

23/10

Exam. Code : 206603

Subject Code : 5147

M.Sc. Bio-Informatics 3rd Semester
**SYSTEM BIOLOGY & METABOLIC PATHWAY
ENGG.**

Paper—BI-633

Time Allowed—3 Hours] [Maximum Marks—75

SECTION—A

Note :— Section A is compulsory.

Explain the following :

1. Robustness of a model
2. Modular design
3. Lambda phage
4. Diffusion coefficient
5. Quorum sensing
6. Virtual erythrocyte
7. EMP
8. MetaCyc
9. Metabolic engineering
10. Genome annotation. 1.5×10=15

SECTION—B

Note :— Answer *one* question from each unit.

UNIT—1

1. What is system biology ? Discuss how models in biological sciences can help in understanding at system level.
2. What do you understand by eukaryotic gradient sensing ? Discuss a model to explain.

UNIT—2

3. Derive Michaelis-Menten equation. Explain its significance.
4. Discuss a genetic switch in Lambda phage.

UNIT—3

5. Discuss :
(A) Minimal gene set concept
(B) System biology for complex disease.
6. Discuss how system biology can be used to understand organism and its interaction with environment.

UNIT—4

7. Discuss any two metabolic pathway databases. Explain their feature and significance.
8. Explain different mechanisms of metabolic pathways regulation at enzyme level.

UNIT—5

9. Explain significance and features of ENZYME and LIGAND databases.
10. Discuss tools used for comparison of metabolic pathways. How can information generated through these comparisons be useful ? 5×12=60