

MCA-506: ARTIFICIAL INTELLIGENCE
Mid Sem Examination

Time: 1 Hour

Total Marks: 15

1. Solve the following cryptarithmic problem, using the strategy of backtracking with forward checking and the MRV (Minimum Remaining Values) and least-constraining-value heuristics.

$$\begin{array}{r} \text{MAP} \\ + \text{MAP} \\ \hline \text{SPOT} \\ \hline \end{array}$$

[5]

- 2.
- (a) List the major differences between Best-first, Greedy best -first and A* algorithms. [2]
- (b) What do you understand by underestimation and overestimation of a heuristic function? Under what conditions A* gives optimal solution. [2]

3. Find the most general unifier if it exists using the algorithm for m.g.u. for each of the following:

(a) $Q(y, (A, B)), Q(G(x, x), y)$.

(b) $\text{Knows}(\text{Father}(y), y), \text{Knows}(x, x)$.

[2]

4. Obtain the skolem standard form of the following expressions giving step by step execution:

(a) $\forall x \exists y \exists z \exists w \forall v \forall t \exists u P(x, y, z, t, u, v, w)$

(b) $\exists z \exists y \forall x \exists w \exists v \forall u Q(u, v, w, x, y, z)$

[4]