

IT - 713**B.E. VII Semester**

Examination, December 2015

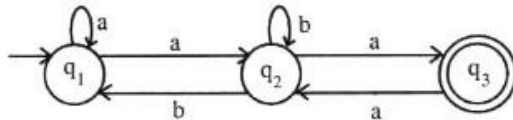
Automata and Compiler Design**Time : Three Hours****Maximum Marks : 70**

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each question are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
 iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What are the applications of FA?
 b) Construct a DFA that accept the set of all strings ending with 111 over alphabet {0, 1}.
 c) Write the identity rules for regular expression.
 d) Give regular expressions for the following over {a, b}
 - i) Each string starts and ends with same symbol.
 - ii) Length of the strings is atleast three.
 - iii) The number of b's is exactly two.

OR

Construct the regular expression for the DFA shown in fig.



2. a) Explain parser tree with example.
 b) Write a short note on context free grammar.
 c) Give a brief description about LEX.
 d) Verify whether the following grammar is LL(1) or not
 $S \rightarrow iEtSS'/a$
 $S' \rightarrow es/\wedge$
 $E \rightarrow b$

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OR

Check whether the following grammar is LL(1).

 $S \rightarrow AaAb/BbBa$ $A \rightarrow \wedge$ $B \rightarrow \wedge$

3. a) Give the parse tree and translations for the expression $(4*7+19)*2$ according to syntax directed translation.
 b) What is the significance of syntax directed definition?
 c) Compare SLR, canonical LR, LALR.
 d) Translate the expression $(a+b)*(c+d) + (a+b+c)$ into
 - i) Quadruples
 - ii) Tripes
 - iii) Indirect tribles

OR

Construct LALR parsing table for the following grammar

 $S \rightarrow Aa/bAc/dc/bda$ $A \rightarrow d$

4. a) What is an activation tree?
 b) Explain syntactic phase error.
 c) Explain static scoping and dynamic scoping.
 d) Compare and contrast various allocation strategies.

OR

Explain error detection and recovery.

5. a) Write a brief note on peephole optimization.
 b) Explain data flow analysis of flow graphs.
 c) Explain register allocation and assignment.
 d) Describe various machine independent code optimization techniques.

OR

Describe the various issue in the design of a code generator.
