

Design & Technology

Edexcel GCSE

Control Devices

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

Good luck!

Q1. What is the main job of a resistor in a circuit?

- A** To store electrical charge
- B** To limit the current flowing
- C** To produce light

Q2. Which control device is an electromagnetic switch that lets a low-power circuit switch a high-power circuit?

- A** Relay
- B** Resistor
- C** LDR

Q3. Using Ohm's law, what is the resistance when the voltage is 6 V and the current is 0.02 A?

- A** 0.12 Ω
- B** 30 Ω
- C** 300 Ω

Q4. What is the output of an AND gate when only one of its two inputs is on?

- A** Off
- B** On
- C** It flashes

Q5. Which component lets a small current from a sensor switch on a much larger current, with no moving parts?

- A** Relay
- B** Transistor
- C** Push switch

Q6. Which unit is resistance measured in?

- A** Amps
- B** Volts
- C** Ohms

Q7. A student designs a prototype circuit. A 5 V supply powers an LED (D1) through a resistor (R1). The LED needs 2 V to switch on. The current flowing through R1 is 10 mA.

Calculate the correct resistor value to enable the LED to switch on. Use $V = I \times R$. Show all workings. **(2 marks)**

Q8. An eight-pin IC (integrated circuit) and several resistors are fitted on a circuit board. The IC has a small notch at one end.

Q8a. State the purpose of the notch on the IC. **(1 mark)**

Q8b. Identify one reason for the colour bands on the resistors. **(1 mark)**

Answers

Q1. B

Q2. A

Q3. C

Q4. A

Q5. B

Q6. C

Q7.

- Voltage across R1 = $5 - 2 = 3 \text{ V}$ (1)
- $R = V \div I = 3 \text{ V} \div 10 \text{ mA (0.01 A)} = 300 \Omega$ (1)

Credit any other appropriate method.

Q8a.

One from (1 mark): to fit the IC chip the right way round in its holder; to indicate which pin is pin 1.

Q8b.

One from (1 mark): gives the value of the resistor; indicates the tolerance of the resistor.