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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 → P M Y P → G T G → Gen | Millennial | Boomer T → z | x | alpha M → June | July | May | August Y → D D D D D → 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 For the input string: "**Gen z June 2025**", **determine** whether the CFG is ambiguous or not.	[5]	CO1
2.	*a)*	**Describe** the phases of a compiler for the following expression. $\overset{1}{Exp} = \overset{2}{Sal} - \beta 1 \times \overset{3}{X} + \beta 2 \times \overset{4}{Y} + \beta 3 \times \overset{5}{Z} + \varepsilon * \overset{6}{0.3}$	[6]	CO1
	b)	Consider the following grammar. If there is Left Recursion then eliminate it. A → Cx | Ay B → m | An | Cp C → Ae | 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]	CO1
	b)	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]	