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# Daffodil International University

**Faculty of Science & Information Technology**

**Department of Software Engineering**

**Midterm Examination, Summer 2026**

**Course Code: SE 111; Course Title: Computer Fundamentals**

**Sections & Teachers: DMH (A,B,C), WNI (D,E), SI (F,G), MIS (H,I,J), SD (k,L,M), RRB (N)**

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

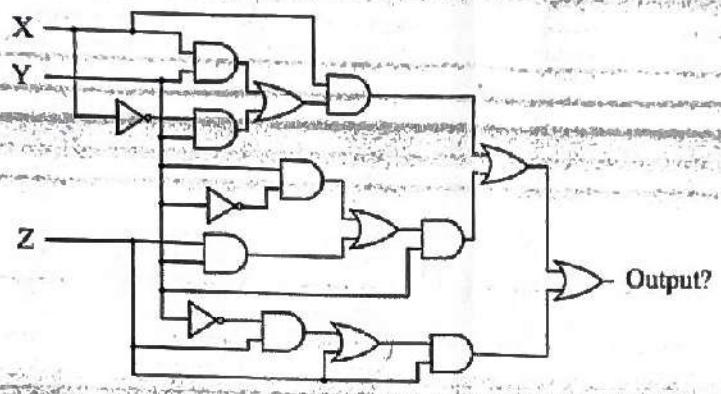
## Answer ALL Questions

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

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|---|---|---|---|---|
| 1. | a) | JEBON INC. is an analytics company who is processing millions of sales transactions every day to generate business insights. All raw transaction records from different branches are first kept in a large storage system that preserves data even when the computer is turned off. When analysts run a report, the required dataset and analysis software are loaded into a faster working area so that the processor can access them quickly during active processing. While generating reports, the system notices that some instructions like sorting and filtering operations are used repeatedly. So, the system keeps them in a very small storage area close to the processor to reduce repeated access time. During each calculation step like adding totals or comparing values, the processor temporarily holds a few numbers directly inside itself to perform operations instantly before moving to the next task. This temporary memory helps to transfer data, instructions from one component to another.<br><br>Based on the scenario, **explain** the components briefly along with their functions in processing. | [Marks-6] | CLO-1<br>C2 |
| | b) | i) **Convert** $F16A_{16}$ to its Base 6 equivalent Number. ✓<br>ii) **Convert** $10111.110111001_2$ to its Base 10 equivalent Number.<br>iii) **Convert** $951_{11}$ to its Base 9 equivalent Number. | [Marks-9] | |
| 2. | a) | DIU Data Science Lab uses an automated safety alert system to monitor its main entrance. The system is connected to two sensors. One checks whether the door is open and the other detects any movement near the entrance. The alarm system is designed with a strict rule. If either the door is open or any motion is detected, the system immediately considers the area unsafe and does not allow the "safe status" indicator to turn on. Only when the door remains fully closed and there is no movement at all does the system confirm that everything is secure and activates the safe indicator. In all other situations, the system stays in an alert state, treating any detected activity as a potential risk.<br><br>**Identify** the logic gate used in the above scenario and **illustrate** the work using a diagram for each implementation. | [Marks-3] | CLO-2<br>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] | |




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