Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) ARREAR- END SEMESTER EXAMINATIONS, NOV/DEC 2024

INFORMATION TECHNOLOGY
VII Semester
IT7703 KNOWLEDGE ENGINEERING AND INTELLIGENT SYSTEMS

(Regulation 2015)

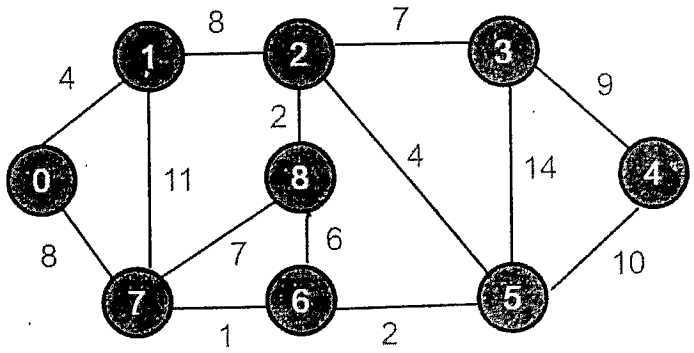
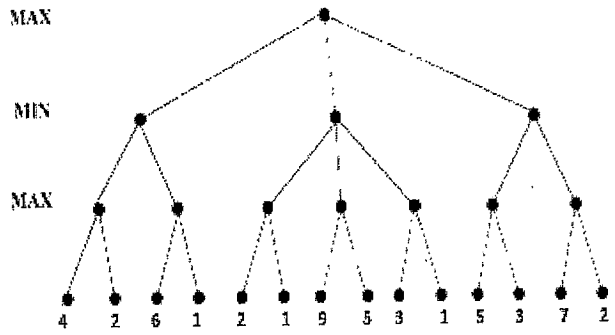
Time: 3hrs Max.Marks: 100

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

Q. No	Questions	Marks
1	What is a Rational Agent?	2
2	List out the different models of Knowledge Representation.	2
3	Differentiate informed search and uninformed search.	2
4	Compare the heuristic strategy used in Greedy Search with A* Search.	2
5	Reduce to Conjunctive Normal Form (CNF) for the formula $\neg(\neg p \vee q) \vee (r \rightarrow \neg s)$	2
6	What is a Horn clause? Give an example.	2
7	Define Kripke structures.	2
8	How monotonic logic differs from non-monotonic logic?	2
9	What do you mean by Statistical Learning?	2
10	Define the term TF-IDF in text processing.	2

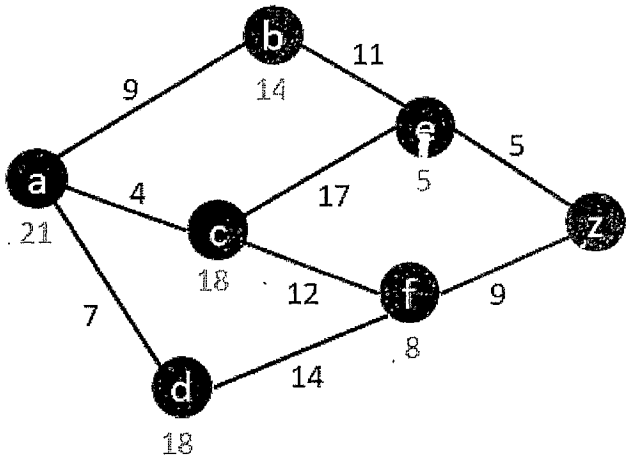
PART- B (5 x 13 = 65 Marks)
(Restrict to a maximum of 2 subdivisions)

Q. No	Questions	Marks
11 (a) (i)	With a suitable example, explain how knowledge can be represented using Semantic networks and Frames.	8
(ii)	Create an Ontology for a Sports domain using suitable entities, sub classes, relationships, properties and objects.	5
	(OR)	
11 (b) (i)	Explain the general structure of an Intelligent Agent with a suitable example.	8
(ii)	How are the environment of Agents get classified? Describe each type of environment with a suitable example.	5
12 (a) (i)	Consider the search space with his graph, where 0 denotes the start state, 4 denotes the goal state and step costs are written next to each arc. Perform a) Depth First Search b) Breadth First Search c) Bidirectional Search for the following graph:	9

		
(ii)	Write short notes on Constraint Satisfaction Problem.	4
	(OR)	
12 (b) (i)	Find the best move for the MAX player in the below tree using Minimax search strategy by writing a suitable algorithm. Consider the same tree, show the best move by applying Alpha Beta pruning algorithm. 	9
(ii)	Compare the complexity of both the algorithms with respect to the above tree.	4
13 (a) (i)	Explain the procedure of converting a Propositional Logic to Conjunctive Normal Form with a suitable example.	9
(ii)	Represent the following sentences in First order logic: a) Emily is either a surgeon or a lawyer. b) All surgeons are doctors c) Emily has a boss who is a lawyer. d) Every surgeon has a lawyer.	4
	(OR)	
13 (b) (i)	Discuss the inferences that could be made in First Order Logic using Forward Chaining algorithm with a suitable example.	9
(ii)	Consider the following formula: $(p \wedge (q \rightarrow r)) \rightarrow \neg(\neg p \vee ((\neg q) \wedge (r \rightarrow \neg r)))$. How many truth value entries does the truth table for this formula have?	4
14 (a)	Explain how Multi agent Reasoning takes place using Epistemic Logic. Illustrate the reasoning process with atleast one case study of your own.	13
	(OR)	
14 (b) (i)	Explain the syntax and semantics of Modal Logic with a suitable example.	9
(ii)	Convert the following statements to Temporal logic: a) I am always happy b) I will be working hard until I become tired	4
15 (a)	Differentiate Supervised and Unsupervised Learning. Explain any one Supervised learning algorithm in detail with an example.	13
	(OR)	
15 (b) (i)	How Learning takes place in uncertain situations? Explain with an example.	7
(ii)	Explain the steps involved in NLP to process the given text with an example.	6

PART- C (1 x 15 = 15 Marks)

(Q.No. 16 is Compulsory)

Q. No	Questions	Marks
16 (i)	Translate the following sentences to predicate logic and prove by resolution that "John likes peanuts" • John likes all kinds of food • Apples are food • Chicken is food • Anything anyone eats and isn't killed by is food • Bill eats peanuts and still alive • Sue eats everything Bill eats	10
(ii)	For the following state space, perform Greedy search to find out the goal state using heuristics given, where a is considered as the start state and z is the Goal state. 	5