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**APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/13**

Paper 1 Written A

**October/November 2016**

MARK SCHEME

Maximum Mark: 80

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**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.

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Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level components and some Cambridge O Level components.

<b>Page 2</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>Cambridge International AS/A Level – October/November 2016</b>	<b>9713</b>	<b>13</b>

**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]**

<b>Page 3</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>Cambridge International AS/A Level – October/November 2016</b>	<b>9713</b>	<b>13</b>

**(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>Page 4</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>Cambridge International AS/A Level – October/November 2016</b>	<b>9713</b>	<b>13</b>

**(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]

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2016	9713	13

**(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]

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2016	9713	13

6 (a) **Four from:**

*Bar chart:*

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

*Pie chart:*

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

*Comparative bar chart:*

Differences between figures for different institutions AND between different years are easier to see

*Line graph:*

Shows the trend from one year to the next making extrapolation possible [4]

(b) **Three from:**

Staring at a computer screen continuously can cause problems with one's sight

Typing at a keyboard continuously can cause RSI

Gripping a mouse and repetitive clicking can cause carpal tunnel syndrome/RSI

Sitting in the same position/with wrong posture all day can cause lower back pain

Staring at a computer screen all day can cause eye strain/headaches

Poor positioning of screen can cause upper back/neck/shoulder pain/eyestrain/headaches

Glare 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]

Page 7	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2016	9713	13

(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]