CDS521 Foundation of Artificial Intelligence
Written Assignment 2
(Due: 28th April, 2023)

Multiple Choice Questions (20 marks)

1. Which of the following statement is false about an agent? (2 marks)
   A. An agent can perform actions to affect the environment through its actuators.
   B. The agent function maps percept histories (sequences) to actions.
   C. The agent function cannot determine how the agent interacts with the environment.
   D. The agent program runs on the physical architecture to produce the agent function.

   Ans: [ ]

2. Which of the following statement is true about a rational agent? (2 marks)
   A. A rational agent should be omniscient.
   B. A rational agent should choose an action that is expected to maximize its performance measure.
   C. A rational agent will always be successful.
   D. A rational agent should be clairvoyant.

   Ans: [ ]

3. Which of the following metric(s) is/are suitable for measuring the problem-solving performance of a problem-solving agent (2 marks)?
   A. Completeness
   B. Effectiveness/Optimum
   C. Efficient/Complexity
   D. All of the above

   Ans: [ ]

4. Which of the following statement is false (2 marks)?
   A. Single-state problems are deterministic and fully observable.
   B. Exploration problems often have a known state space.
   C. Multiple-state problems are non-observable.
   D. Contingency problems are nondeterministic and/or partially observable.

   Ans: [ ]

5. Which of the following is the correct ordering of agents in the increasing order of generality: (2 marks)?
   A. Simple reflex agents, Reflex agents with state, Goal based agents, Utility based agents
   B. Simple reflex agents, Goal based agents, Reflex agents with state, Utility based agents
   C. Goal based agents, Simple reflex agents, Reflex agents with state, Utility based agents
   D. Simple reflex agents, Utility based agents, Reflex agents with state, Goal based agents

   Ans: [ ]

6. Which of the following is/are false about informed search? (2 marks)
   A. A* search prioritize the expansion of paths that have lower estimated cost.
   B. A* search is optimal if the heuristic function is admissible**.**
   C. Best-First search is a greedy approach.
   D. Best-First search is optimal.

   Ans: [ ]

7. Which of the following is/are true about heuristic function? (2 marks)
   A. A heuristic is admissible if it estimates the cost to be smaller than the actual cost.
   B. Best-first search can always search the best node to be expanded in each iteration if the heuristic function is omniscient.
   C. In reality, errors in the estimation of the heuristic function will not cause the search to go astray.
   D. Both A and C are true

   Ans: [ ]

8. Which of the following statement is false about hill climbing algorithm? (2 marks)
   A. Hill climbing algorithm will never be stuck at local optimum.
   B. Stochastic hill climbing may find better solutions than traditional hill climbing algorithm in some state landscapes.
   C. First-choice hill climbing is a good strategy when many states in a problem has many successors.
   D. Random-restart hill climbing performs a series of hill-climbing searches from randomly generated initial states.

Ans: [ ]

9. Which of the following statement is false about simulated annealing? (2 marks)
   A. Simulated annealing allows bad moves such that it can escape from local optimum.
   B. If the potential next state is worse than the current state, the probability of simulated annealing to move to that next state is $e^{\Delta E/T}$.
   C. It is not possible for the simulated annealing to reach global optimum.
   D. During the learning process of simulated annealing, the frequency of selecting bad move will gradually decrease.

Ans: [ ]

10. Which of the following statement(s) is/are true about genetic algorithm (2 marks)?
   A. Genetic Algorithm searches the solution to a problem by simulating natural selection.
   B. Genetic Algorithm keeps individuals with a bias to good fitness.
   C. Both A and B are true.
   D. Both A and B are false.

Ans: [ ]