Roll No.: ……

SGT UNIVERSITY

END TERM THEORY EXAMINATION JULY-2022

Faculty/College of Study:	**Engineering & Technology**	**Year/Semester:**	**6th Semester**
Program:	**B.Tech. (CSE) Gen.**	**Duration:**	**03:00 Hrs.**
Course/Subject:	**Theory of Automata & Formal Language**	**Maximum Marks:**	**60**
Course/Subject Code:	**13020605**	**Batch:**	**2016 & 2017**

Instructions:-

1. Write Your Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided correct question paper. Complaint(s) in this regard, if any should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. All Questions are compulsory. Marks are indicated against each question.
4. Illustrate your answer with diagram wherever required.

SECTION-A

(Very Short Answer Type Questions)

Note: All Questions are compulsory: - **[12X1=12 Marks]**

S. No.	Question	Marks Allotted
1	What is Leftmost derivation?	1
2	What is Finite Automata?	1
3	Define Kleene closure.	1
4	What are Parse Trees?	1
5	What is Context Free Grammar?	1
6	Define Alphabet.	1
7	What is a string? Explain with example.	1
8	Define Language in Theory of Computation.	1
9	Explain Finite Language with example.	1
10	What is a Transition Table?	1
11	What is a regular expression? Give example.	1
12	Define Turing machine.	1

SECTION-B
(Short Answer Type Questions)

Note: All Questions are compulsory: - **[4X2=8 Marks]**

S. No.	Question	Marks Allotted
13	Define Algebraic laws for Regular expressions.	2
14	What is Arden Theorem?	2
15	Explain Halting Problem in Turing Machine.	2
16	What is Pumping Lemma for Context Free languages?	2

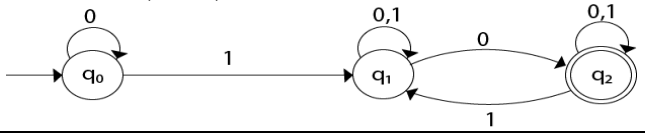
SECTION-C
(Descriptive Answer Type Questions)

Note: All Questions are compulsory: - **[4X4=16 Marks]**

S. No.	Question	Marks Allotted
17	Describe the Myhill-Nerode Theorem. **Or** Explain How a Finite Automata can be minimized?	4
18	Explain the difference between NFA & DFA with example.	4
19	Convert the following Regular Expressions to Finite Automata: i) **a*b** ii) **abc** iii) **ab*** iv**) a(b+c)**	4
20	Explain Two Stack PDA with example.	4

SECTION-D
(Long Answer Type Questions)

Note: All Questions are compulsory: - **[4X6=24 Marks]**

S. No.	Question	Marks Allotted
21	Explain Decision Properties of Context Free Languages: Emptiness, Finiteness and Membership with examples.	6
22	Describe Equivalence of Moore and Mealy Machine in Finite Automata. **Or** Explain the Hierarchy of Languages according to Chomsky in detail with examples.	6
23	Convert the following Non-Deterministic Finite Automata (NFA) to Deterministic Finite Automata (DFA)- 	6
24	Explain Deterministic Push Down Automata and equivalence with Context Free Grammar. **Or** Describe Basic Model and Language acceptance by Turing Machines.	6