Code No: 157AM **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, July/August - 2022
ARTIFICIAL INTELLIGENCE
(Computer Science and Engineering)

Time: 3 Hours **Max.Marks:75**

Answer any five questions
All questions carry equal marks
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1.a) Define Artificial intelligence in terms of acting humanly and thinking rationally.
b) Describe the factors of formulating a problem. Give the example of eight queen problem. [7+8]

2.a) Write a short note on model based reflex agents and utility based agents.
b) Give an overview of genetic algorithms. Give the advantages of it. [7+8]

3.a) Describe how Alpha-Beta search works with relevant examples.
b) How an intelligent backtracking is better than chronological backtracking explain with an example. [7+8]

4.a) Explain the job-shop scheduling problem with various constraints.
b) Describe the semantics of propositional logic with the truth table. [7+8]

5.a) What is meant by universal and existential quantification? Give examples for each.
b) Explain the resolution algorithm used for reasoning under first order logic with an example. [7+8]

6.a) Explain the steps used in knowledge engineering process with the example electronic circuit domain.
b) Write a short note on events and processes with examples. [7+8]

7.a) Explain about analysis of planning approaches.
b) Explain multi-agent planning. [7+8]

8.a) Explain about Bayesian nets with continuous variables.
b) Analyze the top–down inductive learning methods and inductive learning with inverse deduction. [7+8]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, January/February - 2023
ARTIFICIAL INTELLIGENCE
(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	What is well defined problem?	[2]
b)	Define search tree and write its properties.	[3]
c)	What is game tree?	[2]
d)	Explain evaluation function.	[3]
e)	Define atomic and complex sentence in first order logic.	[2]
f)	What is First order logic?	[3]
g)	Define temporal constraints.	[2]
h)	Explain classical planning.	[3]
i)	Define over fitting.	[2]
j)	State Baye's rule.	[3]

PART – B

(50 Marks)

2.a)	What is simple problem solving agent? Explain it briefly.	
b)	Discuss Greedy best first search algorithm.	[5+5]
	OR	
3.a)	What is bidirectional search ? Explain in detail.	
b)	Explain Breadth First Search algorithm with an example.	[5+5]
4.a)	Elaborate on knowledge based agents.	
b)	Explain CSP problem for job scheduling.	[5+5]
	OR	
5.a)	What is Resolution? Explain Resolution algorithm for Proposition logic.	
b)	Explain backtracking searching technique.	[5+5]
6.a)	Explain quantifier estimates and its types.	
b)	Analyze the steps in knowledge-engineering process.	[5+5]
	OR	
7.a)	Explain reasoning with default information.	
b)	Write simple forward chaining algorithm.	[5+5]

8.a) Discuss regressive relevant state space search.
b) What is Graph Plan? Explain in detail. [5+5]

OR

9.a) Describe multi agent planning.
b) Give the solution for scheduling planning. [5+5]

10.a) Explain inductive logic programming.
b) Describe Bayesian networks in detail. [5+5]

OR

11.a) What is Decision tree? Explain steps to construct to Decision tree.
b) Explain the issues in decision tree learning. [5+5]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, February/March - 2022
ARTIFICIAL INTELLIGENCE
(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
- - -

1.a) Give an overview of different kinds of agent programs.
b) Explain A* algorithm. What are the conditions for optimality? [7+8]

2.a) Explain hill-climbing algorithm with an example. What are the problems associated with hill-climbing algorithm.
b) What is an AND-OR search tree/graph? Give algorithm for searching AND-OR tree/graph. [8+7]

3. Demonstrate with an example the working of '*minimax*' algorithm and explain alpha-beta pruning technique. [15]

4.a) What are different types of local consistencies? Explain.
b) Consider the following sentence and determine whether this sentence is valid using enumeration and resolution.
$[(Food \Rightarrow Party) \vee (Drinks \Rightarrow Party)] \Rightarrow [(Food \wedge Drinks) \Rightarrow Party]$ [7+8]

5.a) Represent the following sentences using first-order logic:
i) One's mom is one's female parent.
ii) One's husband is one's male spouse
iii) Parent and child are inverse relations.
iv) A grand parent is a parent of one's parent.
b) Write short note on circumscription and default logic. [7+8]

6.a) Trace the operation of the unification algorithm on each of the following pairs of literals:
i) $f(Marcus)$ and $f(Caesar)$
ii) $f(x)$ and $f(g(y))$
iii) $f(Marcus, g(x,y))$ and $f(x, g(Caesar, Marcus))$
iv) $p(x,x)$ and $p(y,z)$
b) Explain how reasoning is accomplished using semantic networks. [8+7]

7.a) Comment on the complexity of classical planning.
b) Explain job-shop scheduling problem with and without resource constraints. [7+8]

8. Generate decision tree for the following data: [15]

Outlook	Temp	Humidity	Windy	Play Golf
Rainy	Hot	High	False	No
Rainy	Hot	High	True	No
Overcast	Hot	High	False	Yes
Sunny	Mild	High	False	Yes
Sunny	Cool	Normal	False	Yes
Sunny	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Rainy	Mild	High	False	No
Rainy	Cool	Normal	False	Yes
Sunny	Mild	Normal	False	Yes
Rainy	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Sunny	Mild	High	True	Nl

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