JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

M.Tech-I Semester (BT)

COURSE CODE (CREDITS): 18M1WBT133 (3) MAX. MARKS: 25

COURSE NAME: Advances in Computational Systems Biology

COURSE INSTRUCTORS: Dr. Tiratha Raj Singh MAX. TIME: 1 Hour 30 Minutes

Note: (a) *All questions are compulsory. Calculator is permitted.*

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

Q.No	Question	Marks
Q1	Realize the importance of omics technologies for various kind of biological networks. Signify the interrelatedness amongst these networks through this cascade.	4
Q2	Devise all network motifs for a type of network where node number is 3. What kind of computations can be applied on these motif types?	4
Q3	Evaluate the significance of coherent and incoherent FFL motifs in a biological network which were found in a bacterial cell.	3
Q4	Differentiate between various components of TRN hierarchy. Justify your answer with an example of each component.	3
Q5	Compare the Hill function for activator and repressor with a suitable graph diagram and mathematical parameters and formulations.	3
Q6	For a 3-node network motif, a total number were observed 125 however 5 of these types were absent from the population. For the remaining 8 types, 3 were found of 25 each and remaining 5 were also found in equal amount. Calculate the subgraph concentrations for these motif types.	5
Q7	Apply the concept of significance profile (SP) on the motifs calculated in Q6. Assume all the required parameters for the calculation of SP.	3