

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2023

B.Tech-VII Semester (BIBT)

COURSE CODE (CREDITS): 18B1WBI731(3)

MAX. MARKS: 25

COURSE NAME: Computational Systems Biology

COURSE INSTRUCTORS: Dr. Raj Kumar

MAX. TIME: 1 Hour 30 Minutes

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

*(b) Marks are indicated against each question in square brackets.*

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

Q1. Describe the following topological properties in biological networks. (CO-II) [2 × 3]

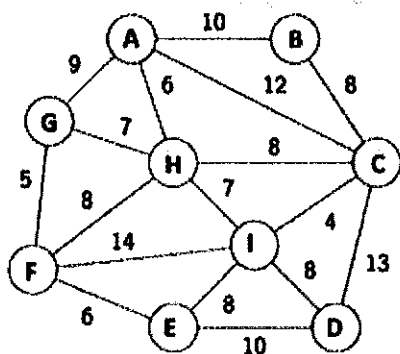
- a) The degree of a network
- b) Scale-free networks and transitivity
- c) Centralities

Q2. Describe the importance of an objective function in flux balance analysis. (CO-III) [2]

Q3. To narrow the possible steady state solution space in flux balance is critical. How can this be achieved? (CO-III) [2]

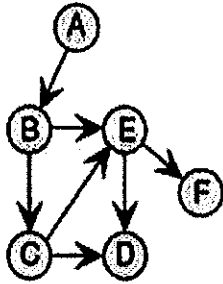
Q4. Compare the process diagram and activity flow diagram in SBGN. (CO-II) [3]

Q5. Calculate the minimum spanning tree for the following graph. (CO-IV) [3]



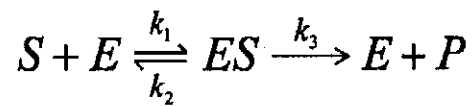
Q6. Calculate the adjacency matrix for the given graph:

(CO-III) [3]



Q7. Write the ODE model for the following pathway.

(CO-II) [3]



Q8. Calculate the stoichiometric matrix for the following metabolic network.

(CO-IV) [3]

