

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)

CLASS: MSc  
BRANCH: BIOTECHNOLOGY

SEMESTER : III  
SESSION : MO/18

SUBJECT: SBT3001 IMMUNOTECHNOLOGY

TIME: 3.00 HRS

FULL MARKS: 60

**INSTRUCTIONS:**

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
  2. Candidates may attempt any 5 questions maximum of 60 marks.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) What are macrophages? Enlist the role of macrophages in human body. [6]  
Q.1(b) What are neutrophils? Explain its biological role in immune system. [6]
- Q.2(a) What is MHC? Explain the structure and function of MHC-II molecules. [6]  
Q.2(b) What is antigen presentation? Explain the endogenous antigen presentation. [6]
- Q.3(a) What is Primary immunodeficiency? Explain with reference to different cell lineages of immune system. [6]  
Q.3(b) Give an overview on the various factors responsible for secondary immunodeficiency. [6]
- Q.4(a) What is Scatchard plot? How we can quantify the antigen-antibody interaction mathematically. [6]  
Q.4(b) What is rocket immunoelectrophoresis? Explain. [6]
- Q.5(a) Write a note on the method and application of comet assay. [6]  
Q.5(b) Give a brief overview on the Radioimmunoassay for antigen and antibody detection in biological sample. [6]
- Q.6(a) What is hybridoma technology? Explain. [6]  
Q.6(b) Write a note on the production of recombinant vaccine. [6]
- Q.7(a) Draw a labelled diagram of stirred tank bioreactor and mention the importance of its various components. [6]  
Q.7(b) Write a note on the various types of expression system used for the production of immunotherapeutics. [6]

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