**

- 1) **Q. No.1 and Q. No.5 are COMPULSORY.**
- 2) Attempt **ANY TWO** questions from **Q. No.2, 3 and 4.**
- 3) Attempt **ANY TWO** questions from **Q. No.6, 7, 8.**
- 4) Answer to both the sections should be written in **SAME** answer book.

**SECTION-I**

- Q.1** Answer the following in brief: **(10)**
- a) Define Hematopoiesis.
  - b) Name and state the function of any two secondary lymphoid organs.
  - c) Differentiate between primary and secondary immune response.
  - d) List two properties of myeloma cells used in production of B-cell hybridomas.
  - e) State the role of histamine in inflammation.
  - f) Expand the terms ITAMS and MHC.
- Q.2** Answer the following questions: **(10)**
- a) How do the three pathways of complement activation differ in the substances that can initiate complement activation?
  - b) Describe the antimicrobial and cytotoxic activities of macrophages that can destroy phagocytosed micro-organisms.
- Q.3** Answer the following questions: **(10)**
- a) Describe the steps involved in B cell maturation.
  - b) Justify: MHC locus is polygenic and polymorphic.
- Q.4** Write short notes on **ANY TWO** of the following: **(10)**
- a) Cytotoxic T Lymphocytes
  - b) Radioimmune assay
  - c) Applications of monoclonal antibodies

**SECTION-II**

- Q.5** Answer in brief (**ANY FIVE**) : **(10)**
- a) Central tolerance
  - b) Hypersensitivity
  - c) Immuno suppression
  - d) Cytokines
  - e) Natural Killer cells
  - f) Xenografts
- Q.6** Answer in brief: **(10)**
- a) Describe the mechanisms involved in first and second set of allograft rejection.
  - b) Explain the pathophysiology of Rheumatoid Arthritis.
- Q.7** Write short notes on: **(10)**
- a) Live attenuated vaccines.
  - b) Immunotherapeutic strategies for treatment of cancer
- Q.8** Describe the three phases by which the immune system can recognize and target tumor cells **(10)**

**OR**

How hypersensitivity reactions are classified? Explain Type I hypersensitivity reaction giving a suitable clinical examples.

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