
COMPUTER SCIENCE**9608/13**

Paper 1 Written Paper

May/June 2017

MARK SCHEME

Maximum Mark: 75

Published

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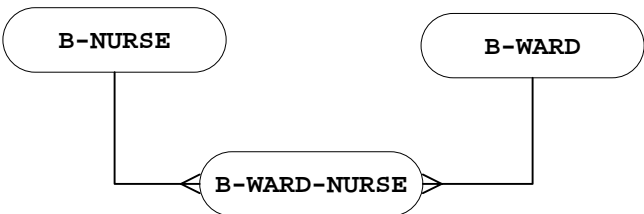
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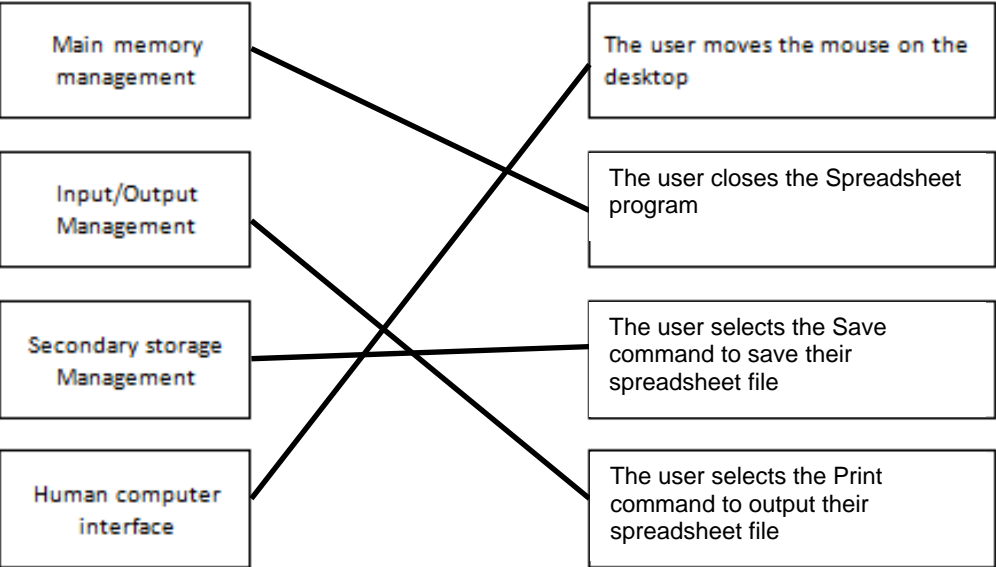
Question	Answer	Marks
1(a)	Many-to-one	1
1(b)(i)	A-NURSE(<u>NurseID</u> , FirstName, FamilyName, WardName)	1
1(b)(ii)	<ul style="list-style-type: none"> The primary key <u>WardName</u> in the A-WARD table links to the foreign key <u>WardName</u> in the A-NURSE table. 	1 1
1(c)(i)	Many-to-many relationship	1
1(c)(ii)	B-WARD-NURSE(<u>WardName</u> , <u>NurseID</u>)	
	Both attributes (with no additions)	1
	Joint primary key correctly underlined	1
1(c)(iii)	 <p>Correct relationship between B-NURSE and B-WARD-NURSE</p> <p>Correct relationship between B-WARD and B-WARD-NURSE</p>	1 1
1(d)(i)	<pre>SELECT NurseID, FamilyName FROM B-NURSE WHERE Specialism = 'THEATRE';</pre>	1 1 1
1(d)(ii)	<pre>UPDATE B-NURSE SET FamilyName = 'Chi' WHERE NurseID = '076';</pre>	1 1 1

Question	Answer	Marks														
2(a)(i)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">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 style="text-align: center;">2</td> <td>C // The image is converted on the drum into an electrostatic charge.</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Electrostatic charge attracts toner.</td> </tr> <tr> <td style="text-align: center;">4</td> <td>The charged paper is rolled against the drum.</td> </tr> <tr> <td style="text-align: center;">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 style="text-align: center;">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 style="text-align: center;">7</td> <td>B // The electrical charge is removed from the drum and the excess toner is collected.</td> </tr> </table> <p style="margin-top: 10px;">C in the correct place 1 DA, 1 AB 1</p>	1	A laser beam and a rotating mirror are used to draw an image of the page on the photosensitive drum.	2	C // The image is converted on the drum into an electrostatic charge.	3	Electrostatic charge attracts toner.	4	The charged paper is rolled against the drum.	5	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.	6	A // The paper passes through a fuser, which heats up the paper. The toner melts and forms a permanent image on the paper.	7	B // The electrical charge is removed from the drum and the excess toner is collected.	3
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2(a)(ii)	Inkjet printer	1														
2(b)	<p>Hard disk drive // HDD 1 Solid state drive //SSD // flash memory 1 One from: <i>Hard disk</i> Inexpensive per unit of storage 1 Larger storage capacity than flash drive 1</p> <p><i>Solid state storage</i> No moving parts / noise 1 Robust 1 Low latency // Fast read/write time 1</p>	3														

Question	Answer	Marks
3(a)	<p><i>Sampling rate</i></p> <p>The <u>number of samples</u> taken <u>per unit time</u> // the number of times the amplitude is measured <u>per unit time</u></p> <p>Increasing the sampling rate will increase the accuracy / precision of the digitised sound // Increasing the sampling rate will result in smaller quantisation errors.</p>	<p>2</p> <p>1</p> <p>1</p>
3(b)(i)	<p><i>Pixel</i></p> <p>Smallest picture element which can be drawn</p> <p><i>Screen resolution</i></p> <p>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.</p>	<p>2</p> <p>1</p> <p>1</p>
3(b)(ii)	8	1
3(b)(iii)	<p><i>Working: Max two from:</i></p> <ul style="list-style-type: none"> • Number of pixels is 2048×512 • One pixel will be stored as one byte • Number of kilobytes = $(2048 \times 512) / 1024$ <p><i>Answer: One mark:</i></p> <p>Number of kilobytes = 1024 KB</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
3(b)(iv)	<p>One from:</p> <ul style="list-style-type: none"> • Confirmation that the file is a BMP • File size • Location/offset of image data within the file • Dimensions of the image in pixels // image resolution • Colour depth (bits per pixel) • Type of compression used, if any 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>

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)	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25%;">0</td><td style="width: 25%;">0</td><td style="width: 25%;">0</td><td style="width: 25%;">1</td> <td style="width: 25%;">0</td><td style="width: 25%;">0</td><td style="width: 25%;">0</td><td style="width: 25%;">1</td> </tr> <tr> <td>0</td><td>0</td><td>0</td><td>0</td> <td>1</td><td>0</td><td>0</td><td>1</td> </tr> <tr> <td>0</td><td>0</td><td>0</td><td>1</td> <td>0</td><td>1</td><td>1</td><td>0</td> </tr> <tr> <td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>1</td> </tr> </table> <p>Both correct op codes 1 Operand 0001 0001 1 Operand 0110 0001 1</p>	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	1	3
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4(c)	256	1																																
4(d)(i)	07 C2 07 C2	2 1 1																																
4(d)(ii)	LDI 63 LDI 63	2 1 1																																

Question	Answer	Marks																																																																																								
5(a)(i)	<ul style="list-style-type: none"> • 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 	2																																																																																								
5(a)(ii)	A = 1 B = 1	1																																																																																								
5(a)(iii)	<p>Two from:</p> <ul style="list-style-type: none"> • 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 	2																																																																																								
5(b)(i)	<table border="1" style="margin-left: auto; margin-right: auto; text-align: center;"> <thead> <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> </thead> <tbody> <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> <tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td colspan="8"> </td></tr> <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> </tbody> </table>	Bit position								7	6	5	4	3	2	1	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	1	1	1	1	1	0	0	0	1	1	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1									0	1	0	1	1	0	0	0	2
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5(b)(ii)	<p>Three from:</p> <ul style="list-style-type: none"> • 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 	3																																																																																								

Question	Answer	Marks
6(a)	 <p>One mark for each correct line from each left hand box to max <u>three</u> marks.</p>	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)	<p>Two from:</p> <ul style="list-style-type: none"> The user's web browser is the client software 1 The requested web page has program code / script embedded <u>within it</u> 1 This code is interpreted by the web browser 1 	2
7(b)	<p>Four from:</p> <ul style="list-style-type: none"> 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 <u>web server</u> 1 The web server retrieves the page and delivers it to the originator 1 The browser software interprets <u>the script</u> and displays the web page 1 	Max 4
7(c)(i)	<p>Message1, Message2 1</p> <p>x 1</p>	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)	<p>Two checks from: One mark for check and one mark for description</p> <ul style="list-style-type: none"> 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