R22 Regulation *Subject code:4P6GE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Supplementary Examinations, November 2025

EXPERT SYSTEMS

(CSM)

Maximum Marks: 60 Date:13.11.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	Consider a 3-puzzle where, like in the usual 8-puzzle game, a tile can only move to an adjacent empty space. 1 2 3 Find the all-possible next states for 3-puzzzle problem.	1M	CO1	1
b)	Justify the statement "The alpha beta search algorithm computes the same optimal moves as the minimax algorithm"	1M	CO1	1
c)	List the different types of knowledge representation.	1M	CO2	1
d)	What is a rule-based deduction system?	1M	CO2	1
e)	Outline the characteristics of an expert system.	1M	CO3	1
f)	How do expert systems differ from conventional procedural programs?	1M	CO3	1
g)	Categorize expert system tools based on their features.	1M	CO4	1
h)	How are object-oriented languages used in expert system development.	1M	CO4	1
i)	Define the key issues in knowledge acquisition.	1M	CO5	1
j)	Identify the common pitfalls in planning an expert system	1M	CO5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	Illustrate the process of breadth first search and depth first search with suitable examples.	10M	CO1	3
	OR			
3	Explain Hill climbing. Apply the hill climbing algorithm to solve any one AI problem and discuss its limitations.	10M	CO1	3
4	Discuss the syntax and semantics of predicate logic with suitable knowledge representation.	10M	CO2	1
	OR			
5	Explain the following structured knowledge representation techniques: semantic nets and frames.	10M	CO2	1

6	Illustrate the architecture of an expert system with a neat diagram and explain the function of each component.	10M	CO3	1
	OR			
7	Explain the types of problems handled by expert systems.	10M	CO3	1
8	Discuss the techniques of knowledge representations in expert systems	10M	CO4	1
	OR			
9	Evaluate how expert system tools support the process of knowledge acquisition, representation, and validation. Provide a real time example.	10M	CO4	4
10	Describe the steps involved in building an expert system using a suitable example.	10M	CO5	5
	OR			
11	Analyze the key challenges encountered when collaborating with domain experts during knowledge acquisition and expert system development. Provide suitable examples.	10M	CO5	5