VIT
Vellore Institute of Technology
CHENNAI

Reg. Number:	24MCA1034

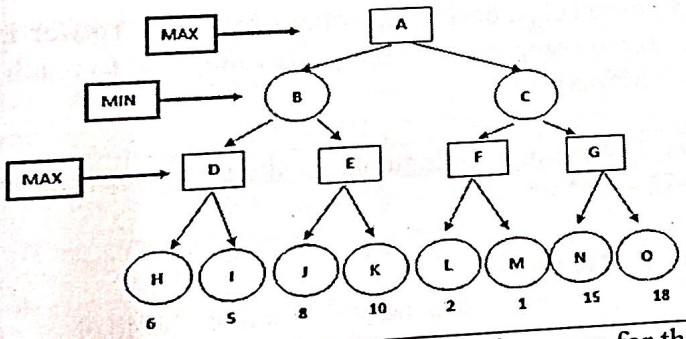
Continuous Assessment Test (CAT) – II March 2025

Programme	:	MCA	Semester	:	Winter Sem 24-25
Course Code & Course Title	:	PMCA611L – Artificial Intelligence	Class Number	:	CH2024250501750
Faculty	:	Dr.B.Saleena	Slot	:	F1+TF1
Duration	:	90 minutes	Max. Mark		50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.

Answer ALL the questions

Q. No	Sub Sec.	Description	Marks
1.		Consider the following game tree where the **Max** player is trying to maximize the score, and the **Min** player is trying to minimize the score. The values in the leaf nodes represent the evaluation of the terminal states. (i) Apply Alpha-Beta pruning technique to this game tree and illustrate the value of Alpha and Beta at every node. (8 Marks) (ii) What will be the final value selected by the **Max** player? (2 Marks) 	10
2.		A university needs to schedule a set of courses for the upcoming semester in such a way that no student faces a schedule conflict. The university has multiple professors and classrooms, each with limited seat, and each course has specific timing and location requirements. The goal is to assign time slots and classrooms to each course fulfilling all constraints, ensuring that there are no conflicts in the schedule, and optimizing for resource usage. (i) Identify what kind of problem does the above scenario belong to ? (2 Marks) (ii) List out the key components in the problem with an example. (8 Marks)	10

3.		Assume a Library Management System, which store the details of books, authors, library members, and their relationships. The system should include information such as book titles, publication years, author names, library member names and IDs, as well as details about the genres of the books. It also keep the record of books issued for the members. Represent the above knowledge using an OWL/XML ontology with the following details. (i) Identify all the classes involved in this system (2 Marks) (ii) Identify at least two object properties that define the relationships between the classes (4 Marks) (iii)Identify at least two data properties that define attributes of the classes (4 Marks)	10
4.		(i) Construct the propositional logic for the following statements (5 Marks) • If the internet is working, then the router is on. • If the router is on and the modem is connected, then the Wi-Fi will be available. • If the Wi-Fi is available, then the smart TV will connect to the internet. • If the smart TV connects to the internet, then streaming will work if and only if the app is updated. • The Wi-Fi is **not** available. • Either the modem is connected or the router is off. (ii) Using inference rules, derive the conclusion **"The router is off."** Illustrate the step-by-step application of the rules used to reach this conclusion. (5 Marks)	10
5.		Write the First Order Logic statements for the following English sentences (5 *2 =10 Marks) (i) Some cats are black. (ii) The library is open if and only if it is not a holiday. (iii) Every teacher teaches at least one subject. (iv) No one can borrow a book without a membership. (v) All books written by J.K. Rowling are fantasy books.	10

**********All the Best **********