



COMSATS UNIVERSITY ISLAMABAD (CUI)  
Park Road, Tarlai Kalan Islamabad 45550 Pakistan  
Department Of Computer Science.  
Mid-Term Examination. Fall - 2024.

Subject: Theory Of Automata  
Program: B.S. (C.S.)  
Semester: IV- A & B  
Date: 06 / 11 / 24

SP23 - Sec - 45

Course Code: CSC-312  
Total Marks: 25  
Time Allowed: 80 Minutes  
Instructor: Salman Aslam & Osama Subhani

- NOTE:
- 1) ALL QUESTIONS SHOULD BE SOLVED.(NO CHOICE).
  - 2) ANSWERS SHOULD BE PRECISE.

Q1) Design various kinds of automata along with interconversion among equivalent notations. [4 Marks]

1

Design a Mealy Machine to represent a traffic light control system. Specifications of the system are as follows:  
The 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. When the time expires. Green will be changed to Yellow to Red when timer expires. And Red will change to Orange to Green if timer expires or there is a car at the front.

[3.5+3.5=7 Marks]

2

a) Convert the following Non-Deterministic Finite Automata to Deterministic Finite Automata.

$$(a + b)^*abb$$

