

Design & Technology

Edexcel GCSE

Outputs

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. Which component converts electrical energy into rotary motion?

- A** Motor
- B** Buzzer
- C** LED

Q2. Which of the following is a sound output device?

- A** Thermistor
- B** Speaker
- C** Solenoid

Q3. Why must an LED usually have a resistor connected in series with it?

- A** To make it brighter
- B** To change its colour
- C** To stop too much current flowing through it

Q4. Which output pulls or pushes a metal rod in a straight line, for example in an electric door lock?

- A** Solenoid
- B** Servo motor
- C** Lamp

Q5. Which is a disadvantage of a filament lamp compared with an LED?

- A** It cannot produce light
- B** It uses more power and gets hot
- C** It only comes in one size

Q6. How can the direction of a DC motor be reversed?

- A** By adding a resistor
- B** By using a bigger battery
- C** By reversing the direction of the current

Q7. A voice-controlled smart speaker can play music, set alarms and provide news. It uses a number of inputs and outputs to function.

Complete the table below with the missing inputs or outputs and electronic components. **(6 marks)**

Function	Input or output / Electronic component
Turn the device on	 /
Provides sound to play music	 /
Illuminates to show when the device is switched on	 / LED
Listens to the human voice	 / Microphone

Q8. Most irons use a light emitting diode (LED) as an output device.

Explain two benefits of using LEDs in a product. **(2 marks)**

1

2

Q9. A desk fan uses an electric motor.

Describe the function of the electric motor in the fan. **(2 marks)**

Q10. An electric toothbrush has an LED which shows when the battery is being charged by outputting light.

Identify one other electronic component that creates an output. **(1 mark)**

Answers

Q1. A

Q2. B

Q3. C

Q4. A

Q5. B

Q6. C

Q7.

One mark for each correct answer (6 marks). These are the only acceptable answers:

- Turn the device on: Input (1); Switch (1) (accept push button switch)
- Provides sound to play music: Output (1); Speaker (1)
- Illuminates to show when the device is switched on: Output (1)
- Listens to the human voice: Input (1)

Q8.

1 mark for each benefit explained in full; maximum 1 mark without explanation. Benefits of LEDs:

- Long life (they don't burn out)
- Energy efficient (therefore cheaper)
- Ecologically friendly (free from toxic chemicals); can be recycled
- Design flexibility (can be combined into any shape)
- Operate in both cold and hot temperatures
- Available in many different colours and sizes
- Safety feature

Q9.

1 mark for a statement, 2 marks for a description, e.g.:

- Motors provide rotary motion (1) when they receive electricity/power (1)
- It rotates/spins the blades of the fan (1), creating wind/air movement (1)
- It converts electrical energy (1) into mechanical energy (1)

Q10.

One from (1 mark): buzzer/bell/piezo; speaker; motor/servo. Accept bulb/lamp. Do not accept LED or battery.