University of Asia Pacific

Department of Computer Science & Engineering

Mid-Semester Examination Fall -2021

Program: B. Sc. Engineering (3rd Year/1st Semester)

Course Title: Theory of Computation Course No. CSE 307 Credit: 3.00

Time: 1.00 Hour. Full Mark: 60

There are **Four** Questions. **Answer questions 1, 4 and (2 or 3).** All questions are of equal value/Figures in the right margin indicate marks.

1.a)	Differentiate the transition function between Deterministic Finite Automata and Nondeterministic Finite Automata.	6
b)	Let ∑ = {the letters/symbols of your own **first** name} Suppose you want to construct the following language: "The set of all strings that accept any string of ***any length*** but will not accept your first name as a string in the beginning." Draw a corresponding NFA.	14
2.	Suppose my name is '**a**bdul **b**aten'. I use the first letter of my first name and last name in the below figures. Use first letters of your **own name (first name and last name)** in the figure(s), draw it in your script and then: i) Find out the ϵ-closure for each state. (Figure 1) ii) Find the equivalent states and minimized DFA. (Figure 2)	6 + 14

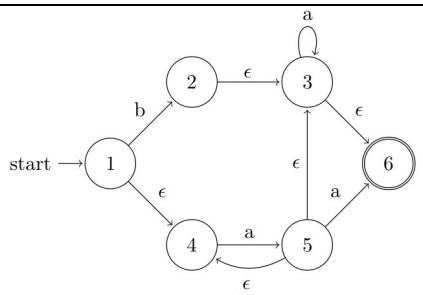


Figure 1

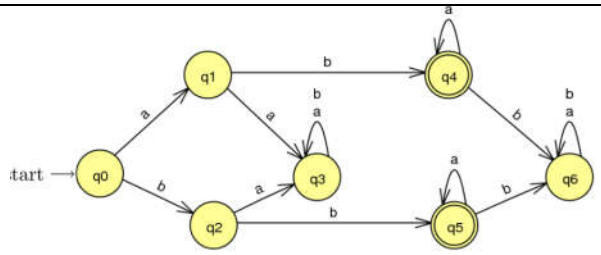
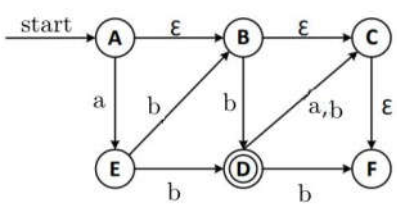
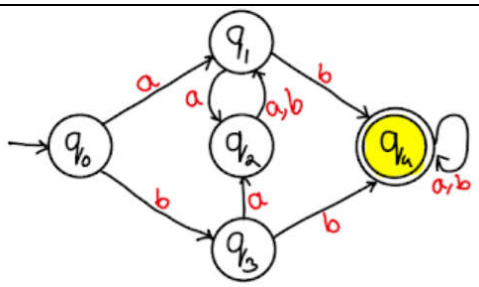


Figure 2

3.	Suppose my name is '**a**bdul **b**aten'. I use the first letter of my first name and last name in the below figures. Use first letters of your **own name (first name and last name)** in the figure(s), draw it in your script and then: i) Find out the ϵ-closure for each state. (Figure 1) ii) Find the equivalent states and minimized DFA. (Figure 2)  Figure 1  Figure 2	6 + 14
4.a)	C identifiers are strings of letters, digits, and underscores. C identifiers must start with a letter or underscore followed by any combination of letters, digits or underscores. Example of some valid variables: _, a_345, i, I, i12b, _88	10
b)	Write regular expression for 24-hour clock system. The format is [hh]:[mm]. • [hh] refers to a zero-padded hour between 00 and 24 (where 24 is only used to denote midnight at the end of a calendar day). • [mm] refers to a zero-padded minute between 00 and 59. Example of some valid times: 00:00, 00:01, … 00:59, … 11:23, … 21:44, … 23:59	10