

MID TERM EXAMINATION**Mar-2023****MC312 Artificial Intelligence****Time: 1:30 Hours****Max. Marks: 20****Note : All questions are compulsory.****Assume suitable missing data, if any.**

Q.1. Given the initial state and final state of 8-puzzle problem as:

Initial State

2	8	3
1	6	4
7		5

Final State

1	2	3
8		4
7	6	5

Apply and explain the working of A* algorithm to convert the initial state of 8-puzzle to its final state as given above. For any node n, consider $g(n)$ = depth of node from the root/initial state, and $h(n)$ = number of misplaced tiles. [5 marks][CO2, CO3]

Q.2. Explain the working of Divide and Conquer Frontier Search technique to prune the closed list, i.e., the list which maintains the nodes which have already been visited by any search algorithm.

[3 marks] [CO1, CO2]

Q.3. Explain, along with the reason(s), which of the following statements are correct. Also explain shortly the reason(s) why the statement is correct / incorrect. [3 marks][CO1, CO4]

- a. DBDFS (Depth Bound Depth First Search) is a complete algorithm.
- b. Amongst Breadth First Search (BFS) and Depth First Search (DFS), DFS always finds the shortest solution from start state to goal state, if the solution exists in the search space.