PLEASE NOTE THAT THIS VERSION WAS UPDATED 27/06/06 AND SUPERCEDES ANY PREVIOUS VERSION.
### MARK SCHEME

<table>
<thead>
<tr>
<th>MAXIMUM MARK: 80</th>
</tr>
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<tbody>
<tr>
<td>SYLLABUS/COMPONENT: 9713/01</td>
</tr>
<tr>
<td>APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY</td>
</tr>
</tbody>
</table>
(a) Two from:

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

(b) 1 mark for each process named (maximum mark of 2) from:

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

1 mark for each appropriate expansion (maximum 2):

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

(c) Five from:

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.
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.

(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

(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

(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
(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

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

(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

(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