RollNo. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

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

INFORMATION TECHNOLOGY
VII Semester
IT5791 & ARTIFICIAL INTELLIGENCE
(Regulation2019)

Time:3hrs Max.Marks: 100

CO1	Understand the search techniques.
CO2	Apply the search techniques to real-time problems.
CO3	Apply the reasoning techniques to real world problems.
CO4	Understand the representation of knowledge and Understand the learning techniques.
CO5	Apply AI techniques in developing real world applications.

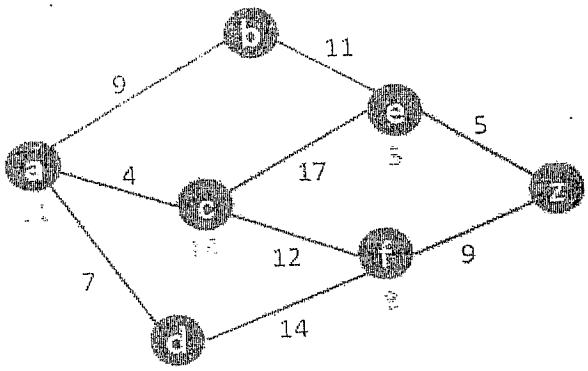
BL – Bloom's Taxonomy Levels
(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

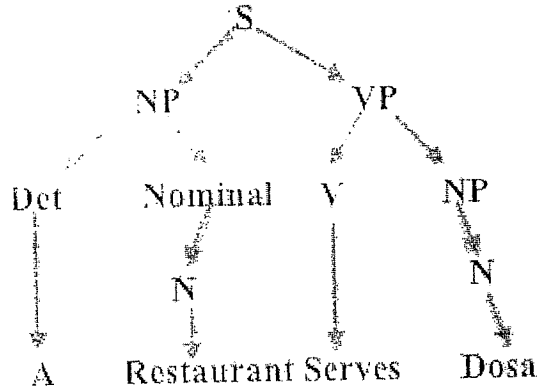
PART- A(10x2=20Marks)
(Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	Differentiate uninformed and informed search.	2	1	L2
2	What do you mean by minimum conflict heuristic in CSP.	2	1	L2
3	Illustrate with an example the Modus Ponens rule.	2	2	L2
4	State the importance of Quantifiers with examples.	2	2	L2
5	What is a frame based system?	2	3	L1
6	List the four properties of Knowledge representation.	2	3	L1
7	Give some important applications of Natural Language Processing.	2	4	L2
8	Why CFG is used to represent natural language in parsing	2	4	L2
9	What do you mean by inductive learning?	2	5	L1
10	State the importance of prior knowledge in learning.	2	5	L2

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

Q.No.	Questions	Marks	CO	BL
11 (a)	(i) Discuss in detail the characteristics of various agent structures for each agent.	8	1	L2
	(ii) Write down the PEAS description for an Interactive English Tutor agent which teaches English online to the students.	5	1	L3
	OR			
11 (b)	(i) For the following state space, perform Greedy search and A* search to find out the goal state using heuristics given, where a is considered as the start state and z is the Goal state.	8	1	L3

	 (ii) Differentiate BFS and DFS search techniques.	**5**	1	L2
12 (a)	(i) Consider the following Knowledge Base: The humidity is high or the sky is cloudy If the sky is cloudy, then it will rain If the humidity is high, then it is hot It is not hot. **Goal:** It will rain. Use propositional logic and apply resolution method to prove that the goal is derivable from the given knowledge base. (ii) Differentiate forward and backward chaining processes.	**8** **5**	2 2	L5 L2
	OR			
12 (b)	Consider the following axioms: a. Anything that is played by any student is tennis, soccer, or chess. b. Anything that is chess is not vigorous. c. Anyone who is healthy plays something that is vigorous. d. Anyone who plays any chess does not play any soccer. e. (Conclusion) If every student is healthy, then every student who plays any chess plays some tennis. Write each axiom as a well-formed formula in first-order predicate calculus. Apply required rules and transform to CNF. Prove the conclusion by resolution method.	**13**	2	L5
13 (a)	(i) Explain the use of ontology as a model of knowledge representation with suitable examples. (ii) Elaborate on the issues and challenges in Knowledge representation.	**8** **5**	3 3	L4 L4
	OR			
13 (b)	Discuss how inherited knowledge is better than simple relational knowledge. Also develop an inherited knowledge framework for the Examination evaluation process of our institution.	**13**	3	L4

14 (a)	(i)	The parse tree for the sentence "A restaurant serves dosa" is given below. Perform semantic analysis and show the semantic interpretations of the constituents. Also write the CFG for the same.  	**8**	4	L3
	(ii)	Illustrate with a scenario, the advantages of Partial order Planning over classical AI planning	**5**	4	L3
		OR			
14 (b)	(i) (ii)	Write a note on POS tagging. Distinguish between semantics, pragmatics and discourse	**6** **7**	4 4	L2 L2
15 (a)		Elaborate in detail the concept behind Explanation based learning and learning with Relevance Information.	**13**	5	L2
		OR			
15 (b)		Discuss in detail the types of chatbots, their working procedure, advantages and limitations.	**13**	5	L2

PART- C(1x 15=15Marks)

(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	(i) Solve the given problem. Describe the operators involved in it. Consider a water jug problem: You are given two jugs, a 4-gallon one and a 3-gallon one. Neither have any measuring Markers on it. There is a pump that can be used to fill the jug with water. How can you get exactly 2 gallons of water into the 4-gallon jug? Explicit Assumptions: A jug can be filled from the pump, water can be poured out of a jug onto the ground, water can be poured from one jug to another and that there are no other measuring devices available.	**8**	1	L6
	(ii) Explain how a constraint satisfaction problem (CSP) may be solved with illustration of your choice.	**7**		L2