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Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE

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Paper 1

March 2017

MARK SCHEME

Maximum Mark: 75

Published

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International Examinations

[Turn over

Question	Answer	Marks
1	Any three from: light temperature gas magnetic field pressure moisture humidity pH motion	3

Question	Answer	Marks												
2	1 mark for each correctly drawn line to a maximum of 4. <table><thead><tr><th>Logic Gate Symbol</th><th>Name</th></tr></thead><tbody><tr><td></td><td>AND</td></tr><tr><td></td><td>NOT</td></tr><tr><td></td><td>NOR</td></tr><tr><td></td><td>XOR</td></tr><tr><td></td><td>NAND</td></tr></tbody></table>	Logic Gate Symbol	Name		AND		NOT		NOR		XOR		NAND	4
Logic Gate Symbol	Name													
	AND													
	NOT													
	NOR													
	XOR													
	NAND													

Question	Answer	Marks
3(a)	1 mark for: serial Any two from: serial data transmission more reliable over distance less likely for the data to be skewed/out of synchronisation less interference as only a single wire it is a cheaper connection as only single wire needed // cheaper to set up	3
3(b)	Register 1 – odd Register 2 – even	2
3(c)	Any one from: checksum ARQ (Automatic Repeat request)	1

Question	Answer	Marks																										
4(a)	a v m v e q n d i z m h (2 marks, 1 for each correct word)	2																										
4(b)	<table border="1"><tr><td>v</td><td>w</td><td>x</td><td>y</td><td>z</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>n</td><td>o</td><td>p</td><td>q</td><td>r</td><td>s</td><td>t</td><td>u</td></tr></table> 2 marks shift right all characters shifted five places	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	2
v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u			
4(c)	the first cypher cannot deduce rest of cypher having identified some characters/more random substitution	2																										

Question	Answer	Marks
5	HTML – HyperText Markup Language / language used to create web pages http – hypertext transfer protocol / protocol used by web browsers https – hypertext transfer protocol secure / secure protocol used by web browsers	3

Question	Answer	Marks												
6	1 mark for each correctly drawn line from a function to its description to a maximum of 4 <table><thead><tr><th>Function</th><th>Description</th></tr></thead><tbody><tr><td>Interrupt</td><td>Many processes appear to run simultaneously</td></tr><tr><td>Utility</td><td>Data are temporarily held in a buffer waiting for an output device to access it</td></tr><tr><td>Memory management</td><td>A signal that causes the operating system to take a specified action</td></tr><tr><td>Spooling</td><td>A program that performs a specific task required for the operation of a computer system</td></tr><tr><td>Multitasking</td><td>A process of assigning blocks of memory to programs running in a computer</td></tr></tbody></table>	Function	Description	Interrupt	Many processes appear to run simultaneously	Utility	Data are temporarily held in a buffer waiting for an output device to access it	Memory management	A signal that causes the operating system to take a specified action	Spooling	A program that performs a specific task required for the operation of a computer system	Multitasking	A process of assigning blocks of memory to programs running in a computer	4
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Question	Answer	Marks
7	High definition video – lossy (algorithm) – images may contain less detail without noticeable degradation in quality Text – lossless (algorithm) – so that the original and the decompressed text will be exactly the same	4

Question	Answer	Marks								
8(a)	Denary – 55 Hexadecimal – 37	2								
8(b)	Binary – (00)111001 Denary – 57 Hexadecimal – 39	3								
8(c)	<table><tr><td>0/1</td><td>0/1</td><td>0</td><td>0</td><td>0/1</td><td>1</td><td>1</td><td>1</td></tr></table>	0/1	0/1	0	0	0/1	1	1	1	1
0/1	0/1	0	0	0/1	1	1	1			

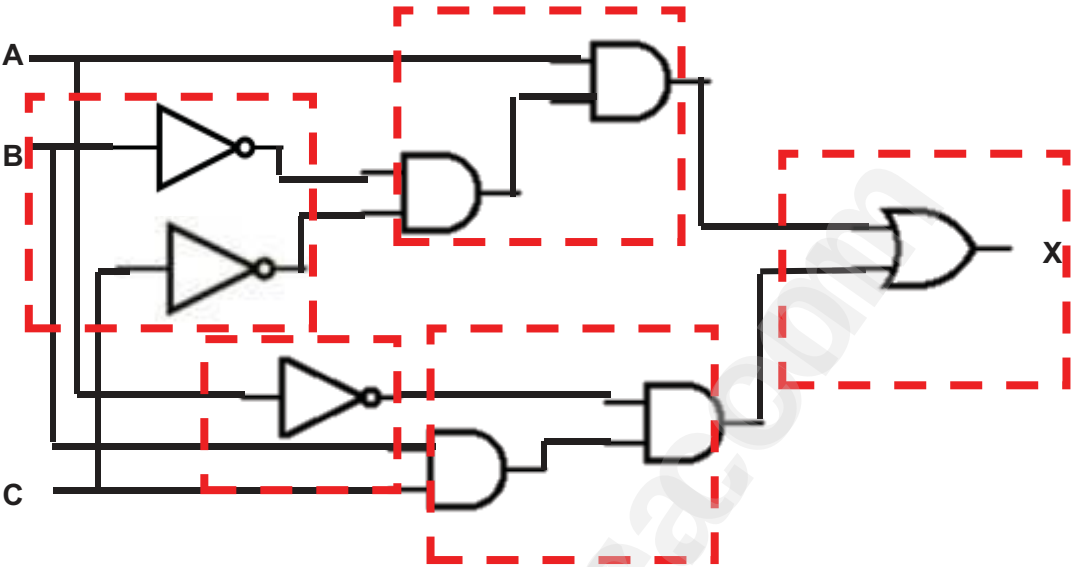
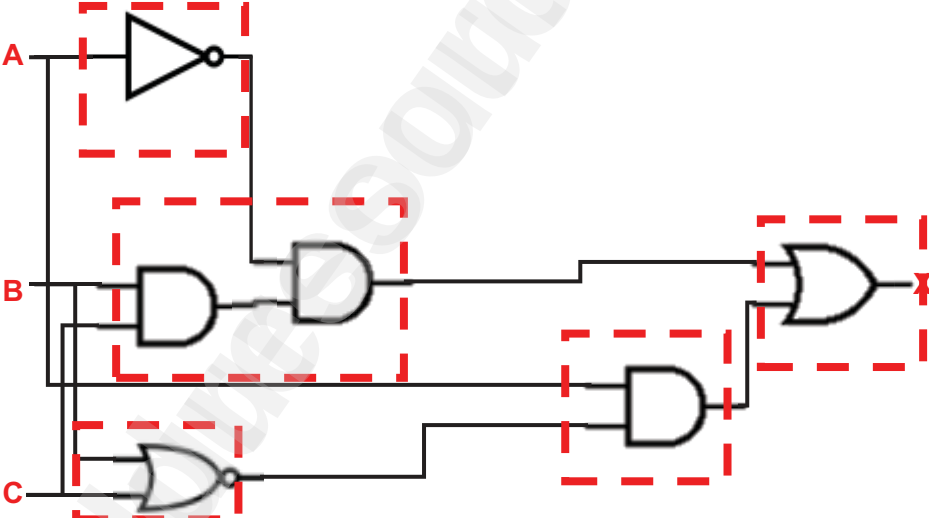
Question	Answer	Marks
9	Any four from, must include at least one difference: Text based password (a minimum number of) characters that can be typed at a keyboard set / can be changed by the user Biometric password a stored physical measurement e.g. fingerprint that is compared to a previously scanned human measurement Difference text based passwords are easier to hack than biometric passwords biometric passwords are unique to that person/cannot be shared	4

Question	Answer	Marks
10	Any three from: barcode 1D and QR code 2D barcodes contain vertical lines and QR codes contain 'squares' QR code can hold more data than a barcode QR code can be read from any angle, some barcode readers have to be lined up with the barcode // QR codes are more error tolerant / faster to scan than barcodes barcodes are frequently used at checkouts / libraries // QR codes are used for advertising // QR codes are frequently used by mobile phones to obtain information	3

Question	Answer	Marks
11	Alice Assembler translates low level language into machine code / only option for low-level language programs Akbar Interpreter easy to identify where an error is / to debug a program Alex Compiler once translated a stand-alone program file is created / no need for the compiler when running the program	6

Question	Answer	Marks
12(a)	1 mark for appropriate use and 1 mark for suitable example for up to three uses e.g. HTML colours e.g. blue 0000FF Display machine code/programs/memory dump e.g. 5F 3A 09 F1 Display (MAC) addresses e.g. 01-23-45-67-89-AB-CD Display ASCII/Unicode values e.g. %41 for A Display error codes e.g. error #404 page not found	6
12(b)	Any two from: easier for programmers to read and understand easier to find errors conversion to binary easier than denary to binary more can be displayed on a screen for addresses etc. // smaller display screens can be used faster than binary for entering numbers	2

Question	Answer	Marks
13(a)	Primary storage – main memory inside a computer /directly accessed by CPU Example – ROM / RAM Secondary storage – non-volatile/persistent memory that is accessed by a device that is part of a computer system / not directly accessed by the CPU Example – HDD / SSD Off-line storage – non-volatile memory that can be removed from a computer system Example – DVD/ Blu-ray / CD / USB flash memory / removable or external HDD or SSD	6
13(b)	125 megabytes CD / <u>low capacity</u> flash memory good for mailing / inexpensive to buy	3

Question	Answer	Marks
14(a)	1 mark for each correct indicated area.  This is one example, many others exist. Alternative example 	5

Question	Answer	Marks																																				
14(b)	4 marks for 8 correct bits 3 marks for 6 correct bits 2 marks for 4 correct bits 1 mark for 2 correct bits <table><tr><th>A</th><th>B</th><th>C</th><th>X</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td></tr></table>	A	B	C	X	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	1	1	0	0	1	1	0	1	0	1	1	0	0	1	1	1	0	4
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