

COMPUTER SCIENCE

9608/11 May/June 2018

Paper 1 Written Paper MARK SCHEME Maximum Mark: 75

Published

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks
1	1 mark for a correct line from each communication media, max 6	6
	Fibre-optic Can be twisted pair or co-axial	
	Transmits light pulses	
	Radio	
	waves Large range of wavelengths	
	Copper cable	
	Wireless transmission	
	Satellite	

Question	Answer	Marks				
2(a)	 1 mark per bullet, max 2 Made up of pixels Each pixel has one colour Colour of each pixel stored as a binary number 					
2(b)(i)	 1 mark per bullet, max 2 Each pixel requires only one bit (as there are only two colours) Black represented by 1 and white by 0 (or vice versa) Bits are stored for each pixel in sequence 11111 01010 01010 01010 01010 	2				
2(b)(ii)	 mark for the explanation Stores the colour and the number of times it occurs 1 mark for example from An example from the bitmap given e.g. B5, W1, B1 and so on 	2				
2(c)	1 mark per bullet • Number of pixels 500*1000 (= 500 000) • 35 colours require 6 bits per pixel • Number of bytes (500 000 * 6) / 8 = 3 000 000 / 8 (= 375 000) • = 375 Kb	4				

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Question	Answer	Marks
2(d)	 mark per bullet to max 2 marks per benefit Can resize it without pixilation Image is redrawn/recalculated with each adjustment Smaller file size Storing points/equations/commands etc., not individual pixels 	4

Question	Answe	er		Marks			
3(a)(i)	 1 mark per bullet to max 3 Allocates / deallocates RAM to programs/tasks/processes Keeps track of allocated and free memory locations Swaps data to and from the hard drive Handles virtual memory Paging // segmentation Memory protection, preventing a process accessing memory not allocated to it 						
3(a)(ii)	 1 mark per bullet to max 3 Sets up user accounts Checks usernames, passwords // Authentication Implements access rights <u>Automatic</u> backup System restore / roll back (to previous stable state) 						
3(a)(iii)	 1 mark per bullet to max 2 Device / peripheral management File management Process management Input / output management Error detection / recovery Provides a user interface Facilitates communication between hardware and software / hardware devices 						
3(b)	1 mark for each correct box ticked						
	Programs	True	False				
	Disk Defragmenter ✓						
	Word Processor 🗸						
	Library program						
	Compression Software	\checkmark					

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Question					Answer			Marks
4(a)	1 mai • •	C OI	ullet: R B R D OR I I AND	E				3
	А- в-			>)—	- x	
	D- E -							
4(b)	1 ma	rk for ea	ach corre	ect pair c	f rows			4
		Α	В	С	Working space	x		
		0	0	0		0		
		0	0	1		1		
		0	1	0		1		
		0	1	1		0		
		1	0	0		1		
		1	0	1		1		
		1	1	0		1		
		1	1	1		1		

Question	Answer	Marks
5(a)	1 mark per server e.g. • E-mail • Print • Web	2
5(b)	1 mark for the indicating the statement is false:	5
	True False	
	\checkmark	
	 1 mark per bullet for justification to max 4. Internet is the infrastructure / global collection of networks World Wide Web is the (multimedia web) pages / content The World Wide Web is accessed over the Internet Webpages are written in HTML HTTP protocol used to transfer web pages Internet uses IP protocol 	
5(c)	 1 mark per bullet to max 4 The <u>browser</u> requests the web page The web server accesses the page The web server processes / executes the code The web server produces the HTML for the web page / generates the web page The web server returns the web page to the client The client browser displays this web page 	4

Question		Answer									
6(a)	1 mark for the	mark for the correct parity									
	Parit <u>y bit</u>	Parity bit									
	0	0	1	0	0	0	0	0			
		0	1	0	0	0	0	0			

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Question	Answer								Marks	
6(b)(i)	1 mark f	or the co	orrect bit	circled						1
		Parity bit				Data				
		1	1	0	1	0	1	1	1	
		1	0	0	0	1	1	1	0	
		0	1	0	0	1	0	1	1	
		1	1	1	0	1		1	1	
	Parity byte	1	1	1	1	1	0	0	1	
6(b)(ii)	•	rk for each bullet point row and column has incorrect parity (odd instead of even) the intersection identifies the error						2		
6(c)			an ever s error b	n numbe eing ider	ntified	(in the sa	ame row (or colum	าท)	2
6(d)		For the nation of the results of the	ation is c ation is c ult is tran ion repe compare nt an err tal several f g fields n ult is tran ion repe compare	lone on a smitted ated at re ed or has o fields of e not usual asmitted ated at re	a block c with the eceiving ccurred data ly used i with the eceiving	of data data end n calcula data				3

Question	Answer	Marks
7(a)	 1 mark for each input device to max 2 e.g. (Handheld) remote controller Joystick / Games pad / joypad Accelerometer Microphone Suitable sensor 	3
	 1 mark for output e.g. Motor/vibrator in joystick Speaker Screen/monitor /TV 	
7(b)(i)	 1 mark for each difference to max 2 RAM is volatile and ROM is non-volatile RAM can change and ROM (usually) can't be changed ROM is read only, RAM is read/write 	2
7(b)(ii)	 1 mark for example e.g. Current game Currently running processes Current graphics/sound 	1
7(b)(iii)	 1 mark for an example e.g. Start-up instructions / boot program Kernel of Operating System 	1

Question	Answer	Marks
8(a)	 1 mark per bullet to max 2 Small piece / word of (fast) memory Part of the processor Temporary storage of data Data is about to be / has been processed 	2
8(b)(i)	 1 mark per bullet to max 2 Stores / holds data / instruction when fetched from memory Stores / holds data which is being written to memory The location accessed is the address held in the Memory Address Register (MAR) 	2

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Question	Answer	Marks
8(b)(ii)	 1 mark per bullet to max 2 Current Instruction Register (CIR) Memory Address Register (MAR) Program Counter (PC) Accumulator (ACC) Index Register (IX) Status Register Interrupt Register 	2
8(c)(i)	135	1
8(c)(ii)	87	1
8(c)(iii)	-121	1