

R09

Code No: 54055

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2016  
FORMAL LANGUAGES AND AUTOMATA THEORY

(Computer Science and Engineering)

Time: 3 hours

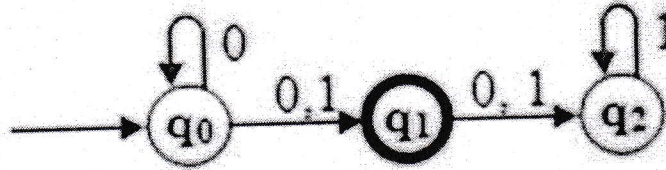
Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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1. Write DFA to accept strings of 0's, 1's and 2's beginning with a 0 followed by odd number of 1's and ending with a 2. [15]

2. Convert the following NFA into an equivalent DFA. [15]



- 3.a) What is regular grammar? How to convert left linear grammar into right linear grammars?

- b) Derive left and right most derivations for the input string  $a=b*c+d/e$  for the given grammar  $E \rightarrow E+E | E-E | E*E$   $E \rightarrow E/E$   $E \rightarrow (E)id$ . [8+7]

- 4.a) Explain the algebraic laws of regular expressions.

- b) Explain the procedure for the conversion of DFA into regular expression like  $(110)^*110(110)^*$  over an alphabet  $\{0,1\}$ . [8+7]

- 5.a) Differentiate Chomsky and Greibach Normal forms.

- b) Convert the following grammar G into CNF  
 $S \rightarrow aAD$   $A \rightarrow aB|bAB$   $B \rightarrow b$   $D \rightarrow d$ . [7+8]

- 6.a) Construct PDA to accept if-else of a C program and convert it to CFG.  
(This does not accept if-else-else statements)

- b) Design a PDA to accept the set of all strings of 0's and 1's such that no prefix has more 1's than 0's. [8+7]

- 7.a) List and explain Types of Turing machines used for computable functions.

- b) Discuss in detail about unrestricted grammars. [8+7]

8. What is Context-sensitive language? How Linear Bounded Automata is related with it? Explain. [15]

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