

23074

M. Tech. 3rd Sem. (Computer Engg.) Examination–May, 2015

KNOWLEDGE BASED SYSTEM DESIGN

Paper : MTCE-701-A

Time : 3 hours

Max. Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt any **five** questions. All questions carry equal marks.

1. (a) Write a critical note on "Turning test".
(b) What is state space representation ?
Represent the following in state space representation :
"Replacing Damaged RAM of your PC".
2. (a) Differentiate between blind search and heuristic search. Write an algorithm for BFS. Also calculate its time and space complexity.

23074-550-(P-4)(Q-8)(15) (1)

[Turn Over

- (b) What are the limitations of hill climbing search ? Explain with suitable example.

3. (a) What are the limitations of truth table method of reasoning ? How does a semantic tableau remove the limitation of truth table ? Also explain this method.

- (b) Are the following arguments valid ? Prove using semantic tableau.

"If Sam lives in Delhi, he lives in Haryana. Sam lives in Delhi. Therefore Sam lives in Haryana." <http://www.HaryanaPapers.com>

4. (a) Express the wff $(r P1 \wedge (r P2 \rightarrow P3)) \leftrightarrow P4$ in CNF.

- (b) Convert the following statements into Predicate logic form.

(i) If Sam practices he will win

(ii) All grass is green

(iii) No integer is even and odd.

(iv) Sam's father likes Music.

- (c) What is the relationship between $\exists$ and $\forall$?

- (d) What do you mean by scope and binding of a quantifier ?

23074-550-(P-4)(Q-8)(15) (2)

5. (a) Prove $(\forall x)A(x) \vee (\forall x)B(x) \rightarrow (\forall x)(A(x) \vee B(x))$ using Semantic Tableaux method in Predicate Logic.
- (b) What is Prenex Normal form ? Convert the following into Prenex Normal form $(\exists x) A(x) \rightarrow (\forall x) B(x)$.
- (c) Explain and define Skolemisation by giving suitable example.
6. (a) Discuss various components and types of Agent.
- (b) State and prove Baye's theorem. Also write the theorem for multiple evidence and multiple hypotheses.
7. (a) Discuss various membership functions in fuzzy logic.
- (b) What are different limitations of Bayes theory and conventional probability theory and how can these limitations be solved using Dempster-Shafer Theory. Also state this theory.

8. Write short notes on the following "differences between" :

- (a) Fuzzy theory and probability theory
- (b) Rule and Frame Based Expert system
- (c) Forward and Backward Chaining

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