

CIE: Internal Assessment Details

Internal Assessment Question Paper – 2
Ramaiah Institute of Technology
 (Autonomous Institute, Affiliated to VTU)
Department of Computer Science and Engineering

Programme: B.E **Term:** Oct 2021- Feb 2022**CIE:** Test 2 **Subject:** Artificial Intelligence**Credits:** 3:0:1:0**Sem:** V**Sec:** A,B, C**Date:** 04/02/2022**Max Marks:** 30**Subject Code:** CS53**Time:** 09.30AM–10:30AM**Portions for Test:** (L20-L34)**Instructions to Candidates:**

1. **Question 1 is Compulsory.** Answer any one question from 2 and 3.
2. Each Question carries 15M. **Write figures wherever necessary.**
3. Mobiles, smart watches or any electronic gadgets are strictly banned.

Sl#	Question	Marks	Bloom's Level	CO Mapping																				
1	a. State Definite Clause and Horn Clause with an example and also mention their relevance in the inference process	05	Understand	CO2																				
	b. Apply the procedure to convert predicate calculus expression in clause form: $\forall (X)(R(X) \rightarrow \{\forall (Y)[P(Y) \rightarrow S(f(X, Y))] \wedge \neg \forall (Y)[S(X, Y) \rightarrow R(Y)]\})$	06	Apply	CO2																				
	c. Describe the differences and similarities between problem solving and planning. Use suitable example to support your answer.	04	Understand	CO3																				
2	a. Define the following terms as applied to predicate logic. Use suitable examples: 1. Quantifiers 2. Connection between the existential and universal quantifiers	04	Understand	CO2																				
	b. Discuss how you draw inference using full joint distribution focusing on the rules of conditioning and marginalization. Given the full joint distribution for the toothache, cavity and catch world:	05	Apply	CO3																				
	<table border="1"> <thead> <tr> <th></th><th colspan="2">Toothache</th><th colspan="2">¬toothache</th></tr> <tr> <th></th><th>Catch</th><th>¬catch</th><th>Catch</th><th>¬catch</th></tr> </thead> <tbody> <tr> <td>cavity</td><td>0.108</td><td>0.012</td><td>0.072</td><td>0.008</td></tr> <tr> <td>¬cavity</td><td>0.016</td><td>0.064</td><td>0.144</td><td>0.576</td></tr> </tbody> </table>		Toothache		¬toothache			Catch	¬catch	Catch	¬catch	cavity	0.108	0.012	0.072	0.008	¬cavity	0.016	0.064	0.144	0.576			
	Toothache		¬toothache																					
	Catch	¬catch	Catch	¬catch																				
cavity	0.108	0.012	0.072	0.008																				
¬cavity	0.016	0.064	0.144	0.576																				
	Calculate the following: 1. $P(\neg \text{toothache} \vee \text{cavity})$ 2. $P(\neg \text{cavity})$ 3. $P(\text{toothache} \mid \text{cavity} \vee \neg \text{catch})$ 4. $P(\text{cavity} \mid \text{toothache} \vee \text{catch})$.																							

	c. Illustrate problem decomposition into AND-OR graph with example.	06	Understand	CO2
3	a. Formulate the PDDL description of an air cargo transportation planning problem.	04	Apply	CO3
	b. Solve the below query using the answer extraction method: All people who are not poor and are smart are happy. Those people who read are smart. John can read and is not poor. Happy people have exciting lives. Can anyone be found with an exciting life?	07	Apply	CO2
	c. Describe generic knowledge based agent with pseudocode.	04	Understand	CO2

Course Outcomes meant to be assessed by the IA Test 2:

CO2: Demonstrate an understanding of knowledge based agents and various knowledge representation and inference techniques and analyze how a particular inference technique works on a problem specification. (PO-2,3,4,PSO-2)

CO3: Examine the various methods of handling uncertainty; planning and Machine learning techniques available and visualize their applicability in the real word problems. (PO-2, 3, 4, 5, 8, 9, 10, 12, PSO-2, 3)