PARSHWANATH CHARITABLE TRUST'S

A.P. SHAH INSTITUTE OF TECHNOLOGY

Department of Computer Science and Engineering
Data Science

CSE DATA SCIENCE

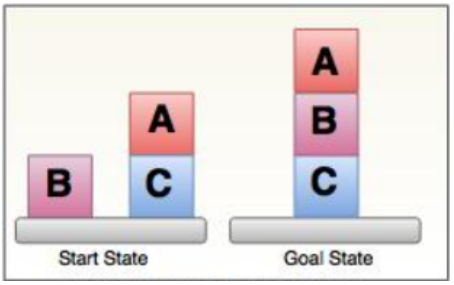
UNIT TEST-II

Class: TE **Semester: V** **Subject: AI**

Date:20/10/2023 **Time:10:00am-11:30am** **Max marks: 40**

Note the following instructions

1. **Attempt all questions.**
2. **Draw neat diagrams wherever necessary.**
3. **Write everything in Black ink (no pencil) only.**
4. **Assume data, if missing, with justification.**

Q.N	Questions	MARKS	CO	Blooms Taxonomy Level	PO
Q.1.	**Attempt any two.**				
a.	Compare and Contrast problem solving agent and planning agent.	[5]	CO6	L3	
b.	Classify the following examples into supervised, unsupervised and semi supervised learning: 1. Email Filtering 2. Pattern Recognition 3. Speech Recognition 4. Image and Speech Analysis 5. Fraud Detection	[5]	CO6	L3	
c.	Develop an MYCIN expert system.	[5]	CO6	L3	
d.	Identify the partial order planning solution for the following block world problem. 	[5]	CO6	L3	
Q.2.	**Attempt any two**				

a.	Consider the following set of sentences: a. Whoever can read is literate. b. Birds are not literate. c. Some birds are intelligent. Prove that " some who are intelligent cannot read" using resolution.	[10]	CO4	L3	PO1, PO12
b.	Write FOPL for following statements: a. Anand likes only comedy films b. The culprit has to be one from Tinker, Tailor and Butler. c. Alice does not like chemistry and history. d. Every child loves santa e. Some birds cannot fly.	[10]	CO4	L3	PO1, PO12
c.	Convert the following propositional logic statements into CNF a. A→(B↔C) b. A→(B→C)	[10]	CO4	L3	PO1, PO12
Q.3.	**Attempt any one.**				
a.	A patient goes to the doctor for a medical condition, the doctor suspects three diseases as the cause of the condition. The three diseases are D1, D2, D3, which are marginally independent from each other. There are four symptoms S1, S2, S3, S4 which the doctor wants to check for presence in order to find the most probable cause of the condition. The symptoms are conditionally dependent on the three diseases as follows: S1 depends only on D1, S2 depends on D1 and D2. S3 depends on D1 and D3, whereas S4 depends only on D3. Assume all random variables are Boolean, they are either 'true' or 'false'. 1. Draw the Bayesian network for this problem. 2. Write down the expression for the joint probability distribution as a product of conditional probabilities.	[10]	CO5	L3	PO1, PO12

<table>
<tr>
<td>b.</td>
<td>Find the probabilistic inference by enumeration of entries in a full joint distribution table shown in following figure
<table>
<tr><td></td><td colspan="2">toothache</td><td colspan="2">¬toothache</td></tr>
<tr><td></td><td>catch</td><td>¬catch</td><td>catch</td><td>¬catch</td></tr>
<tr><td>cavity</td><td>.108</td><td>.012</td><td>.072</td><td>.008</td></tr>
<tr><td>¬cavity</td><td>.016</td><td>.064</td><td>.144</td><td>.576</td></tr>
</table>
(i) No cavity when toothache is there
(ii) p(Cavity! toothache or catch)</td>
<td>[10]</td>
<td>CO5</td>
<td>L3</td>
<td>PO1, PO12</td>
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