Design & Technology
(Product Design)

OCR A-Level

Modern Technologies Supporting Product Function (6.3b)

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 is the output in a temperature warning system?

    A   Lamp

    B   Switch

    C   Temperature sensor

Q2. What is the electrical component shown used for?

    A   To detect pressure levels

    B   To switch equipment on or off

    C   To switch the direction of a motor

Q3. Which component is the input in a temperature warning system?

    A   Lamp

    B   Switch

    C   Temperature sensor

Q4. Which of the following is not an input for a system?

    A   Light sensors

    B   Pressure sensors

    C   Timers

Q5. The image below shows a robotic vacuum cleaner and its charging dock. The robotic vacuum cleaner can be programmed to clean each room of a house. The robotic vacuum cleaner will self-navigate obstacles and brush/remove dirt from the floor.

Identify three advantages of using the robotic vacuum cleaner over a traditional upright vacuum cleaner. Justify each of your answers. **(6 marks)**

_____

_____

_____

_____

_____

Q6. Complete the system for an intruder alarm system **(3 marks)**

Input block: _____

Process block: _____

Output block: _____

Answers

Q1. A
Q2. B
Q3. C
Q4. C

Q5.
Possible advantages may include:
- It can be programmed to work independently so it can be used by people with mobility problems (1) giving them more independence as they do not have to have help with cleaning/ have to struggle with a heavier vacuum cleaner (1).
- Can work while the homeowner is out (1) saving them time as they no longer have to spend their time vacuuming (1).
- Can access hard to reach spots (1) as it is small/ cordless so can slide under sofas or beds, ensuring a more thorough clean (1).
- It is a smaller size than an upright cleaner so it is good for people with less storage space (1) as it can be kept in a drawer or discretely at the changing point (1).
- Any other valid suggestion.

Q6.
Inputs:
- Light sensors
- Temperature sensors
- Pressure sensors
- Switches
- Pressure pad

Processes:
- Microcontrollers
- Timers
- Decision making

Outputs:
- Buzzers
- Speakers
- Lamps