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APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER

Q. P. Code : 1EA171 **(Pages:3)** **Name** .....

Reg. No: .....

FIRST SEMESTER M.TECH. DEGREE EXAMINATION December 2017

Branch: Computer Science **Specialization: Computer Science and Engineering**

08 CS 6051 (A) COMPUTATIONAL INTELLIGENCE

Time:3 hours **Max.marks: 60**

Answer all six questions.

Modules 1 to 6: Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q.no.	Module 1	Marks
1.a	List the criteria to measure the performance of different search strategies	3
	Answer b or c	
b	A farmer with a wolf, a goat, and a container of cabbage are on the west bank of the river. On the river is a boat in which the farmer and one of the other three (wolf, goat, or cabbage) can fit. If the wolf is left alone with the goat, the wolf will eat the goat. If the goat is left alone with the container of cabbage, the goat will eat the cabbage. Your goal is to transfer everyone to the other side of the river safely. Solve this problem using depth first search	6
c	Represent the following statements in predicate calculus i. Everyone who loves all animals is loved by someone ii. Spaniels are good dogs and so are trained collies. iii. Some birds are crows but no birds are squirrels	6

Q.no.	Module 2	Marks
2.a	Give some of the application domains where the agent based problem solving is appropriate	3
	Answer b or c	

b	Discuss about semantic net. Draw the semantic net for the following sentences i. John give the book to Mary ii. I own a tan leather chair	**6**
c	Describe in detail about admissibility, monotonocity and informedness with the help of algorithms.	**6**

Q.no.	**Module 3**	**Marks**
3.a	Consider two perceptrons A and B defined by the threshold expression $w_0 + w_1x_1 + w_2x_2 > 0$. Perceptron A has weight values w_0=1, w_1=2, w_2=1 and perceptron B has weight values w_0=0, w_1=2, w_2=1. Is perceptron A more_general_than perceptron B? A is more_general_than B if and only if $\forall$ instance , $< x_1, x_2 >, B(< x_1, x_2 >) = 1 \rightarrow A(< x_1, x_2 >) = 1$.	**3**
	Answer b or c	
b	Explain ID3 decision tree algorithm. Illustrate it with an example.	**6**
c	With the help of diagram, explain the training algorithm of Back propagation networks and discuss how the various parameters are chosen for training the neural net?	**6**

Q.no.	**Module 4**	**Marks**
4.a	Write the general form of the genetic algorithm	**3**
	Answer b or c	
b	All people who are not poor and are smart are happy. Those people who read are not stupid. John can read and is wealthy. Happy people have exciting lives. Can anyone be found with an exciting life? Prove by resolution.	**6**
c	List the advantages and limitations of Genetic Algorithm. State the taxonomy of the crossover operator.	**6**

Q.no.	**Module 5**	**Marks**
5.a	How phrase structure ambiguity affects NLP? Illustrate possible phrase structures for the sentence: "John saw the man on the mountain with a telescope"	**4**
	Answer b or c	
b	How does an expert system help in solving complex problems? What kind of mistakes might ES make and why? Why is it easier to correct mistakes in ES than in conventional programs?	**8**
c	Give the technical details of any real time expert system with its architecture and its implementation.	**8**

Q.no.	Module 6	Marks
6.a	Explain the use of cut to control search in PROLOG with an example	4
	Answer b or c	
b	Write a function called *censor-word*, which takes a symbol and list. It returns a list in which all occurrences of the symbol have been replaced by *XXX*. The function must be written recursively and cannot make use of any of Lisp's higher-order functions such as *mapcar*. The function only has to traverse the "top-level" of the list.	8
c	Explain the Abstract Data Types used in PROLOG.	8