UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2009 question paper for the guidance of teachers

0417 INFORMATION TECHNOLOGY

0417/01 Paper 1 (Written), maximum raw mark 120

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.

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Question Number	Answer	Part mark
1	**A** Scanner **B** Dot matrix printer **C** Hard disc drive **D** Graphics tablet **E** Multimedia projector	[1] [1] [1] [1] [1]
2	**Bar code reader** **Keyboard** **Laser printer** **Memory Stick** **Mouse** **Zip disc drive**	[1] [1]
3	True / False Dot matrix printers produce high quality output – False ✓ Laser printers are very noisy – False ✓ Graph plotters are used when extremely large hard copy is required – True ✓ Inkjet printers are used where continuous stationery is required – False ✓	[1] [1] [1] [1]
4 (a) (b) (c) (d)	A mouse A bank cheque A memory stick A microphone	[1] [1] [1] [1]
5	True / False RAM is not volatile – False ✓ ROM is used to store the BIOS of a computer – True ✓ The data in ROM is easier to change than that in RAM – False ✓ RAM is used to store the data the user is currently working on – True ✓	[1] [1] [1] [1]
6	Triangle: 1 mark for a correct loop e.g. **REPEAT 3, END REPEAT** 1 mark for **RIGHT** 120 Backward sequence 1 mark for **PENUP, BACKWARD 80, PENDOWN** Square: 1 mark for a correct loop e.g. **REPEAT 4, END REPEAT** 1 mark for **FORWARD 100** coming immediately after **RIGHT 90 as given**	[5]

7

	Health	Safety	
Headaches caused by prolonged use	✓		**[1]**
Trailing wires in a computer room		✓	**[1]**
RSI though continual typing	✓		**[1]**
Back problems through bad posture	✓		**[1]**
Too many plugs in an electric socket		✓	**[1]**
Drinking water whilst using a computer		✓	**[1]**

8

Producing utility bills		
Paying for goods at an EFTPOS terminal	✓	**[1]**
Making an airline booking	✓	**[1]**
Producing monthly payrolls		
Monitoring a patient's condition in a hospital	✓	**[1]**
Reading data from bank cheques		

9 (a)

Four from
ID number/Borrower number
Photo of borrower
Name
Address
Post code
Email address
Gender/Title
Date of Birth
Max. two from:
Home Phone number
Work Phone number
Mobile Phone number

[4]

(b)

Four from:
Data fills the screen
Clearly defined input area for each record
Appropriate spacing for each field
Back button/arrow/previous record facility
Forward button/arrow/next record facility
Number of record is on screen
Submit button/facility
First record button/facility
Last record button/facility
An easy to read font/font size/
A sensible font colour/background colour
Easy to follow instructions for completing screen/help icon
No overlapping of items
Exit button/return to homepage button/facility **[4]**

(c)

Double entry/data entered twice **[1]**
computer compares the two versions **[1]**

Visual checking/verification **[1]**
Typed in data is compared with original data **[1]**

(d)

Three from
Normal data is data which is within an acceptable range/ is usual for the situation **[1]**
Any example between 1 and 6 **[1]**

Extreme data is data which is at either end of a normal range of data **[1]**
Examples: 1, 6 **[1]**

Abnormal data is data which is outside the acceptable range/is of the wrong data type **[1]**
Example: any negative number or number greater than 6 or text example **[1]**

(e)

Improvements can be made	✓
The hardware and software can be specified	
Limitations of the system can be identified	✓
To see how many books are required	
To make sure the user is satisfied with the system	✓
So that program coding can be written	

[1] **[1]** **[1]**

(f)

Technical
Three from:
Program listing
Programming language
Flowchart/algorithm
List of variables
File structure
Purpose of the system/program
Input format or example
Output format or example
Hardware requirements
Software requirements
Sample runs/test runs
Known bugs/possible errors
Validation rules

[3 max]

User
Three from:
How to load software/run software/install software.
How to save a file.
How to search
How to sort
How to print
How to add records
How to delete/edit records
Purpose of the system/program (only if not mentioned in technical documentation)
Input format or example (only if not mentioned in technical documentation)
Output format or example (only if not mentioned in technical documentation)
Hardware requirements (only if not mentioned in technical documentation)
Software requirements (only if not mentioned in technical documentation)
Sample runs (only if not mentioned in technical documentation)
Error messages (only if not mentioned in technical documentation)
Error handling
Tutorials
Troubleshooting guide/Contact details/help line/FAQ

[3 max]

10

The customer types in the PIN	**3**	**[1]**
If the PIN and the number stored in the chip are the same go onto the next step	**5**	**[1]**
The customer's account is checked to see if it has sufficient funds	**7**	**[1]**
The card is inserted into the reader	***1***	
The PIN number is compared with that stored in the chip	**4**	**[1]**
The transaction is authorized	**8**	**[1]**
The device checks if the card is valid	**2**	**[1]**
The supermarket computer contacts the customer's bank computer	**6**	**[1]**

[Total: 7]

11 (a)	**Six** from: Interactive user screen appears Details of car type are entered Questions about engine problems are asked/on-board computer connected to expert system Answers to questions/engine problems are typed in Inference engine searches Searches the Knowledge base using the Rules (base) Suggested probabilities of faults are output In the form of a report to the mechanic/on screen output	**[6]**
(b)	**Two** from: Medical diagnosis Mineral prospecting Chess games Plant identification Animal identification Tax advice Careers advice/guidance Insurance Drug efficacy	**[2]**
12 (a)		

Pressure sensor	✓
Proximity sensor	
Temperature sensor	✓
Oxygen sensor	

		[1] **[1]**
(b)	Computers work in digital Sensors produce analogue data	**[1]** **[1]**
(c)	**Five** from: Microprocessor continually monitors sensors Data is converted from analogue to digital/ADC is used Compares water level with pre-programmed value If water level reached microprocessor switches off valve Else valve left on/switched on Compares temperature with pre-programmed value If temperature higher microprocessor switches off heater Else heater left on/switched on Compares weight of clothes with pre-programmed value If clothes too heavy microprocessor sounds alarm/stops machine/motor stops running Else cycle continues/motor starts	**[5]**

	(d)	**Four** from: Microprocessor controlled devices do much of housework Do not need to do many things manually Do not need to be in the house when food is cooking Do not need to be in the house when clothes are being washed Can leave their home to go shopping/work at any time of the day Greater social interaction/more family time More time to go out/more leisure time/more time to do other things/work Are able to do other leisure activities when convenient to them Can lead to unhealthy eating due to dependency on ready meals Can lead to laziness/lack of fitness Can encourage a healthy lifestyle because of smart fridges analyzing food constituents	**[4]**
13	**(a)**	**Two** from: Modem Router Or any other suitable answer	**[2]**
	(b)	**Five** from: WAN is a wide area network WAN covers a large geographical area/worldwide The Internet is a WAN LAN is a Local Area Network LAN covers a small area such as one building/A school network is a LAN A WAN consists of connected LANs More difficult to share peripherals using a WAN	**[5]**
14	**(a)**	4	**[1]**
	(b)	5	**[1]**
	(c)	Product type	**[1]**
	(d)	Mupe	**[1]**
	(e)	Bar code	**[1]**
	(f)	Range check **Two** from: Values less than 0 (or 'lower limit') or more than an upper limit Will be rejected/not allowed/must be within A correct example can be awarded both marks	**[1]** **[2]**
15			

Graph plotter	
Trackerball	
Microphone	✓ **[1]**
Speakers	✓ **[1]**
Optical mark reader	
Web cam	✓ **[1]**

16	**Three** from User ID/Passwords/PIN User ID/Password/PIN entered is compared with that held on system/never tell anyone your password/regularly change password/make it not easy to guess/only person who knows password can access account Encryption Data is scrambled up/key must be known to unscramble it/prevents people from understanding data Firewall Prevents unauthorised users/computers from accessing network Digital certificates Transactions are digitally signed/authenticated/transaction is linked to the PC being used to carry out online banking Anti Spyware Prevents spyware from invading your computer and gaining personal information Make sure website is secure Locked padlock is present on display	**[1]** **[1]** **[1]** **[1]** **[1]** **[1]** **[1]** **[1]** **[1]** **[1]**
	[Total: 6 max]	
17	**Eight** from: Drawbacks: Not all information is accurate Some information is purely for advertising/selling purposes Might need proxy server to prevent access to certain types of site Some information is pornographic Anyone can put information on the Internet Much of the information on the Internet is not filtered Need to identify the validity of the author Need to be careful about whether information is fact or opinion Information can be biased Results from search engine could be skewed because of sponsorship/marketing Internet is not policed So much information available which might be unreliable Benefits: Wide range of information to select (desirable/reliable information) Able to search quickly (using search engines) to find (reliable/desirable) information Information can be downloaded and edited (to make it desirable/reliable) Can use the final part of a URL to identify reliability Information can be up to date/real time so reliable .ac, .gov, .org are usually fairly reliable Can compare information from sites to see if it is reliable	**[8]**