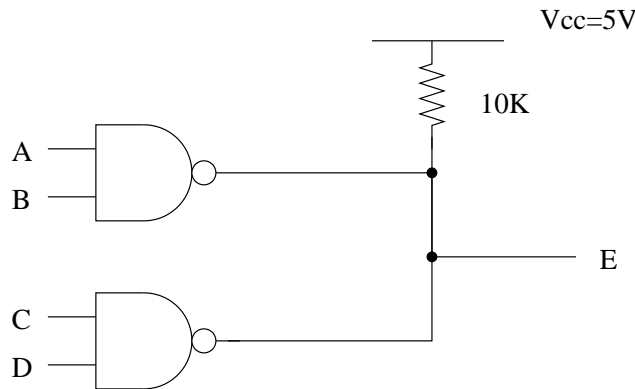


Question 1. (Project Management)

There are four phases of project management: defining the project, planning the project, implementing the project and completing and evaluating the project. Briefly describe the major activities involved in each of the four phases.

Question 2. (Project Hardware)

The circuit shown below uses open-collector logic gates. The inputs to the circuit are marked by A, B, C, and D, and the output of the circuit is marked by E. Determine the logic function of the circuit and draw another circuit that is equivalent to this circuit.



Question 3. (Electronic Wiring)

1. Sketch a circuit that is commonly drawn **diagonally**.
2. Name the circuit you just sketched.
3. When would a **multi-element** circuit component be drawn in a **detached** representation?

Question 4. (Logic Symbols)

Draw the IEEE standard symbol for:

1. An **inverter**.
2. A **3-input OR** gate.
3. A **single** device consisting of *two* **2-input AND** gates followed by *one* **2-input XOR** gate.

Question 5. (Interconnection of Circuits)

1. What does it mean to **color-code** the wiring in your circuits?
2. Give two (2) ways in which a **breadboard** (proto-board) is **less reliable** than a **printed circuit board** (PCB).
3. Carefully draw a **thru-hole** connection, labelling all the constituent parts.

Question 6. (Computer Aided Design of Circuits)

1. What are the advantages of CAD packages (such as Protel) for schematic design over drawing a circuit diagram on paper?
2. Does CAD have any disadvantages, and if so, what are they?
3. Why is the placement of components important? What should the designer aim to achieve when placing components?
4. The 74LS05 IC contains six gates of what kind?
5. What is the spacing between the pins of a 74LS05?
6. When describing a track, what does the word “mitred” mean?
7. In what situation are bus tracks mitred?