

**MARK SCHEME for the October/November 2012 series**

**9713 APPLIED INFORMATION AND  
COMMUNICATION TECHNOLOGY**

**9713/12**

Paper 1 (Written A), maximum raw mark 80

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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1 (a) **Four** from:

cameras to inspect/check work  
welding guns to weld parts of the car body together  
Grippers to pick up/ hold parts (and place them somewhere else)  
Vacuum/suction cups to pick up parts  
spanners to place and tighten nuts  
riveters to place and tighten rivets  
spray guns/sprayer to paint the car body  
polishers/finishers to produce a shiny finish (after painting)  
Sanders to prepare body for painting  
Drills to make holes in the car body

[4]

(b) **Four** from:

the programmer controls the robot by physically guiding the arm through each step using the screwdriver  
the programmer has sensors attached to his/her arm  
the sensors transmit data back to the computer  
The computer stores the whole process of tightening a screw...  
...as a program in its memory.  
The robot arm is therefore able to repeat the actions every time a new unit comes down the assembly line

[4]

(c) **Three** from:

a robot arm has greater accuracy/fewer errors than a human  
there are lower running costs/no need to pay wages/lower utility costs  
work/work rate is of a consistent standard  
the whole process can be continuous/24 hours a day 7 days a week...  
...without having to stop at shift changeovers  
It is a safer/less dangerous environment for humans/Robots can work in harsh/hazardous conditions  
greater productivity

[3]

(d) **Three** from:

Setup/maintenance costs  
Is unable to cope with unusual circumstances/can't think for themselves  
Staff need to be retrained leading to higher costs/which would be costly...  
...and loss of workers for a period of time  
If there is a fault in the program all products will have the fault

[3]

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- 2 (a) Business – advertising of a single company and example [1]  
Product – advertising of a specific product/advertising one item and example [1]  
Service – advertising of services such as insurance/government/tourism/banking [1]  
Most appropriate – business [1]

(b) Four from:

Can be produced by the business using their own PCs and printers  
A flyer doesn't take very long to produce  
Company can distribute them so that they only go to the people they want to see them/target audience  
It is a cheaper method than creating a web page/paying a company to use their website/paying programmers to create a website  
Prospective customers may not have computers/internet/regular electricity supply  
Can target specific groups/Can't guarantee all the intended audience would see a website [4]

3 (a) Five from:

The data flow diagram shows the inputs, outputs and processes of the system  
The specific hardware will not be recommended at this stage.  
Recommendations/suggestions for the hardware will be made.  
DFDs consist of terminators, flow arrows, processes and stores  
the terminators and flow arrows in the DFD show the volume of input data...  
...which leads to decisions on appropriate input devices  
Terminators and flow arrows out of the system indicate the quantity/format of the output/required output...  
...which leads to decisions on appropriate output devices  
looking at the processes involved (in storing and analysing results)...  
...the processing requirements will be known...  
...will give an idea about the size and speed of the processor required  
Stores in the DFD will show how much data needs to be stored...  
...the storage requirements will be known  
How much data needs to be stored is needed to identify the size and number of storage devices [5]

(b) Four from:

Forward and backward buttons to go to the next/previous record/candidate  
First and last buttons to go to the first/last record in the database  
Drop down menus to select a file/record  
Go to button so that the desired record/candidate/centre number can be typed in  
Search button so that the desired candidate/centre name/number can be found [4]

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**3 (c) Three** from:

Use normal and live data for candidate numbers to test the goto/search buttons  
 Use abnormal and extreme data for candidate numbers to test the goto/search buttons  
 Click the buttons to make sure they go to the correct record  
 Check all the options on the drop down menus  
 Get users to check the ease of use of the navigation aids...  
 ...and ask for feedback about the navigation aids

[3]

**(d) Three** matched pairs from:

Parallel running involves running the old system alongside the new system.  
 If there is a problem with the new system still have the old system as a backup/ changes can be made if problems occur/training can be gradual

Phased implementation involves implementing one part of the system while rest of system remains unchanged/implementing system part by part  
 If there is a problem with the new system still have bulk of old system to fall back on/changes can be made if problems occur (if not already awarded for parallel running)/ training can be gradual (if not already awarded for parallel running)

Pilot running involves running new system in one regional office whilst old system still operates in other branches

If there is a problem with the new system only one regional office is affected the other two will be able to carry on as normal/workers using the successfully implemented system could train workers in other branches

[6]

**4 (a) Three** from:

Microphone - to input voices/so that workers can speak with the trainer  
 Speakers - to output voices/in order to hear other examiners/trainer  
 Webcam - to input video/so that images of each examiner can be transmitted/sent

[3]

**(b) Three** from:

Won't have to pay for travelling/hotel expenses (and then wait to be reimbursed)  
 Won't waste time travelling  
 Can organise family commitments around the meeting  
 Won't have to worry about forgetting vital documents  
 Won't have to worry about misplacing examination papers/confidential papers

[3]

**(c) Three** from:

Cannot be sure that all examiners are paying attention  
 Initial cost of video conferencing software  
 Initial cost of hardware at the exam board's offices  
 May be problems with the connection/time lag  
 Difficult to allow participants to answer in turn

[3]

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5 (a) Five from:

Click on register button to take you to the registration page  
 Enter choice of username to identify the customer to the system  
 Enter choice of password to make the account more secure  
 Enter an e-mail address so customer can be sent notification that they have received the order/so shops can tell the customer when the order has been dispatched.  
 Confirm email address/password by entering it again to verify the original one is correct  
 Enter name to ensure that the goods/bill are addressed to the correct person  
 Enter answer to chosen security question as an extra layer of security in addition to a password/so that you can request a new password if the original is forgotten  
 Enter billing address where the bill will be sent  
 Enter a shipping address where the goods will be sent to  
 Enter phone number so customer can be contacted if there is a delay in delivering/amendment to customer's order  
 Give credit card details/debit card details/online transaction service provider details as a method of payment  
 Choose method of delivery to choose how quickly the goods should be delivered  
 Open confirmation email and click on link to confirm registration  
 Click on log off to make sure no person using the machine after you can access/misuse your personal details/credit card details  
 Click on confirm button to authorise the delivery/purchase of goods

[5]

(b) Four from:

Can compare products and prices at their leisure  
 Can shop at a convenient time for them  
 Customers can shop at their favourite store even when they live far away  
 Customers can shop around without having to spend time travelling to different stores  
 Customers can shop around without having to spend money travelling to different stores  
 Disabled customers will find it easier to shop  
 There will be a greater choice of hardware

[4]

(c) Four from:

Less personal touch so it is harder to sell other products  
 Potential for fraud so store loses money  
 Initial/running costs such as having to pay website developers.  
 Initial costs such as buying the hardware when starting up.  
 May need to retrain staff which is costly  
 May lose customers who fear online fraud

[4]

6 (a) Interactive voice response software/software that does not require a human response/automatic services such as account information can be accessed using the IVR software.

**Three** from:

Caller is presented with an options menu  
 Option is selected by pressing the keys on the phonepad/speaking into the phone  
 Customer responds to questions about their account to identify the customer  
 Data and call is automatically routed to the relevant department or person required.

[4]

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**(b) Four** from:

Typing at a keyboard continuously can cause RSI/wrist problems/finger problems  
 Gripping a mouse and repetitive clicking can cause RSI/wrist problems/finger problems/carpal tunnel syndrome  
 Sitting in the same position all day can cause lower back pain  
 Sitting in the same position all day can cause deep vein thrombosis  
 Staring at a computer screen all day can cause eye strain/headaches  
 Poor positioning of screen can cause upper back/neck/shoulder pain  
 Glare from screen can cause eye strain/headaches

[4]

**(c) Three** from:

Too many plugs connected to a socket/overheating of computers can be a fire hazard, have a CO<sub>2</sub> fire extinguisher in the room/don't overload sockets/make sure there are enough sockets in the room/ use LCD monitors/have adequate ventilation/don't place computers too close together/make sure ventilation holes are not blocked  
 Bare wires can cause electrocution, ensure wires are properly insulated/spilt drinks can cause electrocution don't take food and water near to computers  
 Trailing wires could cause an operator to trip over/ensure adequate trunking is in place/place cables under carpet/use WiFi devices

[3]

**7 (a) Two** from:

Gives workers some choice about what times of day they work.  
 Hours can vary from day to day.  
 Workers work the same number of hours each week.  
 Can choose when to do these hours, providing it fits in with what other workers want and employer agrees.

[2]

**(b) Three** from:

Can enable business to be open for longer during the day  
 Business might want the repairs to go on from early in the morning to late at night  
 Can match working hours with busy and not-so-busy times  
 Easier to allow for technicians' personal needs which leads to a reduction in absenteeism/improved punctuality.  
 Working flexitime hours would appeal to many technicians so it helps recruitment/ reduces the number of staff leaving for another job  
 reduces the need for training new staff  
 Working flexitime hours is popular leading to greater productivity

[3]

**(c) Two** from:

Allows technicians to organise their working lives to suit their personal needs.  
 Can choose to work off peak hours as travelling to work outside peak times is easier and cheaper  
 If technicians stay late to finish a job, they can take time off at a later date  
 If the job requires great concentration, it can be done at quiet times of day.

[2]