

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST - 3 EXAMINATION- 2021

B.Tech VII Semester

COURSE CODE: 18B1WBI731

MAX. MARKS: 35

COURSE NAME: Computational Systems Biology

COURSE CREDITS: 03

MAX. TIME: 2 Hours

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q.1. Define system and its properties. Discuss the important means to deal with a biological system in a fluent way. (3)

Q.2. Write name of any 4 computational methods for protein protein interactions. Discuss any one method in detail with a suitable example. (4)

Q.3. Demonstrate the implementation of CellML with a biological reaction model. (3)

Q.4. Differentiate between the following: (1.5\*4=6)

(i) Top down vs bottom up approach (ii) Breakdown vs Biosynthesis

(iii) Components vs systems biology (iv) stochastic vs non-stochastic

Q.5. What is a bipartite graph? Provide its implementation as a Petri nets to model a chemical reaction. (4)

Q.6. Explain the JAK-STAT signaling system. In which kind of pathways/network category will it fall? (3)

Q.7. Elaborate the expression of metabolic networks through non-causality, multifunctionality and redundancy. (3)

Q.8. What are major types through which cells communicate in multicellular organisms. (2)

Q.9. Explain the following terms: (1\*4=4)

(a) Token (b) Transition (c) Arc (d) Place

Q.10. Explain the constraint based modeling for the following reaction where combination of two compounds A and B will make a new product:

