R22 Regulation *Subject code: 4P7FB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, May 2026

ARTIFICIAL INTELLIGENCE

(IT)

Maximum Marks: 60 Date:07.05.2026 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	BTL
1.a)	List various types of agents	1M	1	L1
b)	What is a search strategy?	1M	1	L1
c)	What is a knowledge-based agent?	1M	2	L1
d)	What is a Horn clause? Why are Horn clauses important in logic programming?	1M	2	L1
e)	Write the difference between unification and lifting?	1M	3	L1
f)	List the various quantifiers. Write the symbol used for each quantifier	1M	3	L1
g)	Give one difference between a category and an object.	1M	4	L1
h)	List the algorithms used for state-space search	1M	4	L1
i)	Mention any two sources of uncertainty in AI systems	1M	5	L1
j)	How is knowledge represented in uncertain domains?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a. List and discuss the components of a well-defined problem. b. What are informed search methods? Discuss greedy best-first search	5M 5M	1	L2 L2
	OR			
3	Define an Intelligent Agent. Describe the different types of agents and explain their structure and functioning with suitable examples.	10M	1	L3
4	a. What is Alpha–Beta pruning? Explain how it improves the efficiency of minimax search. b. Explain the Wumpus World environment with diagram.	5M 5M	2	L2 L2
	OR			
5	a. Explain how forward and backward chaining are used for reasoning in AI systems. b. Define logic and explain the difference between propositional and first-order logic.	5M 5M	2	L3 L2
6	a. Define and explain the syntax of First-Order Logic in detail. Discuss the rules for forming valid expressions and formulas.	5M	3	L2

	b. Explain the inference rules used in propositional logic and how they are extended in First-Order Logic.	5M		L2
	OR			
7	Illustrate with examples how Unification and Lifting work together in logical inference mechanisms.	10M	3	L3
8	Discuss state-space planning, plan-space planning and hierarchical planning approaches.	10M	4	L2
	OR			
9	Discuss the assumptions made in classical planning and explain the importance of classical planning in AI.	10M	4	L2
10	a. Define Independence in probability theory and discuss its significance in probabilistic reasoning. b. Explain Bayes' Rule and its applications in Artificial Intelligence.	5M 5M	5	L2 L3
	OR			
11	Discuss advantages and disadvantages of various uncertainty reasoning frameworks (Bayesian, Dempster-Shafer, and Fuzzy Logic)	10M	5	L4