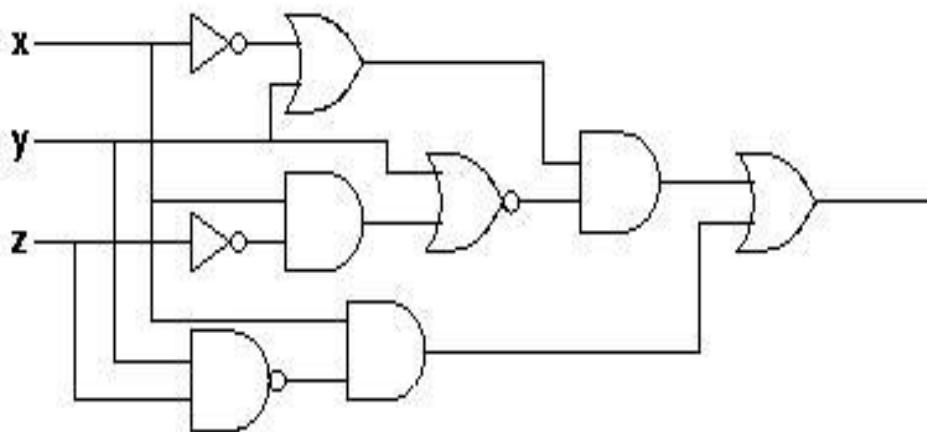


**UNIVERSITY OF ENERGY AND NATURAL RESOURCES**  
**DIGITAL ELECTRONICS [CENG 211]**  
**MIDSEMESTER EXAMINATION**

**TO BE SUBMITTED ON MONDAY 30<sup>TH</sup> NOVEMBER 2015**  
**EXAMINER: KANKAM OKATAKYIE ADU**

**Question 1**

The circuit below is used to read Diagnostic Trouble Code of vehicles. The design is expensive and cumbersome. As a computer scientist, use any known method to simplify the circuit to make it smaller and cheaper  
[10 marks]



**Question 2**

The four pushbutton switches (a, b, c, and d) in the circuit below are accessible to the person wishing to enter the door. The four toggle switches (A, B, C, and D) are located behind the door, and are used to set the code necessary for entering.

- Explain how this system is supposed to work.
- What are the logic states of the respective gate outputs when a matching code is entered through the pushbutton switches?
- How about when a non-matching code is entered?

