

Name: \_\_\_\_\_

Roll Number: \_\_\_\_\_

## Quiz-1

**Max. Time: 20 min**

**Max. Marks: 20**

Note: Solve all parts. Limit your written responses to the provided space.

**Q.1. [5]** Choose by putting a check mark on the most appropriate option. Note: No cutting/overwriting allowed.

i. Number of nodes explored by IDS are always lesser than that for BFS.

(A) True ☒ (B) False

ii. A\* search on a graph is the same as BFS with  $h(n)=0$ .

☒ (A) True ☐ (B) False

iii. If  $g(n)$  varies from node to node in a graph of a problem (e.g. TSP), BFS is the algorithm of choice.

(A) True ☐ (B) False

iv. A search algorithm using only the nearest neighbor heuristic for a TSP problem, i.e.  $g(n)=0$ , will always find the shortest path from the given node to the goal node.

(A) True ☐ (B) False

v. A \_\_\_\_\_ heuristic expands more states than a(n) \_\_\_\_\_ heuristic.

(A) Admissible, Informed (B) More Informed, less informed (C) Informed, Admissible ☒ (D) None of the given choices

**Q.2. [5+5]**

a) For a search involving a variable branching factor, give a formula to find all nodes generated by depth first search to find a goal in the worst case.

$$S = \frac{1 - b^{d+1}}{1 - b}$$

b) Give a formula to find the total number of nodes at level 2 for a search involving 'd' levels.

$$S = b^2$$

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**Q.3. [5]**

Give an admissible heuristic for the towers of Hanoi problem.

**Ans.** Here is one possibility.

*$h(n)$  = Number of discs on the goal peg not placed in their designated location*