

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MAKEUP EXAMINATION- 2025

PhD-I & II Semester (BTBI)

COURSE CODE (CREDITS): 25P1WBT233 (3)

MAX. MARKS: 25

COURSE NAME: Advances in Bioinformatics

COURSE INSTRUCTORS: Dr. Raj Kumar

MAX. TIME: 1 Hour 30 Min

**Note:** (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	Marks																																				
Q1.	What is the importance of data sharing among biological databases? Discuss major nucleotide sequence databases that form the INSDC.	5																																				
Q2.	Outline how you would use PubMed to find the most recent and relevant studies related to SARS-CoV-2 mutations or vaccine target identification by include search various search strategies.	5																																				
Q3.	Describe biological databases for storing, accessing and sharing of structural data.	5																																				
Q4.	Align the given sequences using Smith-Waterman algorithm following the scoring scheme Match = +1, Mismatch = -1, Gap = -2.  Seq1= ACGAA, Seq2= AGCGA	5																																				
Q5.	Calculate the phylogenetic tree for the given matrix using UPGMA method.  <table><tr><td></td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>A</td><td>-</td><td>10</td><td>9</td><td>15</td><td>6</td></tr><tr><td>B</td><td></td><td>-</td><td>12</td><td>9</td><td>11</td></tr><tr><td>C</td><td></td><td></td><td>-</td><td>12</td><td>8</td></tr><tr><td>D</td><td></td><td></td><td></td><td>-</td><td>5</td></tr><tr><td>E</td><td></td><td></td><td></td><td></td><td>-</td></tr></table>		A	B	C	D	E	A	-	10	9	15	6	B		-	12	9	11	C			-	12	8	D				-	5	E					-	5
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