

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

CLASS: MSc BIOINFORMATICS & COMPUTATIONAL BIOLOGY  
BRANCH: BIO-ENGINEERING AND BIOTECHNOLOGY

SEMESTER : III  
SESSION : MO/2025

SUBJECT: BI312 IMMUNO-INFORMATICS AND VACCINE DESIGN

TIME: 3 Hours

FULL MARKS: 50

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  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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		CO	BL
Q.1(a)	Define Immunoinformatics. Explain how B-Lymphocytes play role in the immune response against pathogen.	[5] 1	2
Q.1(b)	What do you understand by Immunogenicity? Describe different types of vaccines.	[5] 2	2
Q.2(a)	Explain how to identify the target for vaccine designing against bacterial pathogen.	[5] 2	4
Q.2(b)	Describe how IEDB server is very significant in in-silico vaccine designing.	[5] 2	2
Q.3(a)	Describe the method and results of Vaxijen and Allertop tools.	[5] 2	2
Q.3(b)	Differentiate between Epitope and Paratope.	[5] 2	4
Q.4(a)	Describe various properties that are significant in screening B-Cell & T-Cell Epitopes in in-silico vaccine design.	[5] 2	2
Q.4(b)	What is HLA antigen? Explain Population Coverage (PPC) analysis.	[5] 2	2
Q.5(a)	Describe the structure of Antibody and its modeling techniques. Explain different types of antibodies.	[5] 3	2
Q.5(b)	Explain in brief molecular dynamics simulation and its use in vaccine design.	[5] 3	2

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