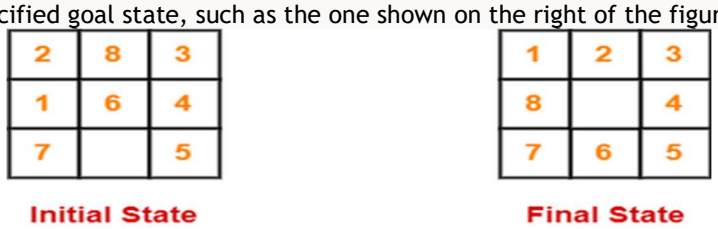
BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2023)

CLASS: B. TECH — **SEMESTER : VII**
BRANCH: (CS and IT) — **SESSION : MO/2023**

SUBJECT: IT420 ARTIFICIAL INTELLIGENCE

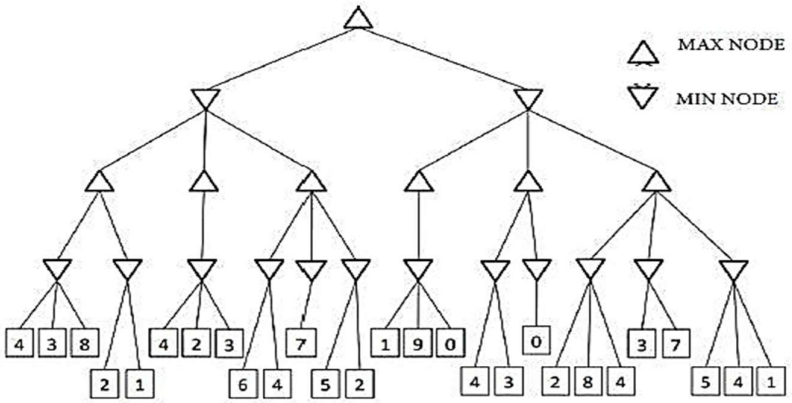
TIME: 02 Hours — **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	*What is knowledge-based system? With the help of a bloc diagram show the structure of knowledge base system*	[2]	3	1
Q.1(b)	What are AI techniques? How AI technique can be applied to Tic Tac Toe problem? Explain the possible heuristic for Tic Tac Toe problem	[3]	1	3
Q.2(a)	Suppose you are asked to design an agent-based system for Medical diagnosis purpose. You have chosen GOAL BASED and UTLTY BASED agents. How will you proceed with your design.	[2]	1	4
Q.2(b)	You are given two jugs, a 4 liter and a 3 liter one. Neither have any measuring markers on it. There is a pump that can be use to fill the jug with water. How can you get exactly 2 liter of water into the 4 liter jug? Solve the problem using production Rules. Generate the production system and find out which rules are used successively to achieve the goal.	[3]	2	2
Q.3(a)	With some practical example, show how Simulated annealing algorithm wor*k*s?	[2]	2	2
Q.3(b)	The 8-puzzle consists of a 3×3 board with 8-PUZZLE eight numbered tiles and a blank space. A tile adjacent to the blank space can slide into the space. The object is to reach a specified goal state, such as the one shown on the right of the figure:  By using left, right, up, and down action sequences show the steps for Best First Search using suitable heuristics.	[3]	2	3
Q.4(a)	How A* search *is* different from Best First search? Show with the respect of cost function.	[2]	2	4
Q.4(b)	*What is Hill climbing search algorithm. Discuss the problems of this algorithm*	[3]	2	2

PTO

Q.5(a) Give the values calculated by minimax for all states in the tree. Indicate Which branches of the tree will be pruned by alpha---beta pruning. [2] 2 3



Q.5(b) *Solve the given crypto arithmetic problem:* [3] 2 3

```
   SEND
+  MORE
-----------
  MONEY
```

:::::19/09/2023 M:::::