ICT applications – 2021/20 IGCSE 0417

1. Nov/2021/Paper_11/No.9

   Robots are used to spray paint cars in a car production company.
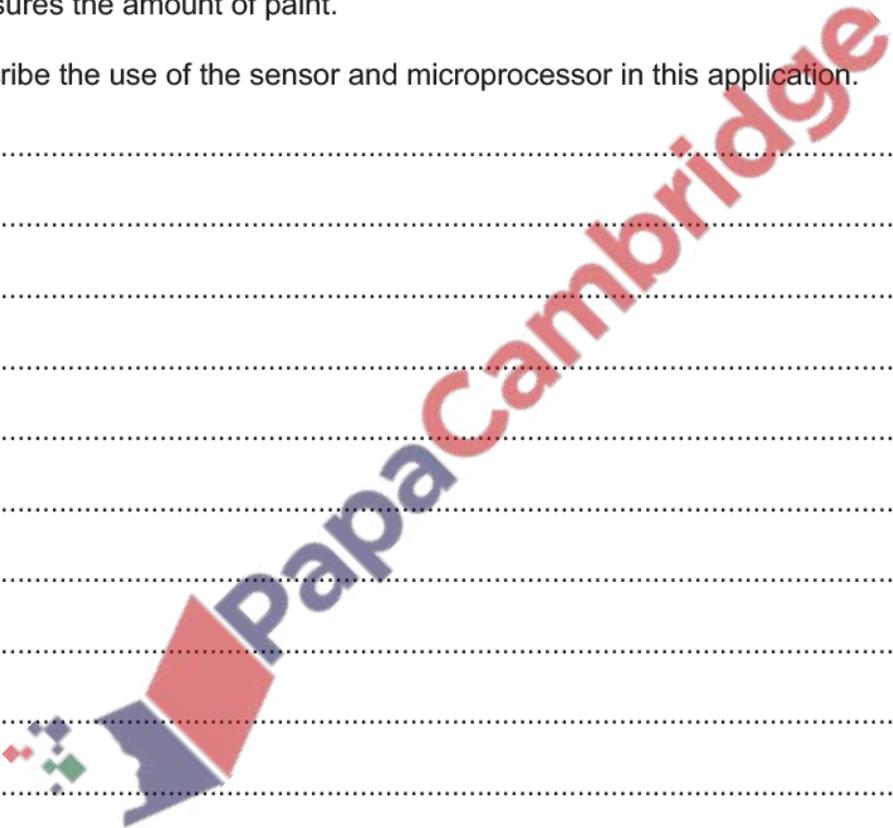
   (a) Describe **two** other jobs that robots can perform in car production.

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   (b) When the spray paint can is empty it needs to be refilled. There is a sensor in the can which measures the amount of paint.

   Describe the use of the sensor and microprocessor in this application.

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(c) Discuss the advantages and disadvantages of the introduction of robots rather than employing humans to spray paint the cars.

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2. Nov/2021/Paper_13/No.3

(a) Identify **two** applications that use expert systems.

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(b) Identify **three** components found in an expert system.

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3.

Fewer and fewer customers now use high street banks, preferring to bank online using the internet.

(b) Discuss the advantages and disadvantages of internet banking for the customer.

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4.

Rockit Motors has opened a car store in a shopping mall.

Customers can test drive the cars they are planning to purchase using virtual reality systems within the store.

(a) Name **two** devices which would be used in this virtual reality system.

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(b) Explain the term virtual reality.

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5.

(b) Describe the computer processing involved in the use of a microprocessor-controlled fitness tracker when displaying and monitoring the blood pressure of the user.

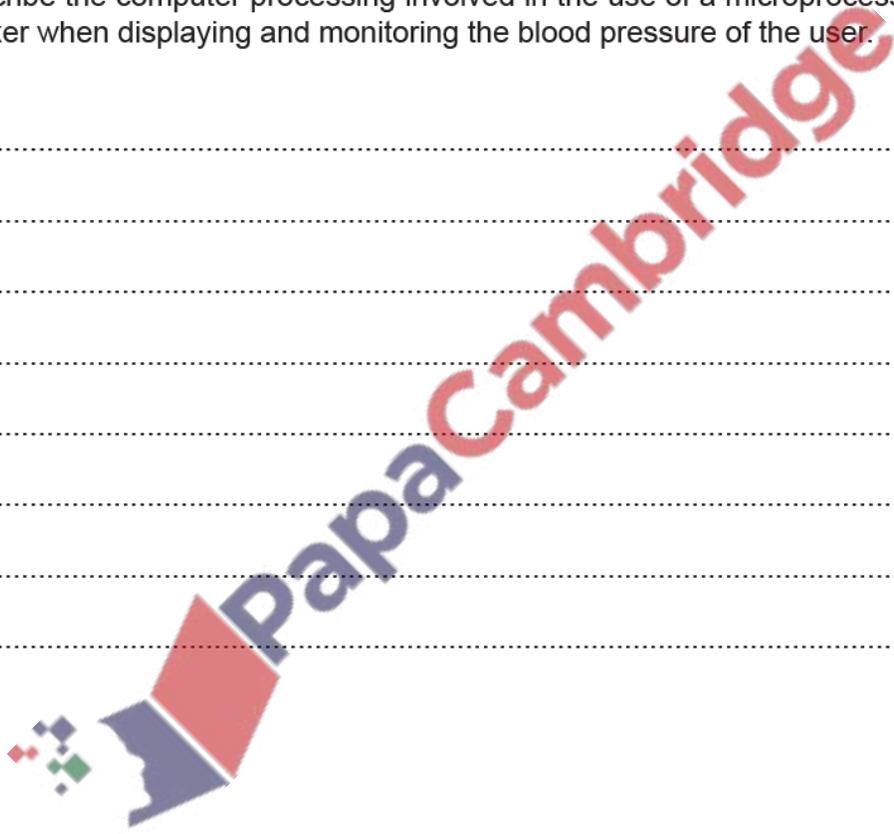...

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6. June/2021/Paper_11/No.4

Many banks have reduced the number of staff in their branches and replaced them with automatic teller machines (ATMs). These ATMs, which can be located within the bank, can be used by customers to deposit and withdraw money from their bank accounts.

(a) ATMs can be used to deposit cheques.

Describe the computer processing involved in depositing a cheque at an ATM.

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(b) Customers can visit these banks or use internet banking.

Discuss the advantages and disadvantages to a customer of visiting the bank rather than using internet banking.

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7. June/2021/Paper_11/No.13

RockIT Airlines representatives use a computer booking system to book flights for customers.

A representative from the airline types in the customer reference number, the number of passengers, departure time, departure date, departure airport and the destination airport.

A customer is planning to take a flight from London Heathrow Airport. The representative types in a code LHR for London Heathrow Airport. One of the reasons for using a code for the airport is to improve data accuracy.

(a) Describe **two** other advantages of using a code rather than typing out the full name.

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[2]

(b) Describe the importance of data accuracy when making a booking.

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(c) Describe the processing and outputs involved in making the booking.

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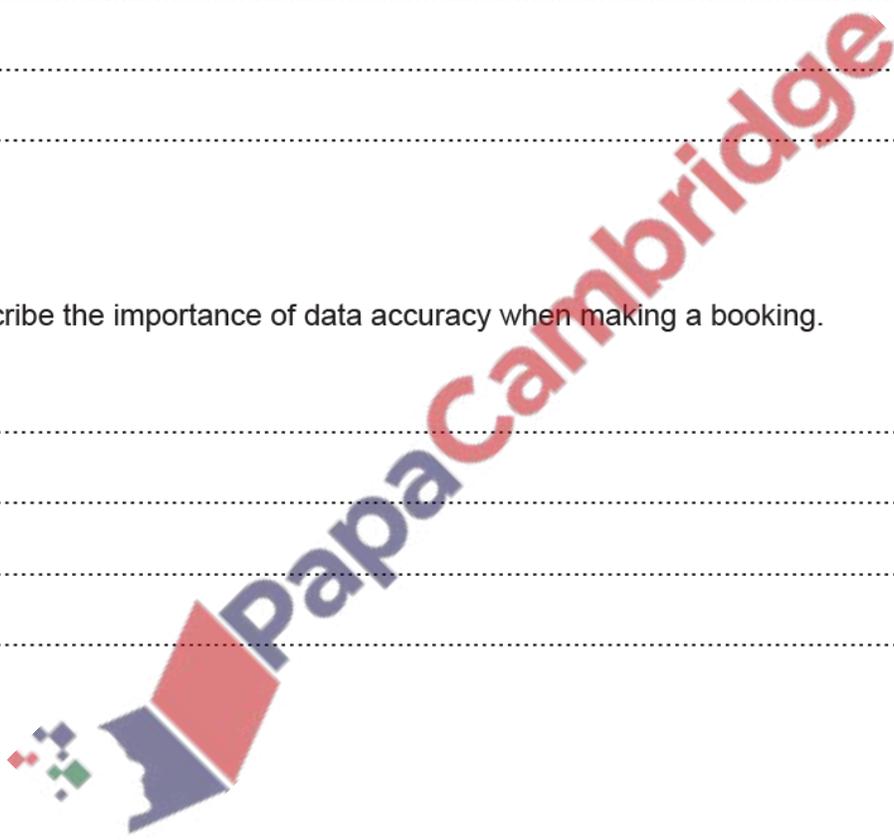
A road through a village has a speed limit of 45 kilometres per hour. The police are checking and recording the speed of vehicles passing through the village using measuring hardware and software, so they can produce a report of their findings.

(a) Explain the difference between measurement and control when using microprocessors.
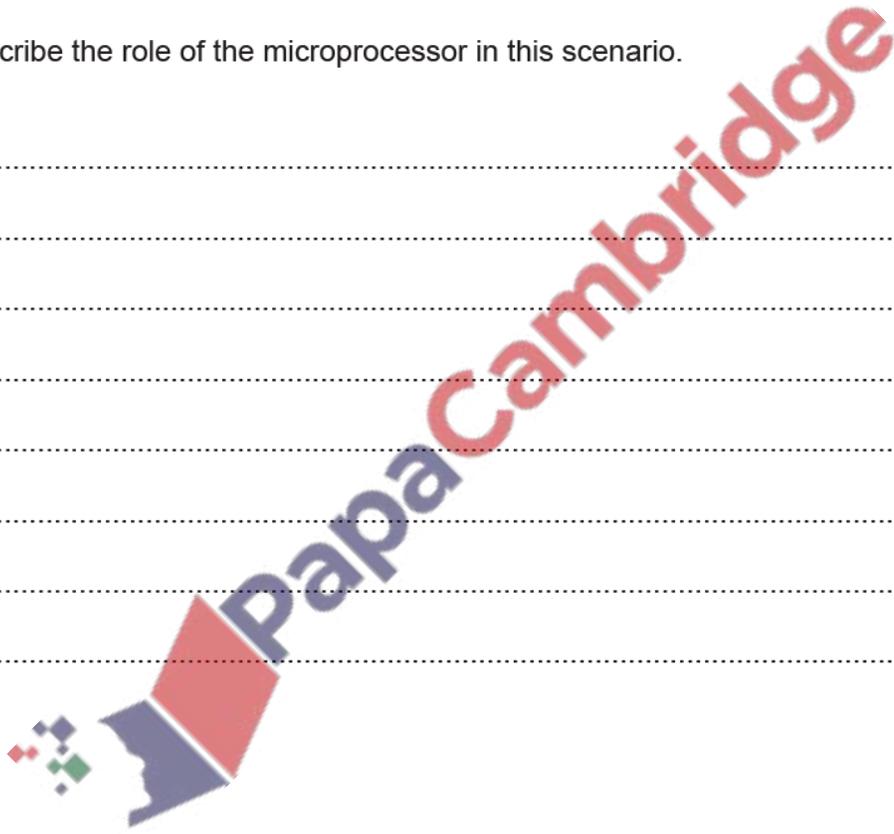
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(b) Describe the role of the microprocessor in this scenario.

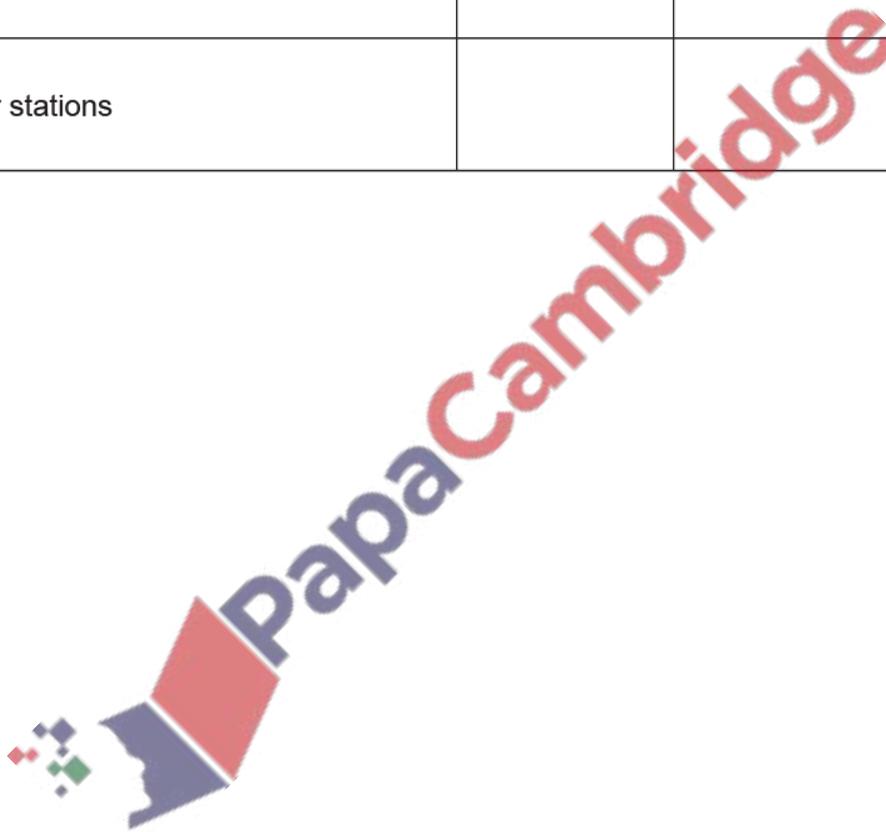...

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9.

Tick (✓) whether the following are examples of **control**, **measurement** or **modelling** applications.

	control (✓)	measurement (✓)	modelling (✓)
Personal finance			
Weather forecasting			
Burglar alarms			
Weather stations			

[4]

10. June/2021/Paper_12/No.6

Humans can send unmanned aircraft into storms to collect wind speeds and temperature data. The unmanned aircraft have sensors attached to them which send the data back to computers at the weather station. The computers analyse the data.

Previously the aircraft was manned and all the data was collected and flown back to the weather station.

Discuss the advantages and disadvantages of using the unmanned aircraft rather than using the manned aircraft.

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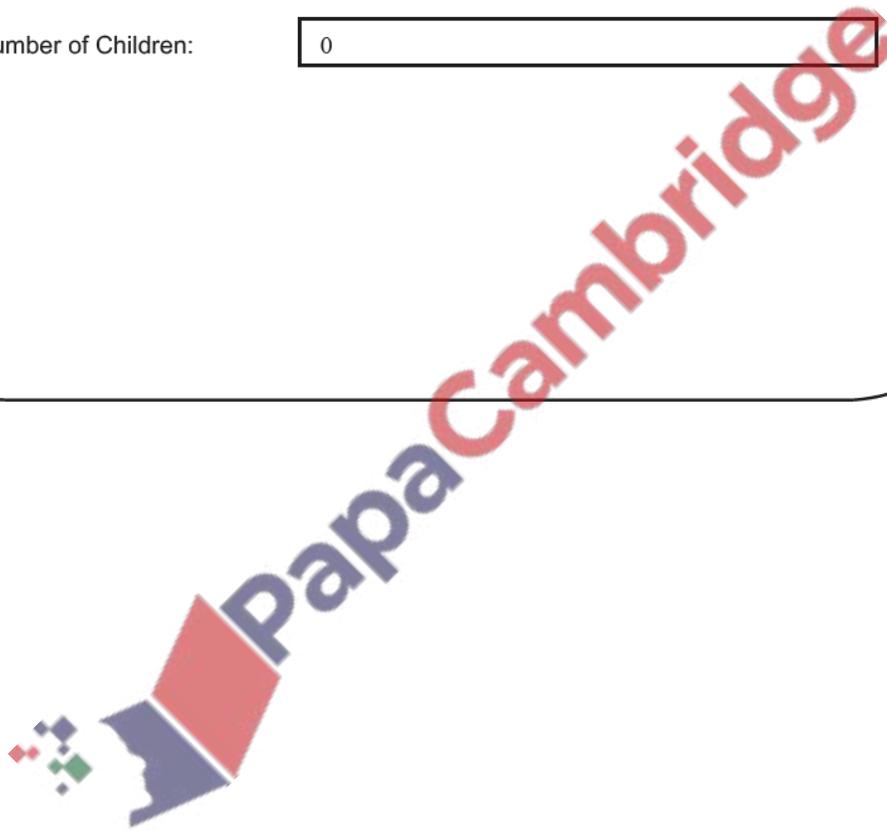
11. Nov/2020/Paper_11/No.5

The Fish Bowl is a large outdoor music arena. It uses an online booking system.

A customer has entered her data into the booking system using an online data entry form.

Name of show	Uni Direction
Date of performance	18th March 2020
Time of performance	7:30 **pm**
Seat position	(Stalls) Circle Upper Circle
Number of Adults:	2
Number of Children:	0

(a) Evaluate this online data entry form.

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(b) When a person makes a booking, a ticket will be produced for each person. The ticket will be sent by email and can then be printed out or used on a smartphone to gain entry to the event.

Design a ticket that includes elements for both visual and electronic checking for the forthcoming music event.

[6]

12.

Autonomous vehicles are being tested on some of the world's roads. These vehicles can travel in convoys with each vehicle following the one in front with a set distance between them. The whole operation is computer controlled. If the vehicle in front slows down, then the following vehicle also slows down to maintain the distance between them.

A proximity sensor is used to detect how close the vehicle is to the vehicle in front.

Describe how the microprocessor would maintain the set distance between the vehicles.

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13.

A teacher is teaching students about history using a virtual reality (VR) system.

(a) Identify **three** devices that could be used with a VR system.

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[3]

(b) The teacher carefully monitors the students' use of the VR system. She only allows them 20 minutes on the device before taking a break. This is to ensure that they remain healthy whilst using it.

Identify **three** health problems associated with the prolonged use of VR systems.

Problem 1 ....

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Problem 2 ....

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Problem 3 ....

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[3]
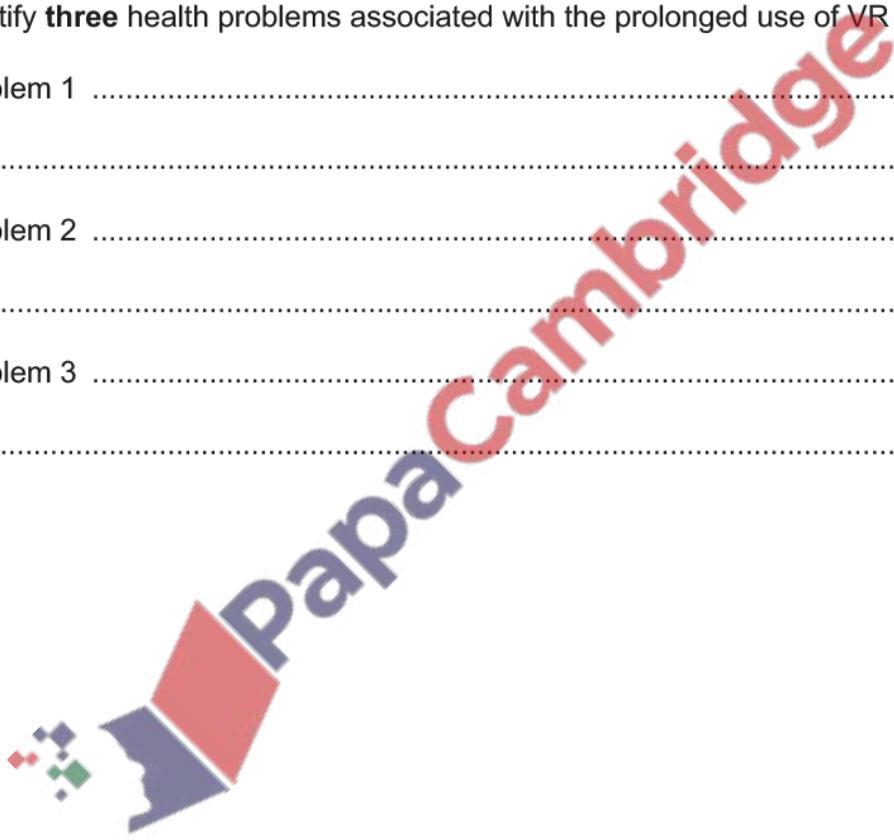
14.

The temperature in a glasshouse is controlled by a computer. A program is being designed to open and close the glasshouse windows. If the temperature is too hot, then the windows will open; otherwise the windows will close.

The systems analyst has produced a number of different instructions to show how the system works. Part of the instructions are shown.

(a) Complete the instructions by writing the most appropriate technical terms to explain how the windows are operated.

- Data is read by the sensor.

- .... data is output from the sensor.

- Data from the sensor is sent to the microprocessor via the ....

  ....

- If the temperature is greater than the ....

- The microprocessor sends a signal to the ....

[4]

(b) Circle the **two** most appropriate input devices associated with the computerised glasshouse.

Chip and PIN reader   Hard Disk Drive   Laser printer

LED monitor   Moisture sensor   Numeric keypad

[2]

17

(c) Another use of computer control is in the manufacture of cars.

Discuss the benefits and drawbacks of using computer-controlled systems rather than humans to build a car.

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Many supermarkets now use the internet and allow customers to buy their products online.

(a) Explain, in detail, the effects that online shopping has had on supermarkets.

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(b) When customers shop online, they can pay using a debit card.

Describe measures that customers could use to reduce fraud when using a debit card online.

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16.

A house contains a microprocessor-controlled central heating system.

(a) Identify **two** input devices that would be used in this system.

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[2]

(b) Describe how a microprocessor would use the data from these devices to control the central heating system.

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17.

The heat times are measured by a computer system, but could be measured by officials with stopwatches.

(d) Discuss the advantages and disadvantages of using computers in measurement rather than humans.

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18.

Autonomous vehicles such as taxis are being tested on the world's roads. This type of taxi is able to drive between two points without the driver having control of the vehicle. The vehicles use satellite navigation and wireless technology with sensors to navigate and control the vehicle.

Evaluate the use of these technologies when navigating and controlling vehicles in this way.

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19.
Chess players can use expert systems to help them practise chess moves.

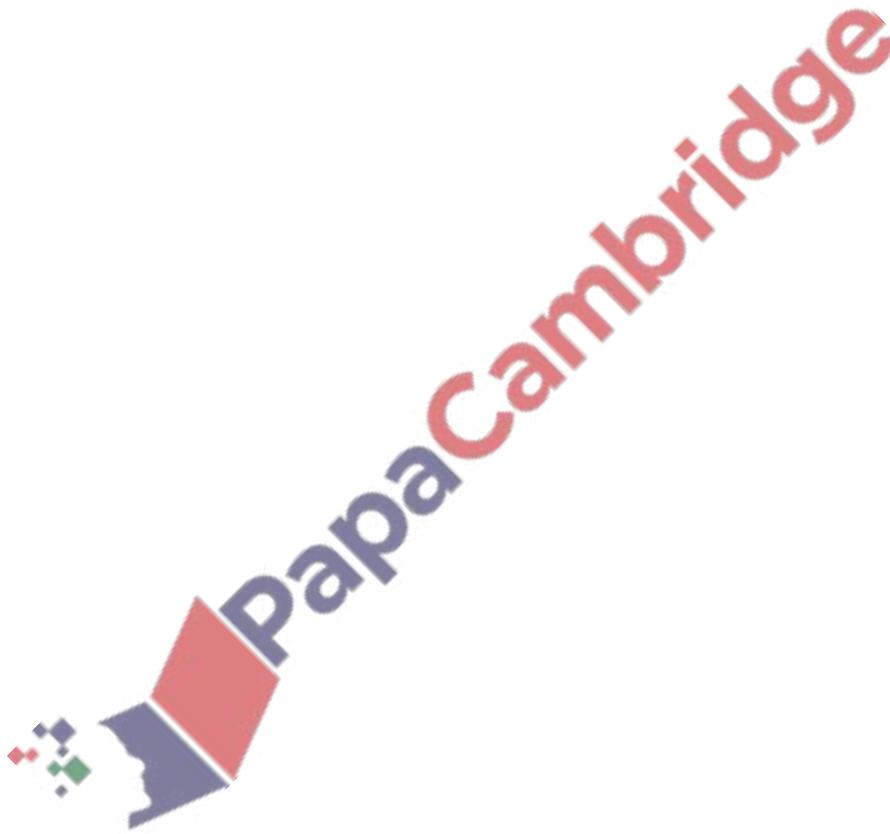Name **two** other applications which involve the use of expert systems.

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[2]

20.

Arjun is taking a gap year between his studies and will be travelling through Kenya. He needs to remain in contact with his parents and is considering using either a cell phone or VoIP.

(a) Describe the benefits of using each of these communication methods to stay in contact with his parents.

Cell phone ....

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VoIP ....

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[4]

(b) From time to time Arjun's parents transfer money from their bank account to his bank account using online banking.

Identify **one** type of transaction they cannot do using online banking.

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(c) When Arjun logs onto his online banking he needs to enter his username and password. The system may also ask him to provide an answer to a security question.

Tick (✓) whether the following are appropriate examples of a security question or not.

	Appropriate (✓)	Not appropriate (✓)
How old are you?		
What is your mother's maiden name?		
What is your PIN?		
Which town were you born in?		

[2]

24

(d) Give **three** benefits of Arjun using online banking in this scenario.

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[3]

(e) Give **two** drawbacks of Arjun using online banking in this scenario.

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[2]

21. Mar/2020/Paper_12/No.11

Robots are used in many car production lines.

Discuss how their use has affected the nature of employment in the car production industry.

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22. Mar/2020/Paper_13/No.9a

People rely heavily on microprocessor-controlled devices in the home.

(a) Describe **two** drawbacks in terms of lifestyle changes this has produced for the users of such devices.

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2 ....

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[2]