



COMSATS UNIVERSITY ISLAMABAD (CU)
Park Road, Tarlai Kalan Islamabad 45550 Pakistan
Department Of Computer Science.
Final Examination. Spring - 2025.

Class: BCS - 4 A & B

Subject: CSC312 - Theory of Automata

Instructor: Osama Subhani Khan

Total Marks: 50

Time allowed: 180 Min

Date: 03-Jul-2025

NOTE: All questions should be solved (no choice). Answers should be precise.

(CLO1) Describe the fundamental concepts of automata and formal language theory.

[4+2=6 Marks]

1.1 Draw the Chomsky Hierarchy and describe all the formal languages that are categorized by Chomsky.

2 Categorize the power of different kinds of Automata studied in this course.

Design different types of automata along with inter-conversion between their equivalent representations.

[4+4=8 Marks]

Design a Mealy Machine to represent a traffic light control system. Specifications of the system are as follows:

System starts with the green light turned on as output. Once a light is turned on, it should stay that way for a certain minimum time, say 10 seconds, and then only change when a car comes up or time expires. And Red will change to Orange to Green when timer expires. And Red when timer expires. And Red will change to Orange to Green when timer expires.