BRAC University
Department of Computer Science and Engineering

CSE 422: Artificial Intelligence (C)

Quiz 02: Spring 2025 Time: 30 Minutes Marks: 10

Name		ID		Section	

1. State whether it is true or false and justify: Simulated Annealing with a constant, positive temperature at all times is the same as Hill-Climbing. [2]

   False as the positive temperature will let simulated annealing take bad steps.

2. **The Alien Coin Selection Problem:** An alien has n coins in it's pocket of different denominations (25 paisa, 50 paisa, 1 taka, 2 taka and 5 taka). It has to give the rickshaw fair f by pulling out coins from the pocket. The problem is it does not know the value of the coins as it can not read. Initially, it draws some coins out of the pocket. Ricksha-wala helps to count and lets him know the total value. However, that is not correct. Now it has to draw again or do something intelligent. It decides to use a local search strategy to find the solution. Now answer the followings:

   (a) What is the search space size if the alien can pick any subset of coins? [2]

   2^n

   (b) Propose a neighborhood for the local search (hill climbing / simulated annealing) provide an example. [3]

   Flip, Say the alien has got 10 coins and current representation is 1001001101, here 1 means the coin is used and the 0 means the coin is not used, now one can single flip the 0/1 to get a neighboring solution. $1001001\underline{1}01 \longrightarrow 1001001\underline{0}01$

   (c) Will it be a minimization or a maximization problem? Justify. [3]

   It can be a minimization problem. Say the actual amount is c and the amount slecte by the alien is x, then the minimization problem is to minimize $|c - x|$.