

B.Sc. 6th Semester (Honours) Examination, 2020-21

PHYSICS

Course ID: 62416

Course Code: SH/PHS/603/DSE-3/T-6

Course Title: Biological Physics (DSE T6)

Time: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Section-I

1. Answer any *five* questions: 2×5=10

- a) What is metabolism?
- b) How are proteins and nucleic acids related?
- c) What are the basic difference between neutral evolution and natural selection?
- d) Discuss neural network.
- e) Are bacteria unicellular or multicellular?
- f) What cells help membrane formation?
- g) Which properties contribute to its ability to self-replicate?
- h) What is a feedback loop in an ecosystem?

Section-II

2. Answer any *four* questions: 5×4=20

- a) Explain time scales and spatial scales. Why is scale important?
- b) “Random walk leads to diffusive behaviour”- Explain the statement.
- c) What are the roles of nucleic acid in structure formation?
- d) Write a short note on associative memory models.
- e) Describe the causes of biological evolution.
- f) What do you mean by self-sustaining ecosystem? Explain with example.

Please Turn Over

Section-III

3. Answer any *one* question:

10×1=10

- a) (i) “Memories as attractors of the neural network dynamics.”-Explain.
(ii) What is electro-osmotic effect? Write down different types of cells in multi-cellular organisms.

6+(1+3)

- b) Discuss the models of cellular dynamics. What do you mean by stoichiometric matrix? Why is gene regulatory network important?

(6+2+2)
