Total number of printed pages: 10 **Programme(UG)/5th/UCSE513 (comp.)**

2024

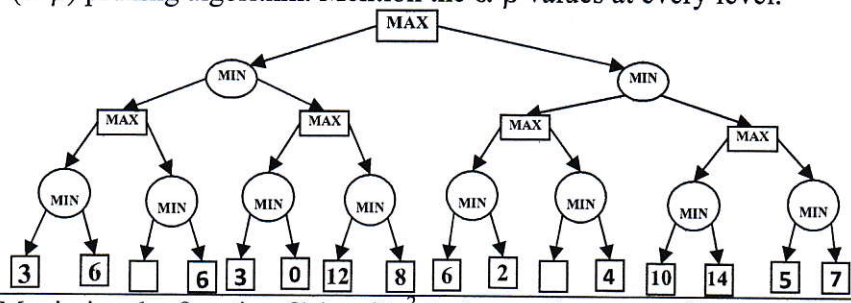
ARTIFICIAL INTELLIGENCE

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	What should Computer possess for acting as humanly?	6
	b)	What is Perception and Action? Explain the Perception and Action cycle.	8
	c)	Explain the state space graph with an example.	6
2.	a)	Write down the steps of Defth First Branch and Bound (DFBB) algorithm.	10
	b)	Mention the role of heuristic function in the A* algorithm.	4
	c)	Apply the AO* algorithm for Solving the Matrix Multiplication problem using the dimension of matrices A_1 =5*7, A_2=7*4, A_3 =4*6.	6
3.	a)	Evaluate the MAX (α-value) from the given below figure using alpha-beta (α-β) pruning algorithm. Mention the α-β values at every level. 	8
	b)	Maximize the function f(x) = ($3x^2$ + x) over the range of integers from 0...7. Apply a genetic algorithm to solve this problem. Show at least the possible solution (i.e. near to termination criteria). *(Note: x represent five-digit unsigned binary integers, f(x) value itself a fitness solution, Coding in binary form having 3-bit string length (represent 8 numbers, Four chromosomes (100, 101, 011, 110) as initial populations, Decode individual for further evaluation (like fitness i.e. ($3x^2$+x) (101=5; $3*5^2$+5=80), probability, random number, crossover and mutation).*	12
4.	a)	What is the purpose to apply genetic algorithm?	3
	b)	What are the key steps of genetic algorithm?	8
	c)	Why hill climbing search is in the category of local search algorithm?	3
	d)	What are the limitations of hill climbing search?	6
5.	Write short notes on the following (***any four***):		4x5=20

	a)	Backpropagation Neural Network	
	b)	Breadth first search	
	c)	Propositional logic	
	d)	Best first search	
	e)	Quantifiers of predicate logic	
6.	Differentiate between the following (***any four***):		4x5=20
	a)	OPEN and CLOSED Lists	
	b)	AND and OR node (AO* Algorithm)	
	c)	Iterative Deepening and Decision tree	
	d)	Propositional logic and Predicate logic	
	e)	Forward chaining and Backward chaining	