Cambridge International AS & A Level

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Cambridge International Advanced Subsidiary and Advanced Level

COMPUTER SCIENCE **9608/13**

Paper 1 Written Paper **May/June 2017**

MARK SCHEME

Maximum Mark: 75

Published

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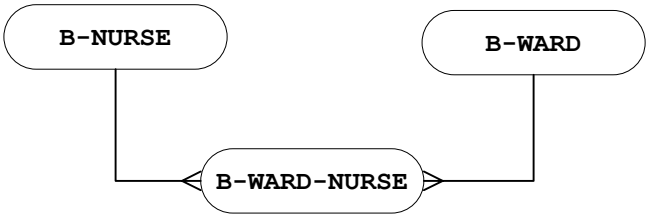
Question	Answer	Marks
1(a)	Many-to-one	**1**
1(b)(i)	A-NURSE(NurseID, FirstName, FamilyName, **WardName**)	**1**
1(b)(ii)	The primary key WardName in the A-WARD table … 1 … links to the foreign key WardName in the A-NURSE table. 1	**2**
1(c)(i)	Many-to-many relationship	**1**
1(c)(ii)	B-WARD-NURSE(WardName, NurseID) Both attributes (with no additions) 1 Joint primary key correctly underlined 1	**2**
1(c)(iii)	 Correct relationship between B-NURSE and B-WARD-NURSE 1 Correct relationship between B-WARD and B-WARD-NURSE 1	**2**
1(d)(i)	SELECT NurseID, FamilyName 1 FROM B-NURSE 1 WHERE Specialism = 'THEATRE'; 1	**3**
1(d)(ii)	UPDATE **B-NURSE** 1 SET **FamilyName = 'Chi'** 1 WHERE **NurseID = '076';** 1	**3**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(a)(i)</td><td>
<table>
<tr><td>1</td><td>A laser beam and a rotating mirror are used to draw an image of the page on the photosensitive drum.</td></tr>
<tr><td>2</td><td>C // The image is converted on the drum into an electrostatic charge.</td></tr>
<tr><td>3</td><td>Electrostatic charge attracts toner.</td></tr>
<tr><td>4</td><td>The charged paper is rolled against the drum.</td></tr>
<tr><td>5</td><td>D // The oppositely-charged paper picks up the toner particles from the drum. After picking up the toner, the paper is discharged to stop it clinging to the drum.</td></tr>
<tr><td>6</td><td>A // The paper passes through a fuser, which heats up the paper. The toner melts and forms a permanent image on the paper.</td></tr>
<tr><td>7</td><td>B // The electrical charge is removed from the drum and the excess toner is collected.</td></tr>
</table>
C in the correct place 1
DA, 1
AB 1
</td><td>3</td></tr>
<tr><td>2(a)(ii)</td><td>Inkjet printer</td><td>1</td></tr>
<tr><td>2(b)</td><td>Hard disk drive // HDD 1
Solid state drive //SSD // flash memory 1
One from:
Hard disk
Inexpensive per unit of storage 1
Larger storage capacity than flash drive 1

Solid state storage
No moving parts / noise 1
Robust 1
Low latency // Fast read/write time 1</td><td>3</td></tr>
</table>

Question	Answer	Marks
3(a)	*Sampling rate* The number of samples taken per unit time // the number of times the amplitude is measured per unit time 1 Increasing the sampling rate will increase the accuracy / precision of the digitised sound // Increasing the sampling rate will result in smaller quantisation errors. 1	**2**
3(b)(i)	*Pixel* Smallest picture element which can be drawn 1 *Screen resolution* The number of pixels which can be viewed horizontally and vertically on the screen // or by example - A typical screen resolution is 1680 pixels · 1080 pixels. 1	**2**
3(b)(ii)	8	**1**
3(b)(iii)	*Working*: **Max two** from: Number of pixels is 2048 · 512 1 One pixel will be stored as one byte 1 Number of kilobytes = (2048 · 512) / 1024 1 *Answer:* **One** mark: Number of kilobytes = 1024 KB 1	**3**
3(b)(iv)	**One** from: Confirmation that the file is a BMP 1 File size 1 Location/offset of image data within the file 1 Dimensions of the image in pixels // image resolution 1 Colour depth (bits per pixel) 1 Type of compression used, if any 1	**1**

Question	Answer	Marks
4(a)(i)	500	**1**
4(a)(ii)	496	**1**
4(a)(iii)	502	**1**
4(a)(iv)	86	**1**
4(b)	0 0 0 0 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 0 1 1 0 0 1 1 0 0 0 0 1 Both correct op codes 1 Operand 0001 0001 1 Operand 0110 0001 1	**3**
4(c)	256	**1**
4(d)(i)	07 C2 07 1 C2 1	**2**
4(d)(ii)	LDI 63 LDI 1 63 1	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)(i)</td><td>Count the number of one bits in the <u>first seven</u> bit positions 1
Add a 0 or 1 to bit position 0, to make the count of one bits an <u>odd</u> number 1</td><td>2</td></tr>
<tr><td>5(a)(ii)</td><td>A = 1
B = 1</td><td>1</td></tr>
<tr><td>5(a)(iii)</td><td><u>Two</u> from:

A parity bit is worked out for each <u>column</u> 1
The computer checks the parity of each bit position in parity byte // the computer generates copy of the parity byte and <u>compares</u> 1
If incorrect parity then there is an error in the data received // No parity error means no error in the data received 1
The position of the incorrect bit can be determined 1</td><td>2</td></tr>
<tr><td>5(b)(i)</td><td>
<table>
<tr><th colspan="8">Bit position</th></tr>
<tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr>
<tr><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
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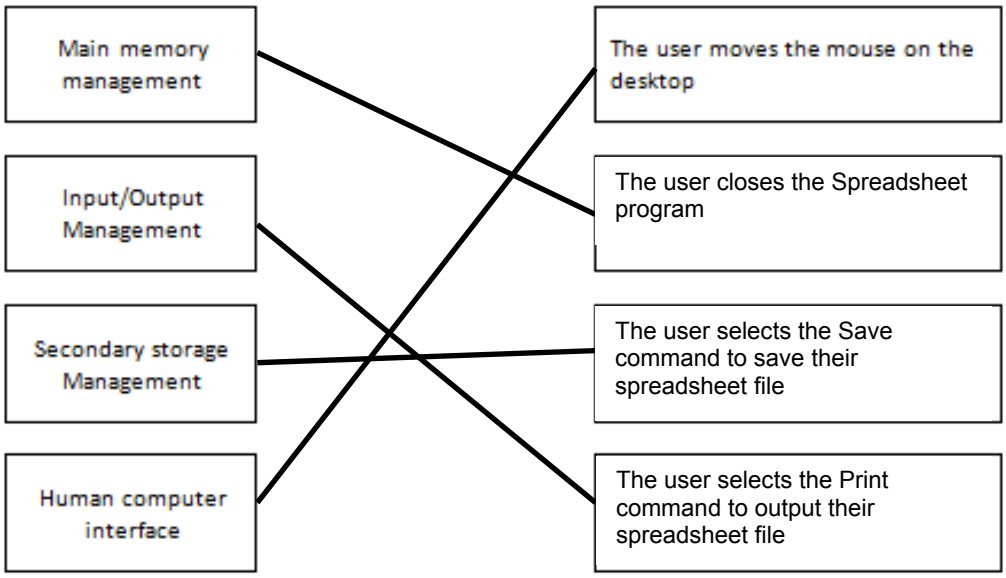
</table>
<table>
<tr><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr>
</table>
</td><td>2</td></tr>
<tr><td>5(b)(ii)</td><td><u>Three</u> from:

Consider each row in sequence 1
Identify any row with incorrect parity 1
Repeat the process for each column in sequence 1
Identify where a row and column with incorrect parity intersect 1</td><td>3</td></tr>
</table>

Question	Answer	Marks
6(a)	 **One** mark for each correct line from each left hand box **to max three** marks.	**3**
6(b)(i)	File compression software	**1**
6(b)(ii)	Backup software	**1**
6(b)(iii)	Disk repair software	**1**
6(b)(iv)	Anti-virus software	**1**

Question	Answer	Marks
7(a)	**Two** from: The user's web browser is the client software 1 The requested web page has program code / script embedded within it 1 This code is interpreted by the web browser 1	**2**
7(b)	**Four** from: The browser parses the URL to obtain the Domain Name 1 The browser software passes the Domain Name to the nearest Domain Name Server (DNS) 1 The DNS stores a list of Domain Names and matching IP addresses 1 The DNS Name Resolver looks for the Domain Name in its database 1 If found the corresponding IP address is returned to the originator 1 If not found the request is forwarded to another higher level DNS 1 The original DNS adds the returned IP address to its cache 1 The original DNS returns the IP address to the originator 1 The browser uses the IP address to request the required web page from the web server 1 The web server retrieves the page and delivers it to the originator 1 The browser software interprets the script and displays the web page 1	**Max 4**
7(c)(i)	Message1, Message2 1 x 1	**2**
7(c)(ii)	6 – 19	**1**
7(c)(iii)	11	**1**
7(c)(iv)	Checks that the product code has not be left blank // presence check on product code	**1**
7(c)(v)	**Two** checks from: **One** mark for check and **one** mark for description Range check 1 Check the number entered is (say) between 1 and 100 1 Format check 1 Checks the product code is a particular format // Checks the number has digit characters only // by example 1 Length check 1 The number of items has exactly five characters 1 Existence check 1 To ensure the product code has been assigned 1	**Max 4**