Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

NAME OF THE SCHOOL
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2024-2025

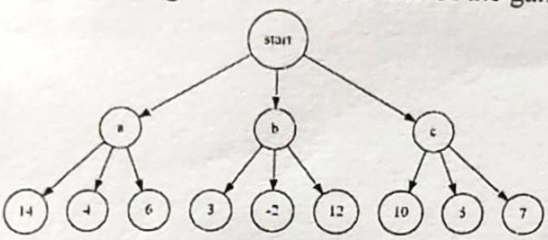
SLOT: E1+TE1

Programme Name & Branch	: B.Tech BCB, BCE, BCT, BCI, BDS, BKT
Course Code and Course Name	: BCSE306L – Artificial Intelligence
Faculty Name(s)	: Dr. Sunija. A. P
Class Number(s)	: ALL
Date of Examination	:17/10/2024
Exam Duration	: 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions

Q. No	Question	Marks
1	Consider a two-player turn-based strategy game where each player tries to maximize or minimize the game score at the end of the game. The game tree is given below  a) Apply the Minimax Algorithm to determine the optimal move for the Maximizer at the start node. Show all calculations for each node. b) Apply Alpha-Beta Pruning to the same game tree and show how it reduces the number of node evaluations. Explain which nodes were pruned and why.	10
2	Jake wants to be selected for a sports team. The selection criteria and Jake's circumstances are as follows: 1. Anyone fast or strong gets selected. 2. Training makes you fast. 3. Exercise makes you strong. 4. Jake trains but does not exercise. Convert the given scenario into propositional logic statements and use resolution to prove that "Jake gets selected."	10
3.	Consider the following set of rules for classifying transportation modes: 1. Vehicles that have engines are motorized. 2. Vehicles that run on tracks and carry passengers are trains. 3. Vehicles that are motorized and have two wheels are motorcycles. 4. Vehicles that have wings and fly are airplanes. 5. Vehicles that are motorized, have four wheels, and carry passengers are cars. The working memory contains the following assertions: A1: Speedster has two wheels. A2: Zoomer runs on tracks. A3: Gliders have wings. A4: Speedster has an engine. A5: Glider flies	5+5

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.:

NAME OF THE SCHOOL
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2024-2025

SLOT: E1+TE1

	i) Use forward chaining to derive assertion, "Speedster is a motorcycle" that are derivable from this knowledge base. ii) Use backward chaining to determine whether "Speedster is a motorcycle". Construct all trees showing the steps followed by forward and backward chaining.	
4.	Consider the following statements 1. Any book in the library is more expensive than any magazine in the store. 2. Any electric car is more efficient and produces less pollution than a gasoline car. 3. There is exactly one student whose GPA is 4.0. 4. There is a restaurant in Paris that serves better food than any other restaurant in the city. 5. A person who helps others is respected by everyone. a) Convert the following English statements into First-Order Logic (FOL) b) Convert the above FOL expressions to Conjunctive Normal Form (CNF).	5+5
5.	Consider the following dataset that includes demographic information and symptoms for disease diagnosis: a) Using the dataset provided, apply Naive Bayes Classification to predict the diagnosis of a new individual based on the following features: Age Group: 30-40, Gender: Female, Fever: Yes, Cough: Yes, Fatigue: Yes, Sore Throat: No b) Based on the data given, answer the following: i)What is the probability that an individual has a COVID-19 diagnosis given that they are Male and have Fatigue and Cough? ii) Given that an individual has No Fever and No Cough, what is the probability that their diagnosis is Healthy?	6+4

	Age Group	Gender	Fever	Cough	Fatigue	Sore Throat	Diagnosis
1	<30	Female	Yes	Yes	Yes	No	Flu
2	30-40	Male	Yes	Yes	No	Yes	COVID-19
3	>40	Female	No	Yes	Yes	Yes	Allergies
4	<30	Male	Yes	No	Yes	No	Flu
5	30-40	Female	Yes	Yes	Yes	Yes	COVID-19
6	>40	Male	No	No	No	No	Healthy
7	<30	Female	Yes	Yes	No	Yes	COVID-19
8	30-40	Male	Yes	No	Yes	Yes	Flu
9	>40	Female	Yes	Yes	Yes	Yes	COVID-19
10	30-40	Male	No	Yes	No	No	Allergies