APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY **9713/13**

Paper 1 Written A **October/November 2016**

MARK SCHEME

Maximum Mark: 80

Published

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 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

1 (a) *Three* matched pairs from:

Laser printer produces high quality hard copy by using toner
Used to print out projects/coursework

Inkjet printer produces high quality hard copy by spraying ink onto paper
Allows photo quality output of pictures to be included in the project/for draft quality of first attempts of work

3D printer to produce solid, physical outputs/objects/models by allowing layers of material to be produced
Allows students to print solid objects/models for technology projects e.g. solid representation of a design from a CAD application

Wide format printer uses inkjet technology on large size paper
Used to produce printouts of projects produced in Art **[6]**

(b) (i) *Four* from:

Magnetic stripe cards are susceptible to magnetic interference which can wipe the data on them
This can come from close proximity to a mobile phone
If the card is lost/damaged/stolen/forgotten/misplaced student cannot enter the college
If the card is lost/damaged/stolen/forgotten/misplaced student cannot access services from the college
If the reader malfunctions student cannot enter the college
If stolen it can be used by unauthorised person/other student to enter the college or to access services from the college
Can cause queues at entry points to the college because students have to find and use the card **[4]**

(ii) *Five* from:

College authorities know how many students are present at any time (if card is also used for exit)...
… important for emergencies e.g. fire drills
College could use it for individual student attendance records
Students could use card to pay for purchases like food, trips and books
College authorities could collect information on which resources are being used/not used by students…
…to know the times of day when the library is heavily used
Students could use cards to borrow books from library
College can grant different access rights/privileges to groups of students
College could keep records of which students have borrowed equipment/resources

[5]

(c) *Six* from:

If the author's credentials are good it is likely to be reliable
Check the URL, does it end with .gov or .ac or .ed which usually indicates reliability…
.co or .com at the end of the website address indicates that it is a commercial site and is likely to be biased
Compare information with other sites/other reliable books/text books
Check when the site was last updated – if the date of the last update was a long time ago it is likely to be unreliable
If site has excessive advertising it could be unreliable/if the advertising is related only to its own products it could be unreliable
If site is endorsed by reliable/reputable people/organisations it can be accepted as being reliable/if it has links to other reliable sites/ sites which have testimonials it is usually reliable/if it has testimonials it is likely to be reliable
Sites which have grammatical/spelling mistakes are likely to be unreliable
If it has been recommended by teachers it is likely to be reliable **[6]**

2 *Six* from:

Proof read and correct the document to ensure that it makes sense
Check for accuracy of description of equipment available and its use
Check for consistency of line spacing/character spacing to make sure that the distance between lines/paragraphs/characters is standard
Check lists/tables/charts are not split over two pages
Check that there are no widows or orphans produced; no single lines from a paragraph/list are at the top or bottom of pages without the rest of the text
Ensure that tables and charts fit boundaries of page/columns accurately
Use spellchecker to find misspelled words
Use grammar checker to ensure that document adheres to syntax of language **[6]**

3 (a) *Five* from:

Database to store details of customers and their requirements
Graphics software allowing the company to create illustrations to use in the webpages
Web authoring software to allow the company to produce webpages into which the assets can be set for customers
Text editing software to type up html markup
Animation production software to create animated images/cartoons as assets for illustrative purposes
Image editing to transform assets so that they fit the requirements of the page **[5]**

(b) (i) *Two* from:

User Ids and passwords so that those who do not know the password are denied access
Encryption so that those who do not have the correct decryption key are
unable/understand to read the information accessed
Memorable data – something only the staff member knows used in conjunction with
User Id **[2]**

(b) (ii) Duty of confidence **[1]**
Duty of fidelity **[1]**
Anonymised information **[1]**
Aggregated information **[1]**
Data protection legislation **[1]**

4 (a) *Two* matched pairs from:

A robot arm has greater accuracy/fewer errors than a human…
…is able to reach a specific programmed position with a minimum of errors/sensors measure
variables more accurately than the human eye

There are lower running costs…
…after robots are paid for, there is no need to pay wages to the workers they have
replaced/there are lower utility costs

Work/work rate is of a consistent standard…
…they do not get tired and make mistakes

It is a safer/less dangerous environment for humans…
…robots are able to work in harsh/hazardous conditions meaning that humans don't have to

The whole process can be continuous/24 hours a day 7 days a week…
….without having to stop at shift changeovers

Robots have greater productivity…
…robots can produce a greater quantity of products in a given period of time **[4]**

(b) *Four from:*

The programmer controls the robot by physically guiding the arm through each step using the drill
The programmer has sensors attached to his/her arm
The sensors transmit data to the computer
The computer stores the sequence of movements…
…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]**

5 (a) *Three matched pairs from:*

Parallel running:
The old and new systems are run at the same time
Computerised production of Yaravan and normal workforce production are run together until the robot system has no bugs

Direct changeover:
The new system replaces the old system immediately
The old production line is shut down and the new one is installed in one go

Phased implementation:
Implementing one part of the system while rest of system remains unchanged/implementing system part by part
The cars continue to be produced by the workforce but are painted by robots **[6]**

(b) *Six from:*

Advantages:

It is a safer/less dangerous/less hazardous environment for humans
The work areas are cleaner
Jobs are less boring
Don't have to lift heavy weights

Disadvantages:

Unemployment
Will have to re-train in order to keep a job
Loss of social interaction with other workers
Deskilling can occur **[6]**

6 **(a)** *Four from:*

Bar chart:

Individual <u>values can be read from the axis</u>/<u>no meaning to intermediate values</u>/emphasises <u>differences from one block to another</u>

Pie chart:

Small number of segments used to show <u>relative</u> sizes/actual numerical values are not important

Comparative bar chart:

Differences between figures for different institutions AND between different years <u>are easier to see</u>

Line graph:

Shows <u>the trend</u> from one year to the next making extrapolation possible **[4]**

(b) *Three from:*

Staring at a computer <u>screen</u> **<u>continuously</u>** can cause problems with one's sight
Typing at a keyboard **<u>continuously</u>** can cause RSI
Gripping a mouse and **<u>repetitive</u>** clicking can cause carpal tunnel syndrome/RSI
Sitting in the **<u>same position/with wrong posture all day</u>** can cause lower back pain
Staring at a computer screen **<u>all day</u>** can cause eye strain/headaches
<u>Poor positioning</u> of screen can cause upper back/neck/shoulder pain/eyestrain/headaches
<u>Glare</u> from screen can cause eye strain/headaches **[3]**

7 **(a)** *Eight from:*

Sequential filing is when the records are stored in order
Sequential – all records are read when the update to the files is carried out
Sequential – individual records may be slower to find
Sequential – individual records may take longer to edit
The only way to add new records to a sequential file is to store them at the end of the file
Sequential – a record can only be replaced if the new record is exactly the same length as the original
Sequential – records can only be updated if the data item used to replace the existing data is exactly the same length
The processing of records in a sequential file is slower than with other types of file
Random access filing is when the records are stored in no particular order…
… makes querying a single record easier
Random access filing – no need to keep a transaction file as changes can be made as and when they happen **[8]**

(b) *Six from:*

The transaction file is sorted in the same order as the master file
First record in the transaction file read
Reads first record in the old master file
These two records are compared
If records don't match computer writes master file record to new master file
If it matches transaction is carried out

Then
If transaction relates to calculation of pay:

Computer calculates the pay
Using rate of pay from master file
Using hours worked from transaction file
Computer calculates the income tax/insurance/pension contributions
Computer subtracts this from total pay
Processed record is written to master file
Process is repeated until end of old master file

If transaction relates to deletion, amendment or insertion:

If deletion or amendment old master file record not written to file
If amendment/insertion data in transaction file written to master file
Process is repeated until end of old master file
Processed record is written to master file **[6]**