R22 Regulation *Subject code: 4P7FB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Regular Examinations, November 2025

ARTIFICIAL INTELLIGENCE

(IT)

Maximum Marks: 60 Date: 26.11.2025 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	BloomTx
1.a)	Define AI. Mention any two applications of AI.	1M	1	L1
b)	What is rationality of an agent?	1M	1	L1
c)	Define utility function.	1M	2	L1
d)	What is the Wumpus World?	1M	2	L1
e)	Define a predicate in first order logic	1M	3	L1
f)	List the various quantifiers. Write the symbol used for each quantifier.	1M	3	L1
g)	Define ontology in Artificial Intelligence. Name any two components of ontology.	1M	4	L1
h)	Mention any two assumptions of classical planning.	1M	4	L1
i)	What is uncertainty in Artificial Intelligence? Give one example of an agent acting under uncertainty.	1M	5	L1
j)	Define a Bayesian Network?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BloomTx
2	a) Define an Intelligent Agent. Explain its structure with a neat diagram. b) Differentiate simple reflex agents and model-based reflex agents.	5M 5M	1	L2 L4
	OR			
3	a) List and state the various uniformed search strategies b) Discuss the breadth first search in detail.	5M 5M	1	L2 L2
4	a) Define Constraint Satisfaction Problems (CSPs). Explain CSP with map coloring problem b) Illustrate Alpha–Beta pruning with a suitable example and game tree diagram.	5M 5M	2	L2 L3
	OR			

5	Define a game tree. Explain the working of the Minimax algorithm with an example.	10M	2	L2
6	a) What is First-Order Logic (FOL)? Discuss how it differs from propositional logic with suitable examples b) Explain how First-Order Logic is used to represent knowledge in intelligent agents. Discuss the steps involved in building a knowledge base using FOL.	5M 5M	3	L2 L3
	OR			
7	a) Explain the inference rules used in propositional logic and how they are extended in First-Order Logic. b) What is Unification in First-Order Logic? Explain its process in detail with examples.	5M 5M	3	L2 L3
8	Describe Events, Mental Events, and Mental Objects in Knowledge Representation.	10M	4	L2
	OR			
9	Illustrate the working of forward and backward state-space search techniques in classical planning with example.	10M	4	L3
10	a) Discuss the sources of uncertainty in AI systems and the importance of handling uncertainty in intelligent decision-making. b) Explain Bayes' Rule and its applications in Artificial Intelligence.	5M 5M	5	L2 L3
	OR			
11	a) Explain the Dempster-Shafer Theory of Evidence in detail. b) Explain the Semantics of Bayesian Networks in detail.	5M 5M	5	L2 L2