Monitoring and control – 2022 IT AS 9626
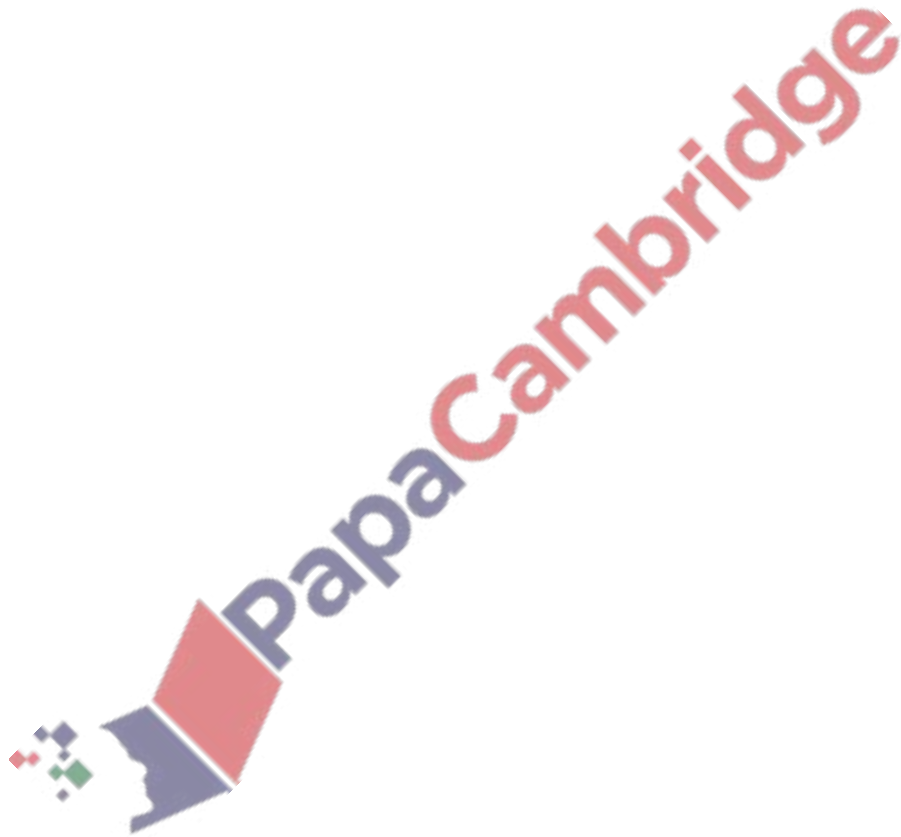
1.

   Jose has a greenhouse to grow his plants. He lives in a country which has a warm climate so the greenhouse does not need a heater but has microprocessor controlled windows and a temperature sensor.

   (a) Describe how the sensor represents the temperature so the computer can read the data.

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(c) Discuss the advantages and disadvantages, to Jose, of using microprocessor control in this scenario.

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2.

Schools often use computerised weather stations to collect data, rather than requiring their students to do it manually.

Discuss the advantages and disadvantages of schools using monitoring technologies rather than students taking readings manually.

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3.

Describe the inputs, processing and outputs in a microprocessor controlled burglar alarm system.

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4.

A farmer is concerned that the chemicals he is using to improve his crops are seeping into the local river. He has asked a local conservation group to investigate if this is the case. They will be using a computer and one set of sensors to monitor the level of pollution.

List examples of sensors the group will use and describe how they will be used with the computer to monitor the pollution level.

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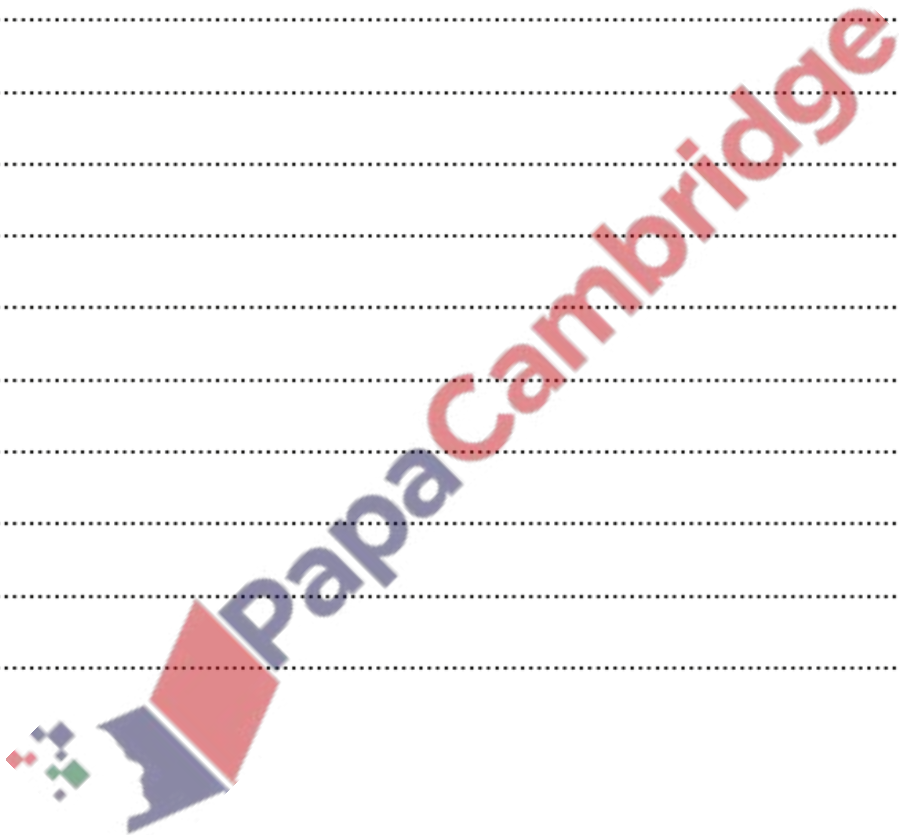
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5.

Sensors are used in monitoring systems to measure physical variables. It is important that sensors are calibrated before use.

(a) Describe, in detail, these sensors and give an appropriate use for each. Each use must be different.

Humidity ....

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Sound ....

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(b) Explain the importance of calibration.

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(c) Describe the differences between one point calibration and two point calibration.

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6.

A microprocessor-controlled car park barrier is used to allow cars to enter a car park. When a car approaches the barrier, the barrier automatically rises to allow the car to enter. It does not lower until the car is safely clear of the barrier system. There is a light sensor and light beam source immediately before the barrier. No tickets are issued by the system. The system operates continuously while it is switched on.

Complete this pseudocode algorithm to describe the processing involved. Your pseudocode algorithm should include IF…THEN statements.

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    REPEAT
        INPUT reading from induction loop
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