BRAC University
Department of Computer Science and Engineering

CSE 422: Artificial Intelligence (A)

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

Name		ID		Section	

1. State whether it is true or false and justify: If the temperature is very large (i.e., close to ∞) at every iteration, Simulated Annealing will move to a randomly selected successor state at each iteration.[2]
   True, except for the better quality solutions, it will accept them.

2. In local search for n-queen problem, we used a single-flip neighborhood where a single queen position was randomly altered. We could have also used a double flip operation. What would be the size of the neighborhood in that case? Show an example. [3]

   ${}^{n}C_2 \cdot (n-1) \cdot (n-1)$

3. You are running simulated annealing algorithm. You want to perform a restart to improve when the algorithms gets stuck either in local minima or a plateau. How do you detect whether you are stuck or not? [2]

   We can keep a counter *nonImprovingSteps* and whenever there is a bad step taken this counter will be increased, otherwise set to 0. If this goes beyond a certain threshold, we may consider it a stagnation.

4. What are the possible disadvantages of using genetic algorithms over a population based simulated annealing? [3]

   Genetic algorithm requires more computation due to the crossover and selection.