

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-VII Semester (BT: BI Minor)

COURSE CODE (CREDITS): 18B1WBI731(3)

MAX. MARKS: 25

COURSE NAME: Computational Systems Biology

COURSE INSTRUCTORS: Dr. Tiratha Raj Singh

MAX. TIME: 1 Hour and 30 Minutes

*Note: All questions are compulsory. Marks are indicated against each question in square brackets.*

Q.1. Classify the network motifs into four major classes. Give a comparative analysis of coherent and incoherent type motifs in some real biological networks. [CO: 2, 3; Marks:4]

Q.2. Evaluate the significance of network motifs in biological networks. What kind of computations can be performed to evaluate the significance of motifs in biological networks? Demonstrate with an example. [CO: 2, 3; Marks:4]

Q.3. What is other name for input function in gene regulatory networks and pathways? For activators and repressors for this input function, discuss all the essential parameters. [CO: 3; Marks:4]

Q.4. Evaluate the existence of reductionist and integrative approaches in systems biology for a case study of core network parameters such as robustness, modularity, temporal variability and heterogeneity of data. [CO: 1-4; Marks:5]

Q.5. Realize the computational representation of regulatory pathways for a set of 6 genes. Demonstrate their respective involvement in the regulatory processes through activation, inhibition and auto regulatory effects. [CO: 1, 2; Marks:4]

Q.6. If a task is given to you to design an efficient biological system, what parameters and their respective attributes you will prefer? Explain with justification. [CO: 1, 2; Marks:4]