

Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering Final Semester Examination, Spring 2025 Course Code: CSE223, Course Title: Digital Logic Design Level: 2 Term: 2 Batch: 65

Time: 2:00 Hrs

Marks: 40

Answer ALL Questions [Optional]

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

	Circuit for priority encoder.		005
b)	Implement the Boolean function F $(x_1, x_2, x_3, x_4) = \Sigma (0, 2, 5, 7, 8, 10, 13, 15)$ with a Multiplexer. Assume x_1, x_3 and x_4 are connected with selection lines.	5	
<i>a)</i>	For the following input draw the output waveforms Q & Q' for a D flip-flop. Consider, Initially the flip-flop is in reset state.	5	CO4
<i>b)</i>	Design a 4-bit serial in the parallel-out shift register.	5	
a)	Define synchronous and asynchronous counters. Design a three-bit up/down counter using T flip-flops. It should include a control input called UP /Down. If UP /Down = 0, then the circuit should behave as an up counter. If UP /Down = 1 then the circuit should behave as a down-counter.	5	CO4
b)	Create a comparison table that highlights the key differences and applications between RAM and ROM, considering their characteristics, advantages, and limitations.	5	
<i>C</i>)	A smart home system is designed to automatically control the room Light and Fan. The system should activate the lights and fan based on the following conditions: Condition 1: Light(A, B, C) = $\sum m(0, 1, 2, 4)$ Condition 2: Fan(A, B, C) = $\sum m(0, 5, 6, 7)$ Construct the PLA implementation for the Lights and Fan functions	10	
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