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2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS

THEORY OF COMPUTATIONS

(INFORMATION TEHNOLOGY)

NOVEMBER/DECEMBER 2005

TIME – 3 HOUR
MARK - 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Differentiate NFA and DFA with respected to transition and acceptance.

(b) Draw DFA which accepts even number of a's over the alphabet {a, b}

(c) Construct DFA equivalent to the following Finite state machine. Figure 1 [5+5+6]

2. (a) Construct the Moose machine for Figure 2 Melay machine.

(b) Minimize the Finite automation Figure 3 below and show both the given and the reduced one are equivalent. [6+10]

*3. (a) Construct the NFA for the regular expression r = 0*1 ((0+1)0*1)* (2+(0+1) (00)*)+0(00)**

(b) Consider the FA and construct regular expressions that is accepted by it. [8+8]

4. (a) Construct left linear and right linear grammar for the regular expression. 0(1(0+1))**

(b) Give the CFG to generating the following sets The set of all strings over alphabet {a, b} with exactly twice as many a's as b's. [8+8]

5. (a) Design a PDA which accepts all strings which can be derived from the following Grammar. Taking a suitable example verify the machine.

S ! aB/bA A ! a/aS/bAA B ! b/bS/Abb

(b) Prove that acceptance by empty stack and by final state is equivalent. [8+8]

6. (a) Explain the procedure involved in the design of Turing Machine.

(b) Design Turing Machine to recognize the following.

i. To find out proper substraction of two integers.

ii. To recognize L = L(0 1).* [4+12]

7. (a) Discuss different languages and their corresponding machines.

(b) Write the design procedure of shift reduce parser by taking a suitable example [8+8]

8. (a) Explain Rice's theorem for undecidable problems.

(b) List the problems that are decidable for DCFL's. [8+8]