Exam.Code:441
Sub. Code: 3020

1115

M.Sc. (Bio-Informatics) Third Semester

MBIN-8012: Elements of System Biology

Time allowed: 3 Hours | Max. Marks: 60

***NOTE**: Attempt five questions in all, including Question No. 1 which is compulsory and selecting atleast one question from each Unit.*

x-x-x

I. Attempt the following:-

a) Define System Biology.

b) Give full forms of SBW and SBML.

c) Define variable, parameter and constant.

d) What is the application of J. Designer?

e) Differentiate between Cis and Trans-acting factors in gene regulation.

f) What are the advantages of computational modeling?

g) What is meant by 'adequateness of model'?

h) What would be the main problem associated with the study of multiple gene regulatory circuits. (8x1½)

UNIT-I

II. a) Discuss the control of biological systems giving suitable example.

b) Write notes on the following:-

i) Model behaviour

ii) System state (6,6)

III. a) Explain the various steps in development of a biological model.

b) What are the advantages of Robustness and Redundancy in biological systems? Explain using suitable examples. (6,6)

UNIT- II

IV. Write notes on the following:-

a) MathML and its application in systems biology.

b) Genetic programming (6,6)

V. Discuss the following:-

a) Virtual cell and its applications in system biology

b) Petri Nets (6,6)

UNIT- III

VI. a) What is a toogle switch?

b) Discuss Endo 16 regulatory system. (2,10)

VII. a) Briefly explain main features of lamda phage lysogeny-lysis model.

b) Discuss the human erythrocyte model and its applications. (4,8)