5901

CSE 205

B.Tech. IVth SEMESTER EXAMINATION, 2024-25

BACHELOR OF TECHNOLOGY

(CSE)

Evolutionary Computing

Time : Three Hours] [Maximum Marks : 75

Note: There are **three** sections (**A, B** and **C**) and candidate has to attempt questions from all sections. Marks are indicated against each section.

Section-A

1. Attempt all parts of the following : 5×3=15

   (a) What is Reinforcement Learning ? Explain with the help of example.

   (b) Explain Swarm intelligence in detail.

   (c) Write short notes on Radial Basis Function.

   (d) What is the need of Evolutionary Computation ? Explain its evolution.

   (e) Explain McCulloch-Pitts Neural Network.

Section-B

Note : Attempt all questions : 4×5=20

2. (a) How Evolutionary Algorithm is different from conventional Techniques ? Explain.

   OR

   (b) Write Pseudo code of Evolutionary algorithm with flowchart.

3. (a) How engineering optimization problems can be solved using Bees Algorithm ? Explain with the help of Algorithm and Flowchart.

OR

(b) Explain memetic Algorithm with the help of example.

4. (a) Differentiate between supervised and unsupervised machine Learning.

OR

(b) Differentiate between the Adaline and Modaline Neural Network.

5. (a) What is genetic operators ? Explain various types selection, crossover and mutation.

OR

(b) If the fitness value of three individual A, B, C are given as -

S. N.	Individual	Fitness
1.	A	1
2.	B	4
3.	C	5

Then find the probability of best fittest according to the Linear Rank based selection.

Section-C

Note : Attempt any two questions : 2×20=40

6. (a) Explain particle Swarm optimization with the help of Algorithm. How PSO helps in various real life problems.

(b) Explain Ant Colony Optimization (ACO) with pseudo code & diagram.

7. (a) What is fitness function ? Show the implementation of genetic algorithm to maximize the function $F(x) = x^2$ over $\{0 - 31\}$, given :

Population size : 4
initial population : {13, 14, 8, 19}
crossover : 1 point crossover
Mutation : Bit-wise mutation
Selection : Roulette Wheel Selection.

(b) Write the Python implementation code of Genetic Algorithm with 2 Genes and 5 chromosomes for 2 generations.

8. (a) What is Activation function ? Explain various types of activation functions with formula.

(b) What is neural Network ? Explain various types of Neural Network with diagram.

9. (a) Explain Black Box Model. What are COP, CSP & FOP ? Explain with the help of real life examples.

(b) Design a perception that performs the Boolean function AND. Show each Epoch and update the weights until the Boolean AND Function gives the desired output.

Given : -

$W_1 = 0.3$

$W_2 = -0.2$

$\alpha = 0.2$

Bias $(\theta) = 0.4$.

Use-Binary Step Function

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36
18
12
66 +20
26