U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January 2024 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 21CS7BSBFE **Max Marks: 100**
Course: Biology for Engineers

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	Explain the functions of the nucleus.	**6**
	b)	Analyze the difference between animal cell and plant cell with diagram.	**10**
	c)	Differentiate the cell with respect to the number of nucleus.	**4**

UNIT - II

2	a)	Illustrate the different strategies of recombination with examples.	**6**
	b)	Illustrate the evolutionary approach to optimization with a neat diagram and write pseudo code of evolutionary algorithms.	**10**
	c)	Analyze the different replacement strategies in evolutionary algorithm.	**4**

OR

3	a)	Explain the different flavors of evolutionary algorithms.	**6**
	b)	Write the basic Ant Colony Optimization algorithm for the travelling salesman problem.	**10**
	c)	Analyze the design decision w.r.t pheromone initialization for Ant Colony Optimization algorithm.	**4**

UNIT - III

4	a)	Explain the different forms of communication in Swarm Intelligence.	**6**
	b)	Illustrate the standard Particle Swarm Optimization algorithm.	**7**
	c)	Illustrate the main issues that influence the way in which Cellular Automata (CA) languages support the design of applications on high performance architecture	**7**

UNIT - IV

5	a)	Explain the basic steps of genetic algorithms with appropriate flowchart.	**6**
	b)	Explain the central Dogma of Biology with a diagram. Analyze the advantage of gene expression.	**10**
	c)	Analyze the difference between Recombinant DNA technology and Genetically Modified Algorithm.	**4**

OR

6	a)	Analyze how fitness value can be obtained from binary genes in i) Absence of gene expression ii) Presence of gene expression.	**8**
	b)	Illustrate the use of Inversion Vector for 1 7 6 9 5 8 3 4 2 and recovering from permutation mentioning all steps. Also state the advantage of using an inversion vector.	**8**
	c)	Explain the functions of gene control regions.	**4**

UNIT - V

7	a)	Explain the objectives of bioinformatics.	**4**
	b)	Illustrate the use of Nano molecules for cancer detection or cancer treatment.	**10**
	c)	Explain the working of biosensor. Also mention the applications of biosensor.	**6**

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