JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

MSc IV Semester (BT)

COURSE CODE (CREDITS): 20MSWBT433 (2)   MAX. MARKS: 35

COURSE NAME: Computational Systems Biology

COURSE INSTRUCTORS: Tiratha Raj Singh   MAX. TIME: 2 Hours

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

Q.1. Evaluate the progress of systems biology through various interdisciplinary projects and their applications. Discuss E-cell project and its working model with a case study.   [5]

Q.2. Realize the significance of markup languages in model reconstruction. Justify your answer by providing a real biological model example along with its code in a standard markup language. Discuss all the species, parameters and respective values for the same.   [7]

Q.3. Interpret the signal transduction and metabolic pathways for the following items:
(i) Functional links and states   (ii) Components and systems view   [2*3=6]

Q.4. Compose a 5 point description of the technologies used to study biological systems at different levels. Give an example of JAK-STAT pathway to demonstrate this feature.   [5]

Q.5. Propose a biological system where you can fit in all the steps of an *"Omics cascade"*. Assume all the numerical parameters arbitrarily but in such a way that, all the steps should justify the concept for the implementation of the system at horizontal as well as vertical levels.
[6]

Q.6. Examine protein-protein interactions at experimental and computational levels. Explain in details any 4 computational methods available for PPIs. Write name of 5 experimental methods for PPIs.   [6]