

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2023

Subject Code:3154202

Date:07-12-2023

Subject Name: Fundamentals of Artificial Intelligence

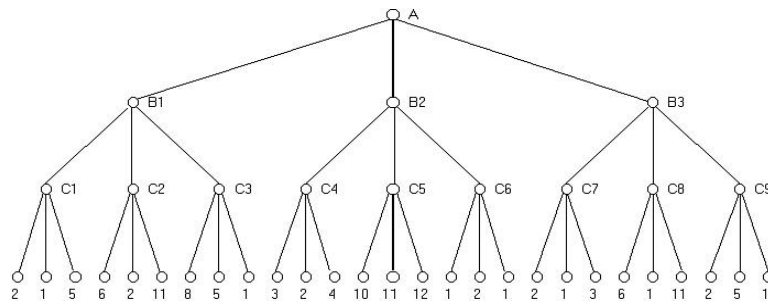
Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Differentiate Informed Search and Uninformed Search.	03
	(b) Explain the concept of rationality in AI agent decision-making.	04
	(c) Explain AO* Algorithm by Example.	07
Q.2	(a) Define 1) Universal Quantifier 2) Modus Ponus 3) Contradiction	03
	(b) Discuss Limitations of Hill Climbing Algorithm.	04
	(c)	07



Suppose in the above Example, the first player is the maximizing player. What next move should be chosen using the Minimax Algorithm?

OR

	(c) Explain Alpha Beta Pruning by Example.	07
Q.3	(a) Differentiate Forward Versus Backward Reasoning	03
	(b) Explain primitives of conceptual Dependency with Example.	04
	(c) John likes all kinds of food. Apple and vegetables are food. Anything anyone eats and not killed is food. Anil eats peanuts and still alive. Harry eats everything that Anil eats. John likes peanuts. John is Happy. Do Conversion of Facts into First Order Logic and then in CNF.	07

OR

Q.3	(a) Differentiate Procedural Versus Declarative Knowledge.	03
	(b) Discuss Bay's Theorem.	04
	(c) Explain Steps for Resolution in First order Logic.	07
Q.4	(a) The task is recognizing English alphabetical characters (F, E, X, Y, I, T) in an image processing system. Define two fuzzy sets $\tilde{I}$ and $\tilde{F}$ to represent the identification of characters I and F. $\tilde{I} = \{(F, 0.2), (E, 0.3), (X, 0.2), (Y, 0.1), (I, 0.7), (T, 0.5)\}$ $\tilde{F} = \{(F, 0.9), (E, 0.5), (X, 0.1), (Y, 0.2), (I, 0.5), (T, 0.5)\}$ Find $\tilde{I} \cup \tilde{F}$.	03

	(b)	Differentiate Supervised Learning and Unsupervised Learning.	04
	(c)	Describe the Methods to remove the over-fitting problem	07
	OR		
Q.4	(a)	Explain basic operations on fuzzy relations.	03
	(b)	Explain collaborative filtering as a recommendation system technique.	04
	(c)	Discuss the criteria for splitting nodes in a decision tree and their purposes.	07
Q.5	(a)	Describe the field of Sentiment Analysis in Natural Language Processing.	03
	(b)	Define 1) Activation Function 2) Learning Rate 3) Biases 4) Dropout Probability	04
	(c)	Explain the Back-propagation Algorithm of Neural Networks.	07
	OR		
Q.5	(a)	Discuss the K-fold cross-validation method with a suitable Example.	03
	(b)	Explain Linear Regression using Example.	04
	(c)	Describe various phases of Natural Language Processing.	07
