BRAC UNIVERSITY
Inspiring Excellence

CSE422: Artificial Intelligence
Fall 2024
Theory QUIZ-02
Duration: 40 Minutes

A

Name:	ID:	Section:

1) Assume [X1, X2, X3, X4, X5, X6, X7, X8] represents a set of 8 numbers where each number can be anything from 1 to 100. Now your task is to find such a set with a combination of numbers where the difference between sum of the even numbers and sum of the odd numbers is 30. And you have to solve this problem using Genetic Algorithm.

a. Encode the problem and deduce two parent chromosomes, PC1 and PC2. But for PC1, the value of X2 should be 20, and for PC2 the value of X4 should be 10. **(3)**
b. Define a suitable fitness function for the problem and calculate the fitness of PC1 and PC2.**(4)**
c. Illustrate single point crossover after X4 between PC1 and PC2, and then perform mutation. You can mutate a number of your choosing. Finally, calculate fitness of the two newly formed child chromosomes and comment on which child is fitter. **(3)**
d. What is elitism? What is its advantage?**(2)**

2) a. From the following state space tree what is the goal node? And Why? **(2)**
b. Let's say an agent starts from state A, can we reach the goal if it follows simple Hill Climb Algo? What would be the path from start node A? **(5)**
c. Is there any drawback that you noticed after the simulation? If so, what is it? **(1)**