BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2024)

CLASS: BTECH **SEMESTER : VI**
BRANCH: ECE **SESSION : SP/2024**

SUBJECT: EC377 INTELLIGENT COMPUTING AND OPTIMIZATION

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Write the steps involved in Optimal design formulation?	[2]	1	L
Q.1(b)	What are the three different types of optimal points? Explain with suitable examples.	[3]	1	M
Q.2(a)	What are the advantages and shortcomings of gradient based methods over the direct methods for finding optimum solution. State some examples of both methods.	[2]	1	M
Q.2(b)	Bracket the minimum of the function $f(x)=x^2+(54/x)$ using bounding phase method. Take the initial guess $x^{(0)}=0.6$, delta=0.5, k=0	[3]	1	H
Q.3	Use two iterations of the bisection and Secant method to minimize $f(x)=x^2+(54/x)$ and compare in terms of the interval obtained.	[5]	1	H
Q.4(a)	What is the need of crossover and mutation operation in Genetic algorithm? What are various types of crossover techniques used in GA?	[2]	2	M
Q.4(b)	Show only one iteration of solving the problem: Maximize $f(x)=x^2$, $0<x<31$ using Genetic algorithm.	[3]	2	H
Q.5(a)	How Particle Swarm Optimization is different from Genetic algorithm?	[1]	2	M
Q.5(b)	Explain the PSO algorithm. Support your answer with proper explanation of the parameters involved in the velocity and position updating equations.	[4]	2	M

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