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RV COLLEGE OF ENGINEERING®
(An Autonomous Institution affiliated to VTU)
V Semester B. E. Fast Track Examinations Oct-2020
Computer Science and Engineering
ARTIFICIAL INTELLIGENCE (ELECTIVE)

Time: 03 Hours   *Maximum Marks: 100*
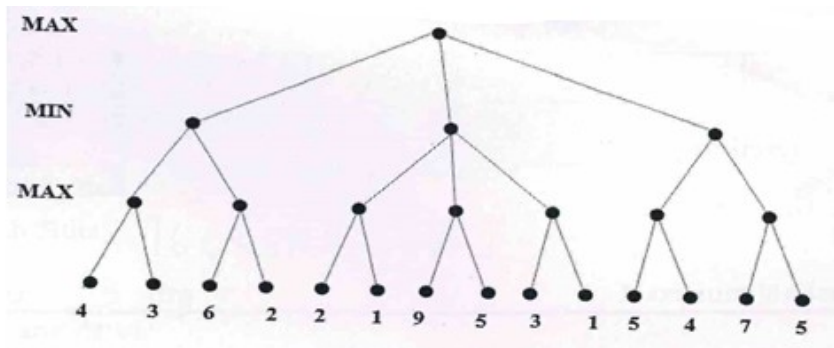***Instructions to candidates:***
1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2, 7 and 8 are compulsory. Answer any one full question from 3 and 4 & one full question from 5 and 6

PART-A

1	1.1	_____ is responsible for implementing knowledge in a program that is effective and exhibit intelligent behavior.	01
	1.2	_____ is the strategy for selectively searching a problem space.	01
	1.3	Give the definitions of artificial intelligence that acts rationally.	02
	1.4	An atomic sentence is a _____ of arity n.	01
	1.5	For the substitution sets $\{X/Y, W/Z\}, \{V/X\}$ and $\{a/V, f(b)/W\}$, the equivalent composition of unification substitution is:	01
	1.6	Give the principle of working of Breadth first search on a graph.	02
	1.7	The above pruning algorithm in game playing expresses a relation between nodes at ply n and at ply _____ under which entire sub trees rooted at level _____ can be eliminated from consideration	02
	1.8	Write the pseudo code for depth-limited search	02
	1.9	Define Baye's rule.	02
	1.10	List and give the purpose of different forms of learning.	02
	1.11	If the evaluation function $f(n) = g(n) + h(n)$ is used with the best first search algorithm, the result is _____.	01
	1.12	_____ reasoning, the explanation available to the user at any time in the search is quite limited.	01
	1.13	_____ and _____ often are called unconditioned probability and conditional probability respectively.	01
	1.14	_____ reasoning is based on probability theory and is used extensively in applications of pattern recognition and classification.	01

PART-B

2	a	Differentiate between simple reflex agent and model based reflex agent.	08
	b	Explain sliding block problem with necessary steps and diagram.	08
3	a	Discuss genetic algorithm with its pseudo code.	08
	b	Solve erratic vacuum word problem with necessary steps.	08

OR

4	a	Apply Alpha-Beta Pruning on the following tree.	
			08
	b	Discuss backtracking search for *CSPs* with its pseudo code.	08
5	a	Propose *AI* method to solve Wumpus world problem with suitable diagrams.	08
	b	Explain forward and backward chaining with its pseudo code.	08

OR

6	a	Translate the following into predicate logic. • "Every house is a physical object" • "Some physical objects are houses" • "Every house has an owner" or, equivalently " every house is owned by somebody" • "somebody does not own a house"	08
	b	Solve the problem using resolution technique. "Everyone who loves all animals is loved by someone"	08
7	a	Write decision tree algorithm and illustrate with an example.	08
	b	Explain ensemble learning with a neat diagram.	08

8	a						

	toothache		$\neg$*toothache*	
	catch	$\neg$*catch*	*catch*	$\neg$*catch*
cavity	0.108	0.012	0.072	0.008
$\neg$*cavity*	0.016	0.064	0.144	0.576
A full joint distribution for the Toothache, Cavity, Catch world				

Find the following using the above data:
- P(cavity V toothache)
- P(cavity)
- P(cavity | toothache)
- $P(\neg$ cavity | toothache)

08

	b	Explain the application of Bayesian network with necessary steps, used to construct the Bayesian network.	08