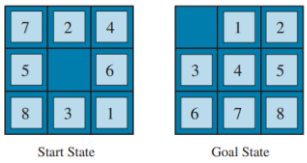
STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2023 – 2024 and thereafter)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024
INFORMATION TECHNOLOGY
THIRD SEMESTER

COURSE : CORE
PAPER : ARTIFICIAL INTELLIGENCE
SUBJECT CODE : 23CS/PC/AI35
TIME : 1 1/2 HOURS **MAX. MARKS: 100**

Q. No.	SECTION A (10 x 2 = 20)	CO	KL
1.	What is Artificial Intelligence?	CO1	K1
2.	Explain Cognitive psychology.	CO1	K1
3.	What do the terms node, edge, and root represent in the context of a search tree?	CO1	K1
4.	 What is Manhattan distance? If h2 = the sum of the distances of the tiles from their goal positions, Calculate h2 for the above diagram.	CO1	K1
5.	Define Semantics.	CO1	K1
6.	Write the objects of event calculus with an example.	CO2	K2
7.	State Utility theory.	CO2	K2
8.	What is probability density function?	CO2	K2
9.	Write the formula to calculate the Expected Utility of a Lottery.	CO2	K2
10.	What are cooperative games?	CO2	K2
Q. No.	**SECTION B (4 x 5 =20)**	**CO**	**KL**
11.	a) Identify and explain the contributions from neuroscience in advancing AI. **(OR)** b) Identify the agents and the environment in the context of Intelligent Agents, and explain their roles.	CO3	K3
12.	a) Apply the Breadth-First Search (BFS) algorithm, and explain its time and space complexity, highlighting how it finds the shortest path when all actions have the same cost. **(OR)** b) Apply the depth first search algorithm and its variant backtracking search in a scenario.	CO3	K3
13.	a) Construct the two standard quantifiers of first order logic with example. **(OR)** b) Utilize the domain of family relationships, or kinship domain, to describe first-order logic with functions and predicates.	CO3	K3

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14.	a) Examine the different basic probability notations. **(OR)** b) Examine the Value Iteration algorithm of Markov Decision Process (MDP).	CO4	K4
Q. No.	**SECTION C (6 x 10 =60)**	**CO**	**KL**
15.	a) Identify and explain briefly the Risks and Benefits of AI. **(OR)** b) Utilize reports to describe the state of the art in Artificial Intelligence.	CO3	K3
16.	a) List the four basic kinds of agent programs that embody the principles underlying almost all intelligent systems and brief on any two kinds with diagrams. **(OR)** b) Examine the AND-OR-SEARCH problem for the Search with Nondeterministic Actions.	CO4	K4
17.	a) Discuss on the applications of image processing with AI. **(OR)** b) Write and explain the GENETIC-ALGORITHM in the evolutionary algorithms.	CO4	K4
18.	a) Analyze the steps involved in the knowledge engineering process of first order logic. (**OR**) b) Assess a real-world case study of Natural Language Processing (NLP) in AI.	CO5	K5
19.	a) Explain about smoothing and its forward–backward algorithm. (**OR**) b) Explain the syntax and semantics of Relational Probability Models on Probabilistic Programming with example.	CO5	K5
20.	a) Discuss how AI-based traffic management handle complex decision-making in dynamic and unpredictable traffic environments. (**OR**) b) Provide an example of a real-world application of reinforcement learning, such as in robotics or game-playing, and explain how RL contributes to solving the problem.	CO5	K6

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