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Code No: 5458AQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech II Semester Examinations, June/July - 2018

THEORY OF COMPUTATION

(Computer Science and Engineering)

Time: 3hrs **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

5 × 5 Marks = 25

1.a) State and explain a non-deterministic model with example. [5]
b) Write a context free grammar for the language $\{0^n1^n /n>=1\}$. [5]
c) Discuss the variants of Turing machines. [5]
d) Show how the halting method is undecidable. [5]
e) Write a short notes on complexity relationship among models. [5]

PART – B

5 × 10 Marks = 50

2. Construct a 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. [10]

OR

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

4. Convert the following grammar G into CNF: [10]
S->aAD A->aB|bAB B->b D->d

OR

5. Construct PDA to accept if-else of a C program and convert it to CFG.
(This does not accept if –if –else-else statements) [10]

6. Show that L is recognized by a Turing machine with a two way infinite tape if and only if it is recognized by a Turing machine with a one way infinite tape. [10]

OR

7. Define Turing Machine and design it to recognize the language $L = \{0^n1^n \mid n>=1\}$. Illustrate the action of Turing machine in accepting the word 0^31^3. [10]

8. Explain the Decidable problems concerning to context-free languages. [10]

OR

9. What is mapping reducibility? Explain the process to perform it. [10]

10. State and explain in detail about Cook-Levin Theorem. [10]

OR

11. Give an example to explain the Hamiltonian path problem in detail. [10]

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