GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2022
ARTIFICIAL INTELLIGENCE
MCA20-302

TIME ALLOTTED: 3 Hours **FULL MARKS: 70**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP – A
(Multiple Choice Type Questions)

Answer any ***ten*** from the following, choosing the correct alternative of each question: **10×1=10**

			Marks	CO No
1.	(i)	Which is not a pure Ai game? a) Ludo b) Snakes and Ladders c) Tic-Tac-Toe d) Chess	1	CO2
	(ii)	Which of the following is there in Propositional logic? a) Existential quantifier b) Universal quantifier c) Conjunction d) Quantifier	1	CO3
	(iii)	Which of the following is a component of Artificial Intelligence? a) Learning b) Training c) Designing d) Puzzling	1	CO5
	(iv)	A. Knowledge base (KB) is consists of set of statements. B. Inference is deriving a new sentence from the KB. Choose the correct option. a) A is true, B is true b) A is false, B is false c) A is true, B is false d) A is false, B is true	1	CO3
	(v)	What is the general term of Blind searching? a) Informed Search b) Uninformed Search c) Informed & Unformed Search d) Heuristic Search	1	CO2
	(vi)	Which is not heuristic search? a) AO* b) A* c) Fuzzy Logic d) DFS	1	CO1

(vii)	Which of the following is not a type of Artificial Intelligence agent? a) Learning AI agent b) Goal-based AI agent c) Simple reflex AI agent d) Unity-based AI agent	1	CO1
(viii)	The total number of logical symbols in AI are _____ a) There are 3 logical symbols b) There are 5 logical symbols c) Number of logical symbols are based on the input d) Logical symbols are not used	1	CO3
(ix)	Which of the given language is not commonly used for AI? a) LISP b) PROLOG c) Python d) Perl	1	CO3
(x)	Heuristic search has a) Minimization of function values b) maximization of function values c) Both (A) and (B) d) None of these	1	CO1
(xi)	The process of capturing the inference process as Single Inference Rule is known as: a) Clauses b) Ponens c) Generalized Modus Ponens d) Variables	1	CO3
(xii)	Who is known as the -Father of AI"? a) Fisher Ada b) Alan Turing c) John McCarthy d) Allen Newell	1	CO1

GROUP – B
(Short Answer Type Questions)

Answer any ***three*** from the following: **3×5=15**

			Marks	**CO No**
2.	(a)	What is Artificial Intelligence?	2	CO1
	(b)	Discuss some early works in the domain of Artificial Intelligence.	2	CO1
	(c)	What are the modern application areas of Artificial Intelligence?	1	CO1
3.	(a)	What is State and State space?	2	CO2
	(b)	Design the state space up to two levels after the initial state of the game Tic-Tac-Toe.	3	CO2
4.	(a)	What are the drawbacks of Hill climbing method? How to remove them?	5	CO1
5.	(a)	What is a Well-Formed Formula? Give suitable examples.	2	CO4
	(b)	Briefly discuss the universal and existential quantifiers and their uses.	3	CO4

6.	(a)	What is Minimax algorithm?	3	CO3
	(b)	What is heuristic search?	2	CO2

GROUP – C
(Long Answer Type Questions)
Answer any ***three*** from the following: **3×15=45**

			Marks	CO No
7.	(a)	You are given two jugs, a 4-gallon one and a 3-gallon one. Neither has any measuring markers on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug? Write down the production rules and control strategy.	7	CO1
	(b)	Consider the game tic-tac-toe..MAX gives cross(X) and MIN gives circle (O). Assume MAX will give first move. Draw the game tree (considering the winning strategy of MAX).	8	CO2
8.	(a)	Using the resolution principle consider the following sentences: John likes all kinds of food. Apples are food. Anything anyone eats and is not killed by is food. Mary eats peanuts and is still alive. Sam eats everything Mary eats. Use resolution to answer, "What food does Sam eat?"	6	CO3
	(b)	Write the steps of writing a sentence into clause form.	6	CO3
	(c)	Compare between heuristic & non-heuristic search.	3	CO2
9.	(a)	What is the classification of grammar introduced by Chomsky?	6	CO4
	(b)	Differentiate – Top-down and Bottom-up Parsing methods.	5	CO4
	(c)	What is the importance of syntax and semantics in Natural Language?	4	CO4
10.	(a)	What is Forward and Backward Reasoning?	4	CO2
	(b)	What is Modus Ponens and Modus Tollens	4	CO2
	(c)	Compare BFS and DFS .	4	CO2
	(d)	'A game tree is basically an AND/OR graph'-Justify.	3	CO3
11.		Write short notes on any three of the following.		
	(a)	Alpha-beta pruning	5	CO5
	(b)	Natural Language Processing	5	CO4
	(c)	Supervised Vs. Un-supervised Learning	5	CO5
	(d)	Artificially Intelligent Agent	5	CO1
	(e)	Expert System	5	CO5