

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

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

**SEMESTER: III
SESSION: MO/2024**

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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	Marks	CO	BL
Q.1(a) Describe different types of immunity. Explain the B-Cell activation and immune response.	[5]	1	2
Q.1(b) What do you mean by vaccine lead? Explain the concept of Reverse Vaccinology.	[5]	1	2
Q.2(a) Explain any two immunoinformatics databases with their applications.	[5]	2	4
Q.2(b) What do you mean by Epitope? Differentiate between linear and conformation epitopes. How Paratopes are related to epitope.	[5]	2	2
Q.3(a) Describe the prediction of B-Cell and T-Cell Epitopes using IEDB resources.	[5]	2	2
Q.3(b) Describe Antigenicity and Allergenicity Prediction.	[5]	2	3
Q.4(a) Explain the method used to identify the vaccine target.	[5]	2	4
Q.4(b) Write a short note on Adjuvant and linkers for epitope binding.	[5]	2	4
Q.5(a) What is the Ramachandran plot? How is it useful in structure modeling of vaccine lead?	[5]	3	2
Q.5(b) What is molecular docking? Explain how docking is useful in reverse vaccinology.	[5]	3	2

:::22/11/2024:::E