



Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science & Engineering
Mid Examination, Summer 2025
Course Code: CSE313, Course Title: Compiler Design
Level: 3 Term: 1 Batch: 64

Time: 01:30 Hrs

Marks: 25

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1	a .)	$S \rightarrow P M Y$ $P \rightarrow G T$ $G \rightarrow \text{Gen} \mid \text{Millennial} \mid \text{Boomer}$ $T \rightarrow z \mid x \mid \text{alpha}$ $M \rightarrow \text{June} \mid \text{July} \mid \text{May} \mid \text{August}$ $Y \rightarrow D D D D$ $D \rightarrow 0 \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6 \mid 7 \mid 8 \mid 9$ For the input string: “Gen z June 2025”, determine whether the CFG is ambiguous or not.	[5]	CO 1
2	a .)	Describe the phases of a compiler for the following expression. $\text{Exp} = \text{Sal} - \beta_1 \times X + \beta_2 \times Y + \beta_3 \times Z + \epsilon * 0.3$	[6]	CO 1
	b .)	Consider the following grammar. If there is Left Recursion then eliminate it. $A \rightarrow Cx \mid Ay$ $B \rightarrow m \mid An \mid Cp$ $C \rightarrow Ae \mid x$	[4]	
3	a .)	A simplified access control system is being modeled using a Finite State Machine (FSM). In this system, a user must swipe their ID card (s), enter a correct PIN (p), and then the system grants access (a). The system also allows users to re-enter PIN if it was mistyped after swiping. Design a Finite Automaton (FA) that accepts all such strings. Clearly label all states, transitions, and final state(s) and explain the five components (5-tuples) of that Finite State Machine (FSM).	[6]	CO 1

	<i>b</i>)	If the 3(a) FSM is classified as a NFA (Non-deterministic Finite Automaton) , transform it into an equivalent DFA (Deterministic Finite Automaton) . If it is already a DFA , provide a justification for why it meets the criteria of determinism.	[4]	
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