BCA [Honours]

[CBCS]

B.Sc. Fifth Semester End Examination-2023

(Regular & Supplementary Paper)

PAPER-DSE1T

Artificial Intelligence

Full Marks: 40 ***Time: 02 Hrs***

The figures in the right hand margin indicate marks
Candidates are required to give their answers in their own words as far as practicable
Illustrate the answers wherever necessary

Group A

1) Answer any FIVE questions of the following: **5x2= 10**

i) Define search space, goal distance and goal for problem solving using search.

ii) Represent the following facts using FOPL:

a. Rammohan is a Bengali

b. All Bengalis are Indians

iii) What is uninformed search?

iv) What is a Constraint Satisfaction Problem?

v) Explain why breadth first search is a special case of uniform cost search.

vi) What is the time complexity and space complexity for breadth first search technique, with respect to branching factor b and depth d?

vii) What is the main advantage of any heuristic search algorithm over blind search?

viii) How do you evaluate any search technique?

Group B

Answer any FOUR questions of the following: **4x5 = 20**

2) Write down the disadvantages of hill climbing search procedure.

3) When does simulated annealing algorithm behave like hill climbing?

4) A problem solving search can proceed in either the forward or the backward direction. What factors determine the choice of direction for a particular problem

5) Give one example of a problem in which solutions requiring minimum search are more appropriate than optimal solutions. Give reasons for your choices.

6) What is Alpha-Beta Pruning in Minimax Search?

7) Justify why the amount of memory required to run the minimax algorithm with alpha beta pruning is $\theta(b^d)$ for branching factor b and depth limit d.

Group C

Answer any ONE question of the following: **1x10 = 10**

8) Draw a decision tree corresponding to the following expression:
If (Weather = Hot $\wedge$ Humidity = High) $\vee$ (Weather = Cool $\wedge$ Humidity = Moderate) $\vee$ (Weather = Rainy $\wedge$ Wind = Strong) Then start reading a storybook.

9) Apply resolution theorem to prove the following theorem:
$p \vee q, p \rightarrow r, q \rightarrow r \Rightarrow r$.
