Exam. Code : 206603
Subject Code :   4621

M.Sc. Bio-Informatics Semester—III

SYSTEM BIOLOGY AND

METABOLIC PATHWAY ENGG.

Paper : BI–633

Time Allowed—3 Hours]   [Maximum Marks—75

SECTION—A

Note :— Section A is compulsory.

1. Explain the following :   (1.5×10=15)

   (a) Redundancy in model of biological system

   (b) Bioreactor

   (c) Modular design

   (d) Chemotaxis

   (e) E-cell

   (f) Virtual erythrocyte

   (g) EcoCye

   (h) Allosteric enzyme

   (i) Genome annotation

   (j) Metabolic engineering.

SECTION—B

Note :— Answer **one** question from each unit. (5×12=60)

UNIT—1

2. Discuss rapid pole to pole oscillation in *E.coli*. Explain its significance.

3. Discuss models for eukaryotic gradient sensing.

UNIT—2

4. What are genetic oscillators ? Discuss modeling of *Escherichia coli* chemotaxis.

5. What are synthetic genetic switches ? Derive Michaelis-Menten equation.

UNIT—3

6. What is quorum sensing ? Compare this process in gram negative and gram positive bacteria.

7. What is whole cell simulation ? Discuss its significance.

UNIT—4

8. Write a short note on :

    (a) KEGG   (b)   EMP.

9. What is feedback inhibition ? How it is used for regulation of enzyme activity ? Explain using an example.

UNIT—5

10. Discuss methods used for comparison of metabolic pathways. Discuss Ligand database.

11. Discuss how knowledge of metabolic pathways can be utilized for full genome annotation. Write a note on Brenda database.