COMPUTER SCIENCE **9608/13**

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

MARK SCHEME

Maximum Mark: 75

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.
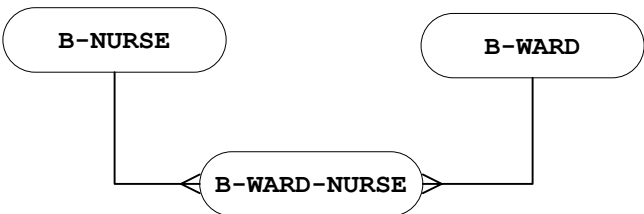
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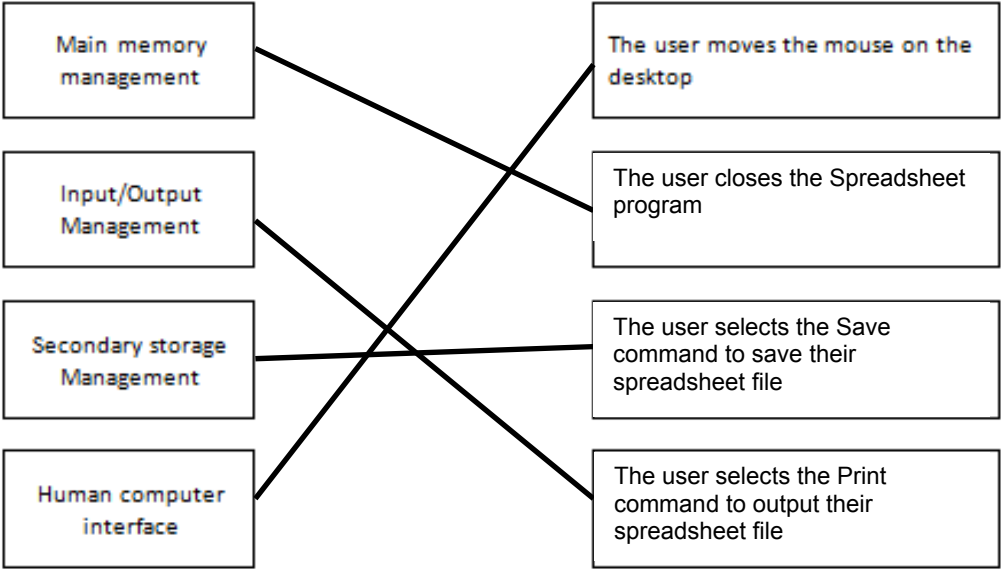
This document consists of **8** printed pages.

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

Question	Answer		Marks
2(a)(i)	<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		**3**
2(a)(ii)	Inkjet printer		**1**
2(b)	Hard disk drive // HDD 1 Solid state drive //SSD // flash memory 1 **One** from: *Hard disk* Inexpensive per unit of storage 1 Lar<u>ger</u> storage capacity than flash drive 1 *Solid state storage* No moving parts / noise 1 Robust 1 Low latency // Fast read/write time 1		**3**

Question	Answer		Marks
3(a)	*Sampling rate* 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> Increasing the sampling rate will increase the accuracy / precision of the digitised sound // Increasing the sampling rate will result in smaller quantisation errors.	1 1	**2**
3(b)(i)	*Pixel* Smallest picture element which can be drawn *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 $\times$ 1080 pixels.	1 1	**2**
3(b)(ii)	8		**1**
3(b)(iii)	*Working*: **Max <u>two</u>** from: • Number of pixels is 2048 $\times$ 512 • One pixel will be stored as one byte • Number of kilobytes = (2048 $\times$ 512) / 1024 *Answer:* **One** mark: Number of kilobytes = 1024 KB	 1 1 1 1	**3**
3(b)(iv)	<u>**One**</u> from: • 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	 1 1 1 1 1 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)	<table><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> <table><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table> <table><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td></tr></table> <table><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table> 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**

Question	Answer	Marks
5(a)(i)	• 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)	<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	**2**
5(b)(i)		**2**
5(b)(ii)	<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	**3**

Question	Answer	Marks
6(a)	Main memory management — The user closes the Spreadsheet program; Input/Output Management — The user selects the Print command to output their spreadsheet file; Secondary storage Management — The user selects the Save command to save their spreadsheet file; Human computer interface — The user moves the mouse on the desktop. 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 • The requested web page has program code / script embedded <u>within it</u> • This code is interpreted by the web browser	1 1 1	**2**
7(b)	**Four** from: • The browser parses the URL to obtain the Domain Name • The browser software passes the Domain Name to the nearest Domain Name Server (DNS) • The DNS stores a list of Domain Names and matching IP addresses • The DNS Name Resolver looks for the Domain Name in its database • If found the corresponding IP address is returned to the originator • If not found the request is forwarded to another higher level DNS • The original DNS adds the returned IP address to its cache • The original DNS returns the IP address to the originator • The browser uses the IP address to request the required web page from the <u>web server</u> • The web server retrieves the page and delivers it to the originator • The browser software interprets <u>the script</u> and displays the web page	1 1 1 1 1 1 1 1 1 1 1	**Max 4**
7(c)(i)	Message1, Message2 x	1 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
	  Check the number entered is (say) between 1 and 100
	
	• Format check
	  Checks the product code is a particular format // Checks the number has digit characters only // by example
	
	• Length check
	  The number of items has exactly five characters
	
	• Existence check
	  To ensure the product code has been assigned
		
		1
		1
		
		1
		
		1
		
		1
		1
		
		1
		1
			Max 4