SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
Hanuman Vyayam Prasarak Mandals's
College of Engineering & Technology, Amravati
Course: Information Technology
BE Four year Semester (Information technology) Summer 2020 Exam
Subject: 6IT03 Theory of Computation
Assignment for ONLY BACKLOG STUDENTS

_____

Instructions

1) **Solve ANY TWO Questions**
2) **Each Question Carries 10 marks**

QI) Solve the following

1) Construct DFA accepting following languages over alphabet {0, 1}
    i) The set of all strings ending in "00"   [2M]

2) Using Pumping Lemma show that following Languages are not regular
    i) L={$0^n 1^n$/n>=1}   [2M]

3) Convert following CFG into GNF
            S →bB/abB
            A →aab
            B →bbA   [2M]

4) A turing machine with several tapes in known as:
a) Multi-tape turing machine
b) Poly-tape turing maching
c) Universal turing machine
d) All of the mentioned   [1M]

5) Define context sensitive grammar with example.   [2M]

6) Show that complement of recursive language is recursive only Diagram.   [1M]
    [2M]

Q II) Solve the following

1) Construct DFA accepting following languages over alphabet {0, 1}
     i) The set of all strings those containing the substring "001"   [2M]

2) Using Pumping Lemma show that following Languages are not regular
     i) L={WW^R/W€(a,b)*}   [2M]

3) Let G be the grammar
        S →aB/bA
        A →a/aS/bAA
        B →b/bS/Abb
For the string **bbaaba**,
Find
i) Leftmost Derivation   ii) Rightmost Derivation   [2M]

4) Explain Counter Machine.   [2M]

5) Give Context sensitive grammar for L={$a^n b^n c^n$ | n>=0} only Productions.   [1M]

6) Language is said to be CSL
a) If there exist context free grammar
b) If there exist regular grammar
c) If there exist context sensitive grammar
d) All of the above   [1M]

QIII) Solve the following

1) Define Deterministic Finite Automata and construct DFA which will accept all numbers divisible by 3.   [2M]
2) Construct Finite Automata for 011*+110   [2M]
3) Design a PDA for accepting language   L={$a^n b^{2n}$/n>=1}   [2M]
4) Construct turing machine for Addition   [2M]
5) Explain Chomsky Hiararchy only Diagram   [1M]
6) Show that Union of two recursive languages is also recursive only Diagram   [1M]

QIV) Solve the following

1) Convert the following NFA into its Equivalent DFA.

Q\Σ	0	1
→ q_0	{q_0, q_1}	q_0
q_1	q_2	q_1
q_2	q_3	q_3
ⓠ$_3$	-	q_2

[2M]

2) Convert the following RLG into equivalent LLG

   S →0A/1B
   A →0C/1A/0
   B →1B/1A/1
   C →0/0A   [2M]

3) Convert following CFG into CNF

   S →AB/aB
   A →aab/€
   B →bbA/€   [2M]

4) Construct Turing machine for Proper Substraction.   [2M]

5) Construct LBA for the language

 L={a^n! Where n>=0}   [1M]

6) Give the recursive definitions for

 i) Addition   [1M]