Q. Code:466945

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Third Semester

AD22301 – ARTIFICIAL INTELLIGENCE

(Common to Artificial Intelligence and Data Science and Computer Science and Engineering)

(Regulation 2022)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO1	Apply intelligent agent frameworks for toy problems	**3**
CO2	Apply search algorithms for game playing	**3**
CO3	Perform logical reasoning	**3**
CO4	Perform probabilistic reasoning under uncertainty	**3**
CO5	Learn robotic frameworks for various application domains	**3**

PART- A (20 x 2 = 40 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	List the capabilities that a computer should possess for conducting a Turing Test.	**1**	**2**
2.	What are the factors that a rational agent should depend on at any given time?	**1**	**2**
3.	Define an Omniscient agent.	**1**	**2**
4.	What do you mean by Iterative deepening search?	**1**	**2**
5.	What are Stochastic Games?	**2**	**2**

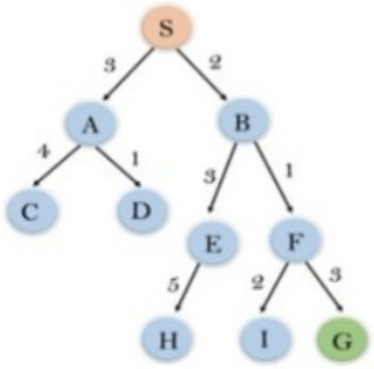
6.	What is K-Consistency?	**2**	**2**
7.	Differentiate between the Most Constrained Variable and Least Constrained Variable.	**2**	**3**
8.	Brief about the types of Constraints.	**2**	**2**
9.	What are Quantifiers?	**3**	**2**
10.	Write the following under Predicate Logic: EVIL KING JOHN BROTHER OF RICHARD RULED ENGLAND IN 1200.	**3**	**2**
11.	What is a Skolem Constant?	**3**	**2**
12.	State the Modus Ponens rule in Propositional logic.	**3**	**2**
13.	Enlist the drawbacks of Rejection Sampling.	**4**	**2**
14.	What is Uncertainty?	**4**	**2**
15.	Differentiate between Exact Inference and Approximate Inference.	**4**	**3**
16.	State the applications Bayesian network.	**4**	**2**
17.	Write short notes on Temporal difference Q-Learning.	**5**	**2**
18.	How do Humanoid Robots function in Healthcare?	**5**	**2**
19.	What do you mean by Reward Function?	**5**	**2**
20.	Give short notes on Direct Utility Estimation.	**5**	**2**

PART- B (5 x 10 = 50 Marks)

			Marks	CO	RBT LEVEL
21. (a)	**(i)**	What is an Agent? Brief about different types of Agents along with their architecture.	**(5)**	**1**	**2**
	(ii)	Give short notes on uninformed search methods.	**(5)**	**1**	**2**

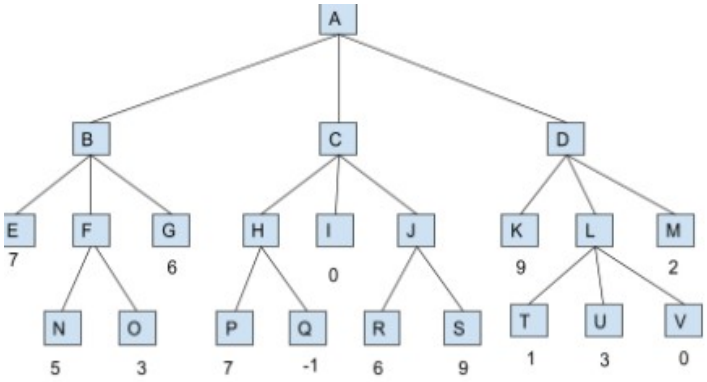
(OR)

(b)		Present the A* algorithm and trace it to find the most cost-effective path to reach from start state S to final state G by considering the following graph:	**(10)**	**1**	**2**



node	H (n)
A	12
B	4
C	7
D	3
E	8
F	2
H	4
I	9
S	13
G	0

22. (a)		Consider the following game tree in which static scores are all from the first player's point of view. Suppose the first player is the maximizing player, what move should be chosen? Find the nodes that need not be examined.	**(10)**	**2**	**3**



(OR)

(b)	Under the Constraint Satisfaction Procedure, solve the following Cryptarithmetic Problem: BASE+BALLS=GAMES	**(10)**	**2**	**3**
23. (a)	Explain Backward and forward Chaining, Illustrate it in logic representation.	**(10)**	**3**	**3**

(OR)

(b)	Consider the following facts: a) All students in 4th year are intelligent b) Raja is a 4th year student. c) Ragu is a 3rd year student d) 3rd-year students are not intelligent e) 4th Year students have no friends in 3rd year Represent the facts in the predicate, convert to clause form, and prove by resolution, Raja is not a friend of Raghul.	**(10)**	**3**	**3**
24. (a)	Elucidate Bayesian Network and Joint Probability Distribution in detail.	**(10)**	**4**	**3**

(OR)

(b)	Elaborate on the Applications & Limitations of the Hidden Markov Model in	**(10)**	**4**	**3**

AI.

25. (a)	Discuss Passive Reinforcement Learning and show learning is done from rewards.	**(10)**	**5**	**3**
	(OR)			
(b)	With relevant examples, Illustrate Reinforcement Learning in Robotic Frameworks.	**(10)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	Develop a Wumpus World environment in which knowledge-based agents can show their worth.	**(10)**	**3**	**5**

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