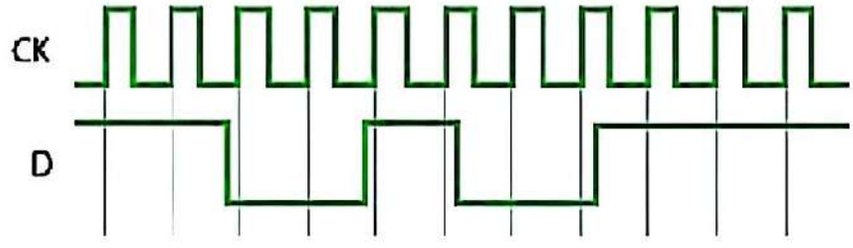
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Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final Examination, Fall 2023
Course Code: 223, Course Title: Digital Electronics
Level: 2 Term: 2 Batch: 62

Time: 02:00 Hrs **Marks: 40**

Answer ALL Questions

1.	*a)*	Suppose, You have been tasked with developing a digital system for an automated parking facility that manages the entry of cars based on four types of signals from sensors at the gate. These sensors are responsible for detecting VIP vehicle clearance, general vehicle presence, special permit holders, and service vehicles. The signals must be processed to ensure VIP vehicles are given immediate access over all others, followed by special permit holders, service vehicles, and general vehicles. The parking gate system can only process a single type of vehicle at a time. Now, you must Develop a Truth table, Boolean expression, and Circuit diagram for this system.	[10]	CO2
2.	*a)*	Construct 4 to 16 line decoder with five 2 to 4 line decoders.	[5]	CO3
	b)	Construct octal to binary encoder circuit.	[5]	
	c)	Implement the following Boolean function with a 4 x1 multiplexer $F(A, B, C, D) = \sum(1, 3, 4, 11, 12, 13, 14, 15)$	[5]	
3.	*a)*	Explain how does a flip-flop function in a sequential circuit?	[5]	CO4
	b)	Identify the output states Q and Q' for D flip flop, given the following pulse inputs. 	[10]	