6. Automated and emerging technologies

6.1 Automated systems

1   A farm has an automated drinking system for its animals. The drinking system has a water bowl that contains the water. When the water bowl is empty, it is automatically refilled.

The system uses a sensor and a microprocessor.

(a) Identify the most appropriate sensor for this system.

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(b) Describe how the sensor and the microprocessor are used to automatically refill the water bowl.

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2 A manufacturing company uses an automated system in its manufacturing process.

(a) The automated system uses a flow sensor.

Identify what a flow sensor measures.

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(b) Explain **one** advantage to employees of using an automated system in manufacturing.

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(c) Explain **one** disadvantage to the company owner of using an automated system in manufacturing.

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.... [2]

3   **(c)** The robot plants seeds and stops when it reaches a fence. It then turns and continues planting seeds. The robot uses sensors and a microprocessor to know when it reaches a fence.

Explain how the robot uses sensors and a microprocessor to know it has reached a fence.

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4   A robot vacuum cleaner uses sensors to navigate around obstacles in a room.

(a) Tick (✓) **one** box to show which sensor would be the most suitable for this purpose.

A   proximity   ☐

B   flow   ☐

C   pressure   ☐

D   level   ☐

[1]

5   A farmer has a plough that is an automated system. The plough is used to dig the ground in a field to prepare it for planting seeds.

The plough uses sensors and a microprocessor to maintain a straight line when digging the ground.

(a) State what is meant by an automated system.

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(b) Describe the role of the microprocessor in this process.

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(c) Give **two** benefits to the farmer of using an automated system for this purpose.

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[2]