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4E2923

B. Tech. (Sem. IV) (Main/Back) Examination, June/July - 2012
Computer Engg. & I.T.
4IT6.3 - Logic & Functional Programming

Time : **3** Hours]

[Total Marks : **80**
[Min. Passing Marks : **24**

*Attempt any **five** questions, selecting **one question** from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*
Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. _____ **Nil** _____   2. _____ **Nil** _____

UNIT - I

1   Evaluate each prepositions given below into states given below -

$$S_1 = \{(P,T),(q,F),(r,F)\}$$
$$S_2 = \{(P,F),(q,F,),(r,T)\}$$

(a) $P \wedge q \Rightarrow r$

(b) $P \Rightarrow q \Leftrightarrow r$

(c) $(P \vee q) \wedge (p \Rightarrow q) \wedge (q \Rightarrow p)$

(d) $P \vee q \wedge r$

$4 \times 4 = 16$

OR

1   (a)   Explain "well formed formula" wff. Give truth table of logical operators in prepositions.

8

(b)   What do you mean by proposition, tautology, contradiction and contingency ?

$2+2+2+2=8$

UNIT - II

2   (a)   What is the syntatic form and usage of fact and rule statements in prolog.

              8

    (b)   Explain merits and demerits of prolog ?

              8

OR

2   (a)   Explain how a query is processed in prolog ?

              8

    (b)   Explain strength, application and weakness of prolog ?

              8

UNIT - III

3   (a)   What are the data structure in prolog ?

              8

    (b)   Write the difference between DFS and DFID ?

              8

OR

3   (a)   Explain the representation and implementation of state space in prolog ?

              8

    (b)   Explain the following predicates with suitable example :
        (i)   CUT predicate
        (ii) Fail predicate
        (iii) NOT predicate

              8

UNIT - IV

4   (a)   Give comparison between functional and imperative language.

              8

    (b)   Explain α, β and η conversions with example.

              8

OR

4 (a) Explain different functional forms.

8

(b) What is Lambda calculus and explain syntax and semanatics of Lambda calculus ?

8

UNIT - V

5 (a) What is Haskell ? Why Haskell is called functional language? How it is different from other programming language ?

10

(b) Explain Basic INPUT / OUTPUT functions in Haskell.

6

OR

5 (a) Write program in Haskell using structure.

10

(b) Write program in Haskell using type classes.

6