

**M. Sc. Bioinformatics Sem.-III (2013 Course) (Choice Based Credit
Systems) : SUMMER - 2019**
SUBJECT: SYSTEMS BIOLOGY

Day: Friday
Date: 05/04/2019

Time: 02.00 PM TO 05.00 PM
Max. Marks: 60

S-2019-1471

N.B.:

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Attempt any **TWO** questions from the remaining questions from each sections.
- 2) Answers to two section should be written in '**SAME**' answer books.
- 3) Figures to the **RIGHT** indicate full marks.
- 4) Draw neat labelled diagrams **WHEREVER** necessary.

SECTION-I

Q.1 Answer any **FIVE** of the following: **(10)**

- a) What are calibrations?
- b) Explain stiffness.
- c) What are the fundamentals subspaces of stoichiometric matrices?
- d) Explain equilibria.
- e) What do you understand by Model Constraints?
- f) What are the limitations of forrester diagram?

Q.2 Answer any **TWO** of the following: **(10)**

- a) What are the goals of system Biology?
- b) What are the problems with classical view approach?
- c) Errors in FORRESTER DIAGRAM.

Q.3 What is the difference between System Biology and Bioinformatics? Why is it said that system biology has fuzzy boundaries? **(10)**

OR

Explain Predator Prey Model.

Q.4 What is the purpose of Qualitative modelling? List down and explain all components which are placid inside and outside of forrester diagram. **(10)**

OR

Describe classical view approach of modelling?

P. T. O.

SECTION-II

Q.5 Answer any **FIVE** of the following: (10)

- a) Why is it said that driving variable is dependent on time?
- b) Explain model.
- c) Explain object.
- d) What is discrimination models?
- e) What is dynamic validations?
- f) What is robustness?

Q.6 Explain Predator-Prey Model? (10)

OR

Write a script/ program for the following Simpson's equation.

X =	0.0	0.25	0.50	0.75	1.00
Y =	0.0	0.06	0.20	0.36	0.50

Q.7 Explain –Modularity based studies. (10)

OR

Short note –System level Modelling.

Q.8 Answer any **TWO** of the following: (10)

- a) Which are the techniques used for model validation?
- b) Solve the following trapezoidal equation:

X =	0.0	0.5	1.5	2.0	2.5	3.0	3.5	4.0
Y =	0.0	0.6	0.5	0.4	0.3	0.2	0.2	0.1

h= 0.5
- c) Explain the non-classical approach.

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