

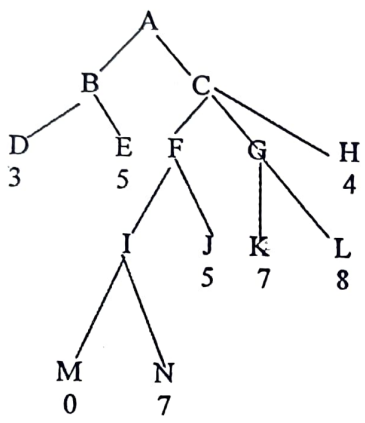
**B.Tech. (Computer Engineering)**  
**VII Semester Examinations, 2018**  
**Artificial Intelligence**  
**Paper No. CEN-703**

**Maximum Time: 3 hours.**

**Maximum Marks: 60**

**Note: Attempt all questions. All questions carry equal marks. Assume suitable missing data, if any.**

			Marks
1	<b>Q No. 1a</b>	Consider the following paragraph:	6
	<b>CO1</b>	<p>Sam, Clyde and Oscar are elephants. The following facts about them are known:</p> <ol style="list-style-type: none"> <li>1. Sam is pink.</li> <li>2. Clyde is gray and likes Oscar.</li> <li>3. Oscar is either pink or gray (but not both) and likes Sam.</li> </ol> <p>Use resolution refutation to prove that a gray elephant likes a pink elephant; that is, prove <math>(\exists x, y)[\text{Gray}(x) \wedge \text{Pink}(y) \wedge \text{likes}(x, y)]</math>.</p>	
	<b>Q No. 1b</b>	Use resolution refutation on a set of clauses to prove that there is a - green object if following are given	6
	<b>CO1</b>	<ul style="list-style-type: none"> <li>• If pushable objects are blue, then nonpushable ones are green.</li> <li>• All objects are either blue or green but not both.</li> <li>• If there is a nonpushable object, then all pushable ones are blue.</li> <li>• Object 01 is pushable.</li> <li>• Object 02 is not pushable.</li> </ul> <ol style="list-style-type: none"> <li>1. Convert these statements to expressions in first-order predicate calculus.</li> <li>2. Convert the preceding predicate- calculus expressions to clause form.</li> <li>3. Combine the preceding clause form expressions with the clause form of the negation of the statement to be proved, and then show the steps used in obtaining a resolution refutation.</li> </ol> <p style="text-align: center;">OR</p>	
	<b>Q No.1b'</b>		
	<b>CO1</b>	Explain Means Ends Analysis search technique with a suitable example.	6
2	<b>Q No. 2a</b>	Differentiate between Informed and Uninformed Search Techniques. When would Best- first search be worse than simple breadth- first search? Explain with a suitable example.	6
	<b>Q No. 2b</b>	Using a suitable example, illustrate steps of A* Search. Why is A* search better than Best First Search.	6
	<b>CO2</b>	OR	

	Q No.2b' CO2	Define Production system. List some problem characteristics and also explain the Requirements of a good control strategy.	6
3	Q No. 3a CO3	Differentiate between forward and backward reasoning. What factors determine the choice of direction for a particular problem?	6
	Q No. 3b CO3	Write the steps of alpha- beta pruning algorithm with an example. OR	6
	Q No.3b' CO3	Perform minimax on the following tree:  <pre> graph TD     A --- B     A --- C     B --- D["D 3"]     B --- E["E 5"]     C --- F     C --- G     C --- H["H 4"]     F --- I     F --- J["J 5"]     G --- K["K 7"]     G --- L["L 8"]     I --- M["M 0"]     I --- N["N 7"] </pre>	6
4	Q No. 4a CO4	What is an Expert System? How is it different from Conventional Computer System. List some major Applications of Expert System. Draw a Block diagram showing main component of a typical Expert System.	6
	Q No. 4b CO4	List and explain all the phases of Natural Language Processing with some suitable examples.	6
5	Q No. 5 CO5	Write short note on the following (Any three.) (i) Reasoning using frames. (ii)Winston's Learning Program. (iii) Application of Machine Learning. (iv)Parallel relaxation process in Hopfield network. (v) Case-Based Reasoning.	[4*3=12]

CEN-802

Roll No.....

B.Tech. (Computer Engineering) 8<sup>th</sup> Semester Examination, 2016

Artificial Intelligence

Paper No: CEN-802

Time: 3 Hours

Max Marks: 60

*(Write your Roll No. on the top immediately on the receipt of this Question paper.)*

*Note: Attempt all Questions, Assume suitable missing data, If any.*

1. (a) We are given the following paragraph:

[6]

Tony, mike and john belong to Alpine Club. Every member of the Alpine Club is either a skier or a mountain climber or both. No mountain climber likes rain, and all skiers like snow. Mike dislikes whatever Tony likes and Likes whatever Tony dislikes. Tony likes rain and snow.

Represent this information by Predicate- calculus sentences in such a way that you can represent the question "Who is a member of Alpine Club who is a mountain climber but not a skier?" as a predicate- calculus expression. Use resolution refutation with answer extraction to answer it.

Or

- (a') Use resolution refutation on a set of clauses to prove that there is a green object if we are given:

[6]

- If pushable objects are blue, then nonpushable ones are green.
- All objects are either blue or green but not both.
- If there is a nonpushable object, then all pushable ones are blue.
- Object 01 is pushable.
- Object 02 is not pushable.

1. Convert these statements to expressions in first order predicate calculus.
2. Convert the preceding predicate- calculus expressions to clause form.
3. Combine the preceding clause form expressions with the clause form of the negation of the statement to be proved, and then show the steps used in obtaining a resolution refutation.

(b) What are the disadvantages of Steepest Hill climbing Search Procedure? Using a suitable search tree, illustrate that these drawbacks are eliminated in Best First Search. [6]

2. (a) Define Production system. Discuss some problem characteristics and also explain the requirements of a good control strategy. [6]

(b) Using a suitable example, illustrate steps of A\* Search. Why is A\* search better than Best First Search. [6]

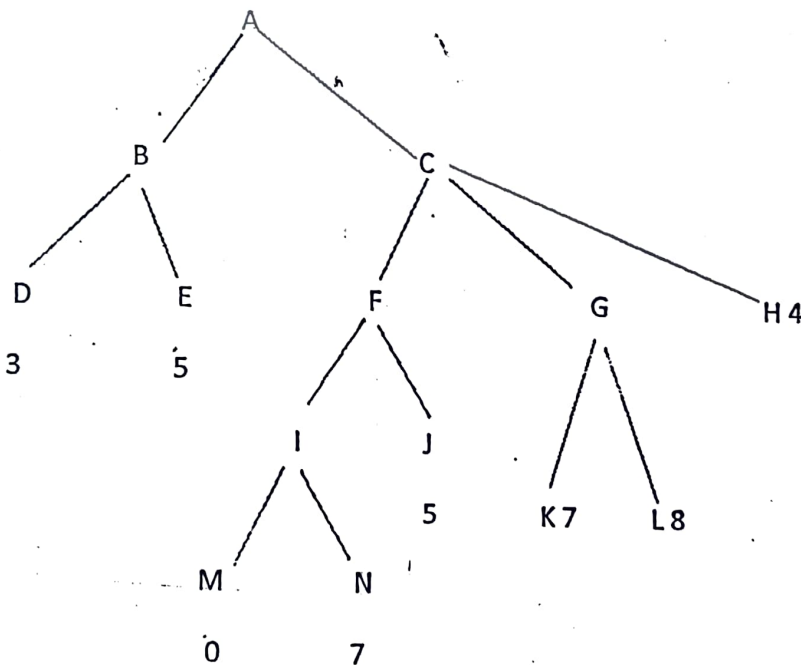
Or

(b') Differentiate between forward and backward reasoning. What factors determine the choice of direction for a particular problem? [6]

3. (a) Show a Conceptual Dependency(CD) representation of the sentence: [6]

- (i) John ate salad with a fork.
- (ii) While going home Sachin saw Brett Lee.
- (iii) Farmer fertilized the field.

(b) Perform minimax on the following tree- [6]



Or

(b') Write the steps of alpha- beta pruning algorithm with an example. [6]

4. (a) Define Machine Learning. Discuss its various applications and give classification of machine learning tasks. [6]

(b) List and explain all the phases of Natural Language Processing with some suitable examples. [6]

Or

(b') Define Expert system. How Expert system is different from conventional Computer System and also list some applications of expert system. [6]

5. Write short note on the following (Any three.)

[4x3=12]

(i) Reasoning using Frames.

(ii) Reasoning using Scripts.

(iii) Non Monotonic Reasoning.

(iv) Types of Learning.

(v) Training Problem in Neural Network.