

Code No: 157AM

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

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- 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]

<b>Outlook</b>	<b>Temp</b>	<b>Humidity</b>	<b>Windy</b>	<b>Play Golf</b>
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	NI

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