Code No: 114AG **R13**

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**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART - A **(25 Marks)**

1.a)	Define a non-deterministic model with example.	[2]
b)	State and explain Moors Machine.	[3]
c)	Give an example to explain the concept of regular set.	[2]
d)	Discuss about right linear and left linear grammars.	[3]
e)	Give an example for context free language.	[2]
f)	Write a context free grammar for the language $\{0^n1^n /n>=1\}$.	[3]
g)	When do you say that the Turing machine accepts a string.	[2]
h)	What are the components of a Turing machine?	[3]
i)	State and explain universal Turing machine.	[2]
j)	Give an example to explain NP hard and NP Complete problems.	[3]

PART - B **(50 Marks)**

2. Define DFA and Regular expression. DFA accepts all strings corresponding to the expression 1*01(0+11)*. Also explain how to convert a regular expression to DFA. [10]

OR

3. Convert the following regular expressions to NFA with epsilon transitions
a) 0*+1101 b) (0+1)* [5+5]

4. Show that if L is regular grammar the L is a regular set. [10]

OR

5. Explain various components of context free grammar and derivation tree in detail. [10]

6. When do you say a language L is unambiguous? Show that the language $L=\{a^nb^n|n>=1\}$ is unambiguous. [10]

OR

7. Show that the L is context free language, then there exists a Push down automata M such that L=N(M). [10]

8. Show that any non-trivial property of the recursively enumerable language is undecidable? [10]

OR

9. Design a Turing machine to accept the set of all palindrome over {0,1}*. Draw a transition diagram for the Turing machine of the above. [10]

10. State and explain in detail about P and NP problems. [10]

OR

11. Explain what undecidable problem is and post correspondence problem? [10]

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