



### 3.6.1 Overview of Monitoring and Control Systems

#### Computer Science (9608)

May/June 2015.P31/P32

5 A gardener grows vegetables in a greenhouse. For the vegetables to grow well, the temperature needs to always be within a particular range.

The gardener is not sure about the actual temperatures in the greenhouse during the growing season. The gardener installs some equipment. This records the temperature every hour during the growing season.

- (a) Name the type of system described. [1]
- (b) Identify three items of hardware that would be needed to acquire and record the temperature data. Justify your choice for each. [6]

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6 A company grows vegetables in a number of large greenhouses. For the vegetables to grow well, the temperature, light level and soil moisture need to always be within certain ranges.

The company installs a computerised system to keep these three growing conditions within the best ranges. Sensors are used for collecting data about the temperature, light level, and moisture content of the soil.

- (a) Name the type of system described. [1]
- (b) Give three items of hardware that would be needed for this system. Justify your choice. Do not include sensors in your answer. [6]
- (c) (i) Describe what is meant by feedback in the above system. [3]
- (ii) When the system was designed, various parameters for temperature were set. Name one of these parameters. [1]
- (iii) Explain how this parameter value is used by the feedback system. [2]

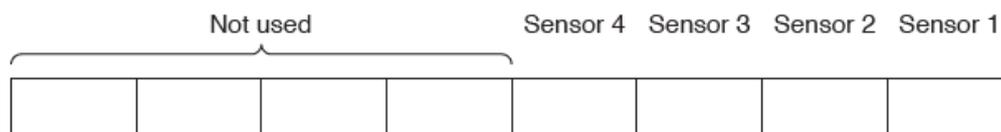
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6 An intruder detection system for a large house has four sensors. An 8-bit memory location stores the output from each sensor in its own bit position.

The bit value for each sensor shows:

- 1 – the sensor has been triggered
- 0 – the sensor has not been triggered

The bit positions are used as follows:



The output from the intruder detection system is a loud alarm.

- (a) (i) State the name of the type of system to which intruder detection systems belong. [1]
- (ii) Justify your answer to part (i). [1]
- (b) Name **two** sensors that could be used in this intruder detection system. Give a reason for your choice. [4]





### 3.6.1 Overview of Monitoring and Control Systems

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7 A museum stores antique items that need to be kept at constant temperature.

The museum is not sure about the actual temperatures. The museum installs some equipment. This records the temperatures every hour and ensures the temperature stays within a set range.

(a) Identify the type of system described.

[1]

(b) The system has a temperature sensor.

Identify **two** other items of hardware that the museum can use for the type of system identified.

Describe the purpose of each item.

[4]

