National Institute of Technology Kurukshetra
Department of Computer Engineering
Artificial Intelligence and Soft Computing (CSPC204/ITPC204) (CS/IT/MC)
Mid-Term Examination-II, Even Semester, 2024-25

Time: 50 Minutes Total Marks: 15

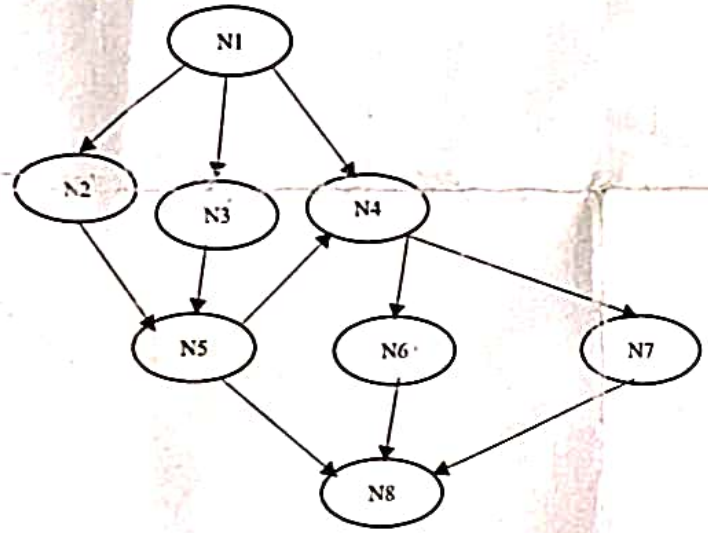
Note: Attempt all the questions. If require any missing data; then choose suitably.

**Q1.** What is simulated annealing algorithm? In a local search problem if current state has value = 80, neighbouring state has value = 75 and temperature T = 10. What is the probability of accepting this worse move in Simulated Annealing? **[3 marks]**

**Q2.** Given three Boolean variables A, B, C and Knowledge Base (KB), where KB is $(A \Leftrightarrow (B \vee C)) \wedge (\neg A)$. Prove $KB \models \neg C$, using model-based entailment. **[3 marks]**

**Q3.** Consider the following network. The direction of the edges defines the direction of traverse. N1 is start node and N8 is goal node. The actual distances between the nodes are unknown. However, a heuristic function is available with the search agent, which defines the distance of a node from goal node. The heuristic function is given below. Use greedy best-first search to find path from N1 to N8.

**[4 marks]**




| Node | H(n) |
|---|---|
| N1 | 12 |
| N2 | 7 |
| N3 | 8 |
| N4 | 9 |
| N5 | 11 |
| N6 | 3 |
| N7 | 4 |
| N8 | 0 |

**Q4.** Explain α-β pruning algorithm and write its pseudocode. Also explain the steps of pruning and show the final pruned node in flowing tree. **[5 marks]**

ALPHA--BETA PRUNING