

Students should answer all questions in the scriptbook provided. All questions are of equal weight.

Question 1. (Project Parameters)

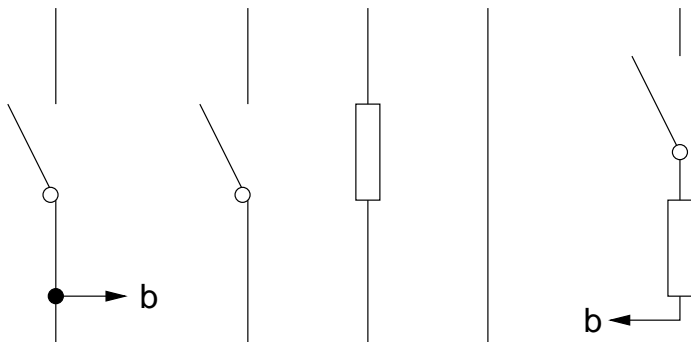
A project is defined by 3 project parameters. Briefly describe the parameters and the project documentation in which they are defined.

Question 2. (Change Management)

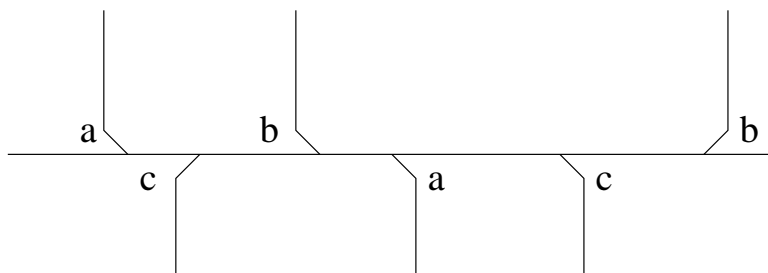
Changes invariably occur during the life of a project e.g. change in performance requirements, budget etc. Briefly outline how such changes are effectively managed in the project, and how they can be minimised.

Question 3. (Electronic Wiring)

1. Draw a **single line** representation of a **seventy-two (72)** bit data bus.
2. In the diagram below, what is the purpose of the **omitted line** referenced by arrows?



3. Detail the **signal flows** in this diagram of **group wiring**.



4. Give an example of a multi-component device in your Fire Alarm schematic for which you used a **detached** representation.
5. In the Australian Standard convention for part designation, what **letter** designates an electromechanical **relay**?

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Question 4. (Logic Symbols)

1. Give an example that demonstrates the difference between a **component** and a **device**.
2. Draw the IEEE standard symbol for:
 - (a) A **non-inverting buffer**.
 - (b) A 2-input **AND** gate.
 - (c) A **3-input open-collector NAND** gate.
 - (d) A *single* device that functions as *three* 2-input AND gates in *parallel* followed by *one* 3-input open-collector NAND gate.

Question 5. (Interconnection of Circuits)

1. Briefly describe the **purpose** of each of these aspects of a “Thru-hole” printed circuit board:
 - (a) **substrate**
 - (b) **thru-holes**
 - (c) **tracks**
 - (d) **pads**
2. In a double-sided PCB, what is the function of **vias** (also known as **plated thru-holes**)?

Question 6. (Computer Aided Design of Circuits)

1. The following questions concern a Hex **Open Collector NOT** gate IC in Protel Schematic:
 - (a) Some capacitors are in the Miscellaneous library. Name a (different) Protel **Library** that contains the Hex OC NOT gate IC.
 - (b) What is the IC’s **Library Reference**? (This is the IC’s name inside the Library. For example, the Quad AND gate IC’s reference is SN74LS08 in one library.)
 - (c) What’s a convenient **Designator** for the IC? (This is the name you choose to distinguish this specific IC - and its constituent gates - from all the others on the circuit diagram. For example, the second AND gate IC could be AND2.)
 - (d) What is the IC’s **Part Type**? (This is what you should ask for when you order from a supplier. For the Quad AND gate IC it is 74LS08.)
2. In the Netlist, which specifies components and connections for the PCB Layout program, each device also has a footprint which specifies its shape, size, and pin positions. The LM555 timer has the footprint DIP-8. What is the **Footprint** of the **Hex Open Collector NOT gate IC**?