

**PLEASE NOTE THAT THIS VERSION WAS
UPDATED 27/06/06 AND SUPERCEDES ANY
PREVIOUS VERSION.**

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

Specimen for 2008

GCE A/AS LEVEL

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 9713/01

APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY



UNIVERSITY of CAMBRIDGE
International Examinations

Question Number	Question (including any source details)	Part Mark
1	<p>(a) Two from:</p> <p>A robotic arm has greater accuracy compared with a human There are lower running costs compared to paying a human being Robotic arms do not get tired so work is of a consistent standard The whole process can be continuous without having to stop at shift changeovers</p>	[2]
	<p>(b) 1 mark for each process named (maximum mark of 2) from:</p> <p>Painting the car bodies Putting the car wheels on Drilling holes in car body Fixing rivets to the car body Tightening bolts Assembling the electric circuits in the car Inserting the car engine</p> <p>1 mark for each appropriate expansion (maximum 2):</p> <p>End effectors are attached to robot arm such as – Paint sprayer Drill Riveter Ratchet/spanner Pressure sensors are used to tell the computer whether the effector is being held firmly enough or too firmly</p>	[4]
	<p>(c) Five from:</p> <p>Industrial robots are designed to perform exactly the same task over and over again. The programmer guides the arm through each step using a handheld controller. The computer stores the exact sequence of movements as a program in its memory.</p>	[5]

- 2 (a) 1 for each example + 1 for each expansion from:

Video conferencing + modem/webcams/microphones/each participant can hear and see the others.

Electronic mail + modem/mailings can be sent to all other participants at same time/immediate response possible.

Faxing + fax machine/modem/all in one/legal documents can be sent/signed documents can be sent.

Voice conference + phone/dial a number and type in PIN.

Bulletin board/instant messaging/controlled access chat room + modem/all participants receive the message at the same time/immediate responses are possible.

[4]

- (b) Five from:

Workers - do not have to spend money on fuel/transport travelling to work
do not have the stress of travelling to work in rush hour
can spend more time with their family
can arrange their work schedule to suit themselves
miss the personal contact with colleagues
more difficult to discuss ideas with colleagues

Company - more content workforce
do not have to spend so much on air conditioning/heating
do not have to rent or build large offices/can build or rent smaller offices
do not have to pay travelling expenses for conferences
difficult to keep track of projects
have to subsidise workers' computers

+ 1 mark for reasoned conclusion

[6]

- (c) Six from:

Websites – Have animation/video and sound to attract the audience
Easier to update than flyers/posters
Worldwide audience
Can be expensive to maintain
Easier to link to other sources/websites

Multimedia presentations - Also have animation/video and sound to attract the audience
Also easier to update than flyers/posters

Flyers Cheap to mass produce
Target a specific audience

Posters Cheap to mass produce
Can be damaged/defaced

[6]

3 (a) Five from:

Description of observation
 Description of questionnaires
 Description of interviews
 Description of Examining documents
 Situation where using observation is needed – to see what exactly goes on
 Situation where using questionnaires is advisable – when it is difficult to get people together/to save time
 Situation for using interviews – when there is sufficient time/when it is relatively easy to get people together
 Situation where examining the documents is necessary – where there is lots of paperwork.

+ 1 mark for reasoned conclusion.

[6]

(b) Four from:

Files will be held in an indexed sequential manner
 The index will allow for direct access
 Needed when accessing individual records quickly
 When a person's details are required for human resource/personnel use
 The records will be held sequentially to allow for serial access
 Used to process all records one after the other
 When producing payroll

[4]

(c) Four from:

Batch processing would be used
 Each worker would have an id number
 Hours worked would be sorted in id number order
 Each record on the master file would be read
 Using the details of hourly rate for each worker
 The pay would be calculated
 Taxes would be calculated
 Master file would be updated
 Details would be printed out on each individual payslip

[4]

(d) Three from:

Data must be:
 Fairly and lawfully processed
 Processed for limited purposes
 Adequate, relevant and not excessive
 Accurate and up to date
 Not kept longer than necessary
 Processed in accordance with the individual's rights
 Not transferred to countries outside that country unless it has adequate protection for the individual interests of the individual or another person

[3]

(e) 6 marks maximum from:

Data protection is necessary because -

Personal data is kept on computers – 1 mark

such as names/addresses/financial information/medical records/criminal records/employment history – 1 mark for at least 3 items

Searches of databases for personal information are much faster with computers than if it is stored on paper – 1 mark

These computers can be linked to communications networks like the Internet or private company networks – 1 mark

This allows databases to be used across an organisation/be shared between organisations very quickly – 1 mark

With more and more organisations using computers there is a danger the information could be misused or could get into the wrong hands – 1 mark

Data can be easily copied – 1 mark

Data can be changed with little evidence being left – 1 mark

Without data protection rules -

People who are not supposed to could see the information – 1 mark

Data might not be accurate – 1 mark

It could be possible to build up detailed files on people without their knowledge or permission – 1 mark

[6]

4 (a) **Three** from:

Modem to connect to the system/Internet

Mouse to select products

Keyboard to type in username/password

Internet browser to connect to the service

[3]

(b) **Five** from:

Increased unemployment for some existing checkout operators

Increased employment for technical staff

Some checkout operators will have a more menial role

Increased employment for van drivers

Some workers may have to/will have the opportunity to go part time

There will be the opportunity to job share

There will be flexible working hours

Technical staff may be able to work from home

[5]

(c) **Four** from:

May not have a credit card

Credit card details may be intercepted by hackers

Hackers would need to know username and password

Most systems are extremely difficult to hack into contrary to popular belief

Data is encrypted when being transmitted

Impossible to crack the encryption without a key.

+ 1 mark for a reasoned conclusion

[5]

(d) Three from:

RSI due to continuous keying in of data
 Headaches/sight problems due to continuously staring at the screen
 Backache due to continuously remaining seated in same position
 Danger of electrocution - if drinking near power sockets/ wires are left trailing
 Danger of fire - if sockets are overloaded/equipment allowed to overheat

[3]**5 (a) Four from:**

Choice of output devices will depend on the volume of data/quality required
 Choice of storage devices will depend on the order that data will be output
 Design of data collection forms/screen layouts will depend on the user requirements/output required from system/file structures
 Design of report layouts/screen displays will depend on the requirements of the users
 Design of validation routines will depend on the form of the input/file structures
 Design of data/file structures and programming specifications will depend on types of processing required/structure of output/input

[4]**(b) Six from:**

Mouse for choosing options from a menu
 Keyboard for typing up coursework/classwork notes
 Overlay/concept keyboard for selecting special characters/options
 Overlay/concept keyboard for disabled students
 Touch screen for selecting menu options
 Trackerball for disabled students
 Web browsing software for accessing educational software on the Internet
 Specially written CBL/CAL software to make learning enjoyable
 Overlay software to facilitate the use of the overlay/concept keyboard
 Spreadsheets/Graphics software for producing graphs in Science/Maths
 Word processing/DTP/Presentation software for producing coursework

[6]**(c) Three from:**

Memory sticks are small and easy to carry and hold a lot of data
 Floppy discs are small and easy to carry but do not hold a lot of data
 CD RW are rather more bulky but do hold a lot of data
 Email – no need to carry work around/may be size limit on attachments

+ 1 mark for a reasoned conclusion

[4]