THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY

IN-SEMESTER EXAMINATION-I

TE (Semester-VI)

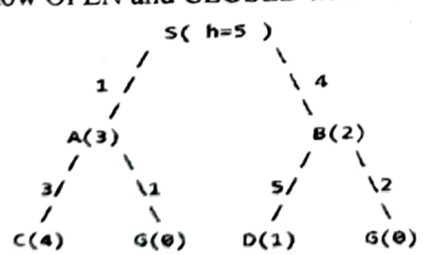
SUBJECT – Professional Elective –I Artificial Intelligence

Branch: IT
Div.: ALL
Duration: 60 Minutes

Date: 07/03/2026
Timing: 02:00 pm to 03:00 pm
Maximum Marks: 20

Instructions –

1. All questions are compulsory.
2. Assume suitable data wherever necessary and state the assumptions made.
3. Diagrams / sketches should be given wherever necessary.
4. Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5. Figures to the right indicate full marks.

Q.1		**Answer any 5 of the following questions**	Marks	Course Outcomes	Learning Levels
	a.	Summarize any two applications of Artificial Intelligence.	2	CO1	U
	b.	Define Artificial Intelligence.	2	CO1	R
	c.	Discuss an agent environment?	2	CO1	U
	d.	Identify two limitations of Depth First Search (DFS).	2	CO2	AN
	e.	Explain the purpose of path cost in Uniform Cost Search (UCS)?	2	CO2	U
	f.	Determine the role of temperature in Simulated Annealing?	2	CO3	AN
	g.	Illustrate heuristic function? State one desirable property of a good heuristic.	2	CO3	U
Q.2	a.	Determine how time and space complexity affect the choice of uninformed search techniques.	5	CO2	AN
		OR			
	b.	A game-playing agent uses Min–Max but performs slowly. Explain the possible reasons.	5	CO2	E
Q.3	a.	Apply A* Search Algorithm to find the optimal path from Start node S to Goal node G. Heuristic values $h(n)$ h(n) are given in brackets. Show OPEN and CLOSED lists at each step and compute total path cost. 	5	CO3	A
		OR			
	b.	Examine Simulated Annealing and discuss how it avoids local optima.	5	CO3	A

THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY
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TCET/EXAM/FRM/IP-03/06 REVISION : B

IN-SEMESTER EXAMINATION-II

TE(Semester-VI)

SUBJECT – Professional Elective –I Artificial Intelligence

Branch: IT **Date: 23/04/2026**
Div.: ALL **Timing: 12:00 PM to 1:00 PM**
Duration: 60 Minutes **Maximum Marks: 20**

Instructions –

1. All questions are compulsory.
2. Assume suitable data wherever necessary and state the assumptions made.
3. Diagrams/sketches should be given wherever necessary.
4. Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5. Figures to the right indicate full marks.

Q.1		Answer any 5 of the following questions	Marks	Course Outcomes	Learning Levels
	a.	Analyse one limitation of propositional logic.	2	CO4	AN
	b.	Apply backward chaining to a simple problem and explain two advantages observed in the process.	2	CO4	A
	c.	Define Generative AI.	2	CO5	U
	d.	Differentiate between BERT and GPT.	2	CO5	AN
	e.	Summarize one ethical concern associated with AI development.	2	CO6	U
	f.	State industry applications of AI and discuss their societal impact and ethical implications.	2	CO6	A
	g.	List two future trends in deep learning and machine learning and evaluate their impact on industry transformation.	2	CO6	U
Q.2	a.	Apply the resolution method to solve a given logical problem and explain the outcome.	5	CO4	A
	b.	Analyze the role of the Wumpus World environment in knowledge representation.	5	CO4	AN
Q.3	a.	Analyze the differences between Encoder-only, Decoder-only, and Encoder–Decoder models.	5	CO5	AN
	b.	Design a Transformer-based solution for multilingual translation and justify the architecture used.	5	CO5	C

END SEMESTER EXAMINATION, May 2026

26 MAY 2026

T.E. SEMESTER VI (CBCGS-HME 2023)

Branch:	**Information Technology**	**Q.P. Code:**	**E665RM264-PE-1-2-1**
Subject:	**PE-I Artificial Intelligence**	**Duration:**	**2 Hours**
Subject Code:	**PEC-IT 6013**	**Max. Marks:**	**60**

Instructions: 1. All sections are compulsory
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary and state the assumptions clearly.

Section I Short Answer Questions (Answer any 05 questions out of 06) **(10 Marks)**
(Fundamental, Core Types)

Q. No.		Marks	CO	RBT Level	PI
A.	Define an Artificial Intelligence problem with one example.	2	CO1	U	1.7.1
B.	Demonstrate the concept of an agent environment to a real-world system and illustrate it with a suitable example.	2	CO1	A	2.5.3
C.	Analyze one limitation of Depth First Search (DFS).	2	CO2	AN	2.8.3
D.	Apply an informed search to a simple problem and explain its significance in improving search efficiency.	2	CO3	A	1.2.1
E.	Construct a First-Order Predicate Logic (FOPL) to represent a real-world statement and explain its reasoning	2	CO4	A	1.2.1
F.	Analyze how Transformer architecture processes sequence data efficiently using self-attention.	2	CO5	AN	1.7.1

Section-II **Descriptive Answer Questions (Answer any 04 out of 06)** **(20 Marks)**
(Descriptive, Comprehension Types)

A.	Illustrate intelligent agents with suitable examples.	5	CO1	A	2.6.1
B.	Describe Bidirectional Search with a suitable example.	5	CO2	AN	2.6.3
C.	Analyze Hill Climbing and discuss its limitations.	5	CO3	A	2.8.3
D.	Examine the role of the Wumpus World environment in knowledge representation and reasoning.	5	CO4	AN	2.8.3
E.	Demonstrate how BERT is used for feature extraction.	5	CO5	A	2.6.4
F.	Outline the process of knowledge acquisition in Expert Systems.	5	CO6	A	2.6.3

Section-III **Long Answer Question (Answer any 03 out of 05)** **(30 Marks)**
(Application, Analytical, Evaluation, Design Type)

A.	Explain intelligent agents, agent functions, and rationality.	10	CO1	A	2.6.1
B.	Design an adversarial search strategy for large branching games.	10	CO2	AN	5.2.2
C.	Apply A* Search Algorithm to find the optimal path from Start node S to Goal node G. Heuristic values $h(n)$ h(n) are given in brackets. Show OPEN and CLOSED lists at each step and compute total path cost. State the advantages of A* search.	10	CO3	E	1.2.1