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Daffodil International University

Department of Software Engineering
Faculty of Science & Information Technology
Midterm Examination, Spring 2026
Course Code: SE 111; Course Title: Computer Fundamentals
Sections & Teachers: SI (A,B), MKH (C,D,E), FC (F), AG (G), AAS (H)

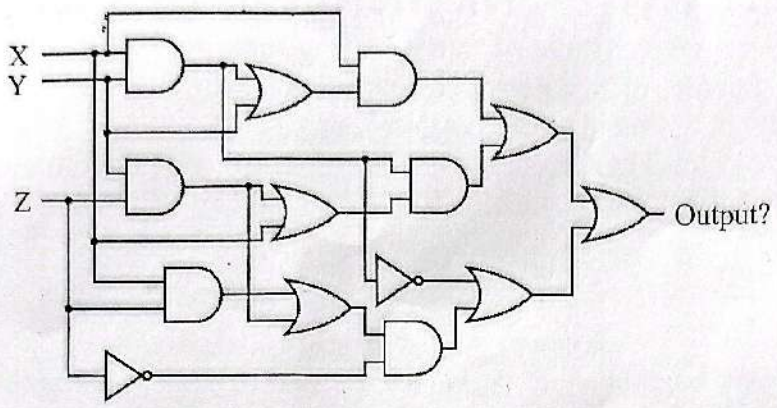
Time: 1 Hour 30 Mins **Marks: 25**

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)*	When a computer is powered on, it follows a set of built-in instructions that guide it to check hardware components and load the operating system. These instructions are permanently stored inside the system and remain available even when the power is turned off. After startup, the computer uses a fast working space to store currently running programs and open files, allowing them to be accessed quickly. To make processing even faster, the system also relies on a very small and ultra-fast memory, which is located close to the processor. This component temporarily holds the most frequently used data and instructions. This helps the processor avoid repeatedly fetching data from the main working space and improves overall speed. When the computer is turned off or power is interrupted, all temporary working and high-speed data are cleared, while the built-in startup instructions remain unchanged. Based on the scenario, **explain** the components briefly along with their functions in processing.	[Marks-6]	CLO-1 *C2*
	b)	i) **Convert** 11011_2 to its Base 16 equivalent Number. ii) **Convert** 0111101.101110_2 to its Base 10 equivalent Number. iii) **Convert** 456_{11} to its Base 4 equivalent Number.	[Marks-9]	
2.	*a)*	An engineer designs a digital circuit using only one type of logic gate to simplify hardware. By connecting its inputs, he saw that the gate acts as an inverter. By combining two gates, it produces an output only when both inputs are active. With another arrangement, he connects three gates and observes that the same gate generates an output when at least one of its inputs is active. **Identify** the logic gate the engineer used in the above scenario and **illustrate** the work using a diagram for each implementation.	[Marks-3]	CLO-2 *C4*

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b)	**Identify** the final output for each logic gates from the given logic circuit diagram also simplify the output result and prove your simplification using truth table. 	[Marks-7]	