1. Software simulation:

1.1. Design on proteus using only electronic components (no microcontrollers) a system that receives three signals, two digital signals and one analog signal. If the two digital signals are the same and the analog signal is below 0.5 V, then an LED remains off (this state is considered a normal state). The LED turns on immediately if either signals are different or the analog signal is above 0.5 V (this state is considered a fault state). The LED remains on for 10 seconds when a fault state occurs then turns off after those 10 seconds. The LED turns on again if fault state occurred after a normal state. Use SPST switches connected to +3.3 V from one terminal and to the system from the other terminal to represent the digital signals. Use battery or voltage source to represent the analog signal. Refer to data sheets for the components used.

1.2. Implement PCB layout for the previous circuit using any CAD (preferable if Altium).

1.3. Design on proteus using only electronic components (no microcontrollers) a circuit that latches when a signal triggers For example, you have normal condition (steady state) as low but a high signal triggers (or open cct triggers) or your normal condition is high but low signal triggers.

1.4. Plus: Implement PCB layout for the previous circuit using any CAD (preferable if Altium)

1. Research part:

- Answer the following questions

1. What are the properties and types of relays and switches? What is the main difference between them? (Demonstrate using pictures.)

2. What are the types of transistors? When and how to use it?

3. What do you know about (Voltage / Current) sensors ?

After finishing both parts, upload to google drive compressed file including:

1. Your proteus projects.

2. Data sheets for the used components.

3. Your PCB designs if implemented (if you used a CAD other than Altium, upload images of your PCB showing all details beside your layout design).

The link of the google drive folder should be put in your report. Remember to make the link accessible!