R09

Code No: 54055

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, November/December - 2015

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.a) Define the following terms with an example for each
i) Transition Table ii) Transition Diagram iii) Power set iv) Language.
b) Design a NFA for the following
i) L={ abaa^n/ n>1 }
ii) To accept language of all strings with 2 a's followed by 2 b's over {a , b} [7+8]

2.a) Construct a DFA that accepts all strings consisting of even number of a's and even number of b's?
b) Find the minimal DFA accepting a set of all strings over{0,1}that do not contain 101 as a sub string? [7+8]

3.a) Prove that every language defined by a Regular expression is also defined by Finite automata?
b) Define regular expression and find regular expression for the following:
L={w | every odd position of w is a 1} defined over $\sum$= {0,1}? [7+8]

4.a) Discuss about:
i) Context Free Grammar ii) Left most derivation
iii) Right most derivation iv) Derivation tree.
b) Describe the language of the following grammar
S →A1B A →00A|Λ B →000B|Λ Also find whether the language is regular or not? [8+7]

5.a) What is CNF? Convert the following grammar into CNF S→ABa A→aab B→Ac.
b) What is Greibach normal form? Explain it with an example. [8+7]

6. Discuss in detail about DCFL and DPDA. [15]

7.a) What is Turing Machine and Multi tape Turing Machine? Show that the language accepted by these machines are same.
b) Describe the TM that accepts the language
L = {w ε{a,b,c} | w contains equal number of a's, b's, and c's}. [8+7]

8.a) Write short notes on Post Correspondence problem.
b) Construct LR(0) items for the grammar given find it's equivalent NFA S→aSA | b A→Ab/a. [7+8]

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