National University

of Computer and Emerging Sciences Peshawar Campus

Student Name: _____ Roll No: _____

Program: BS(CS)
Semester: Fall-2022
Time Allowed: 1.5 hours
Course: CL2002 Artificial Intelligence

Examination: Quiz # 1
Total Marks: 100 Weightage: 10
Date: Dec. 02th 2022 02:00 PM
Instructor Name: Zeshan Khan

NOTE: Attempt all questions.
Read each question completely before answering it. There are 3 **questions** on **1 page.**

In case of any ambiguity, you may make assumption that should not contradict statement in the question. Make a separate file for each of the questions with the filename as RollNo_QNo.py e.g. P181234_Q1.py

Search Algorithm	
Question No. 1	**[Time: 30 Min] [Marks: 5+20=25]**

You are provided with a two-dimensional array (5 × 5) of integers and interested to perform search operations on that array.

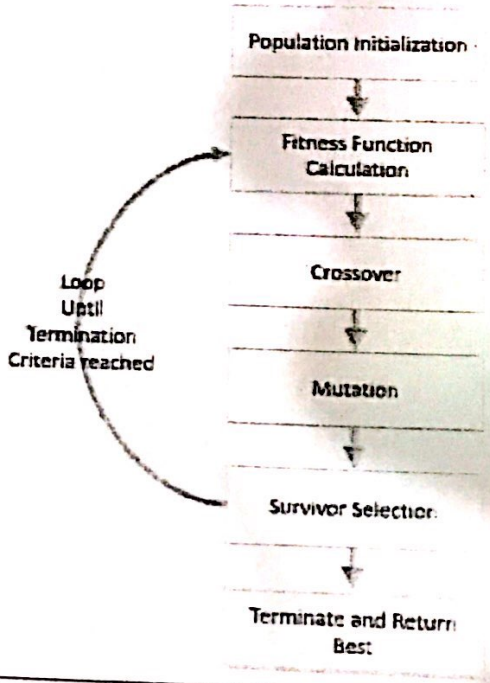
A) Write code to initialize array with random integers.
B) Apply A* Algorithm on the provided array for searching an element.

Genetic Algorithms	
Question No. 2	**[Time: 30 Min] [Marks: 10+10+10=30]**

The basic idea of the genetic algorithm is presented in the figure below. You are required to code the functions listed below with chromosome size of 5.

A) Population Initilization (Population size of 5 with random numbers from 1 to 5)
B) Fitness function
   a. The fitness is value generated by the sequence by considering all numbers as digits of a number. E.g. (fitness of [1,2,3,4,5] is 12345)
C) Mutation (Mutate the value of any gene/location with +1 or -1)

Assume rest of the functions are implemented.



Uninformed Search Algorithms	
Question No. 3	**[Time: 20 Min] [Marks: 10]**

You are provided with a graph in the form of an adgecency matrix. Write python code for the BFS on the graph.