Code :RR310504

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III B.Tech I Semester(RR) Supplementary Examinations, May 2011
THEORY OF COMPUTATION
(Computer Science & Engineering, Computer Science & Systems Engineering)

Time: 3 hours   **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks
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1. For the NFA given by following state transition diagram Figure 1

    (a) check whether the string abbabba is accepted or not

    (b) Give at least two transition paths.

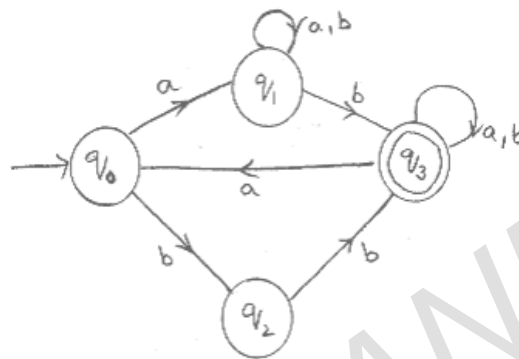   (c) Find equivalent DFA. Check for same result of bit (a).

Figure 1:

2. (a) Construct the Moore machine for given Melay machine.

q_i	a=0		a=1	
	q_i+1	output	q_i+1	Output
q_1	q_i	1	q_2	0
q_2	q_4	1	q_4	1
q_3	q_2	1	q_3	1
q_4	q_3	0	q_1	1

    (b) Minimise the Finite automation given below and show that both the given and reduced one are equivalent.

α	a	B	Output
q_0	q_1	Q_2	0
q_1	q_2	Q_3	0
q_2	q_3	Q_4	1
q_3	q_4	Q_4	0
q_4	q_0	Q_0	0

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

    (b) Consider the FA and construct regular expressions that is accepted by it. Figure 2
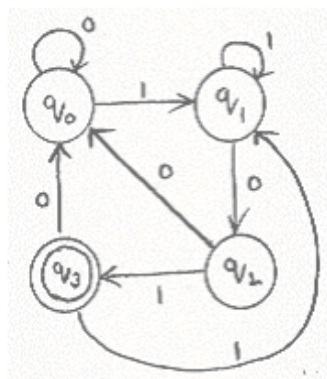

Figure 2:

4. (a) Construct left linear and right linear grammar for the regular expression.
$(0/1)^*00(0/1)^*$

   (b) What is meant by ambiguous grammar? Test whether the grammar is ambiguous or not. $S \rightarrow aSb/a\,aSb/^\wedge$

5. (a) Convert the following GNF
   S $\rightarrow$ aA/B/C/a
   A $\rightarrow$ aB / $\in$
   B $\rightarrow$ aA
   C $\rightarrow$ cCD
   D $\rightarrow$ abd.

   (b) Construct CFG generating the set of all strings over $\{a, b\}$ consisting of equal no of a's and b's.

6. (a) Why the Languages accepted by Turing machine are called "recursively enumerable languages". Explain atleast two properties of r.e. languages.

   (b) Design Turing machine to find square of a given integer.

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

   (b) Write the design procedure of shift reduce parser by taking a suitable example.

8. Write short notes on:

   (a) Undecidability

   (b) PCP

   (c) Turing reducability.

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