Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

[Total No. of Questions: 09]
Uni. Roll No. .....

[Total No. of Pages: 02]

MORNING
09 MAY 2023

Program: B.Tech. (Batch 2018 onward)
Semester: 5th
Name of Subject: Theory of Computation
Subject Code: PCIT-112
Paper ID: 16443
Scientific calculator is NotAllowed

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Qucstions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) List the applications of Context Free Grammar.
b) Explain Left -most derivation and right- most derivation tree along with suitable diagram.
c) Articulate grammar for set of all strings starting and ending with different symbol over alphabet set {a, b}.
d) Demonstrate Chomsky Normal Form with example.
e) Is NDPDA more powerful than DPDA? Justify.
f) Differentiate Kleen Star and Kleen Positive.

Part – B **[Marks: 04 each]**

Q2. List the properties of LR (k) Grammar.

Q3. Discuss in detail model of finite automata.

Q4. Explain Halting Problem of Turing Machine.

Q5. Differentiate Moore and Mealy Machines.

Q6. Design a PDA for odd number of palindromes.

P.T.O.

Q7. Compare and contrast Push Down Automata with Turing Machine.

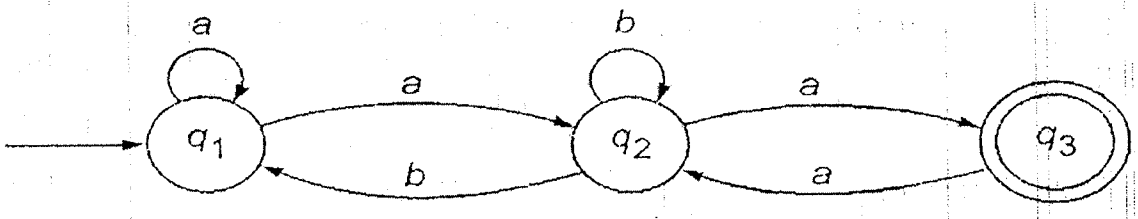
Part – C **[Marks: 12 each]**

Q8. Describe Chomsky Classification of Languages in detail.

OR

State Pumping Lemma for regular languages. Show that L= {a^p |where p is prime} is not regular.

Q9. Construct a regular expression corresponding to the automata given using Arden's Theorem:



OR

Formulate a grammar in Greibach Normal Form equivalent to grammar:

S -> AA | a

A -> SS | b

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