Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

COMPUTER SCIENCE	**9608/13**
Paper 1 Written Paper	**May/June 2018**
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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This document consists of **9** printed pages.

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.

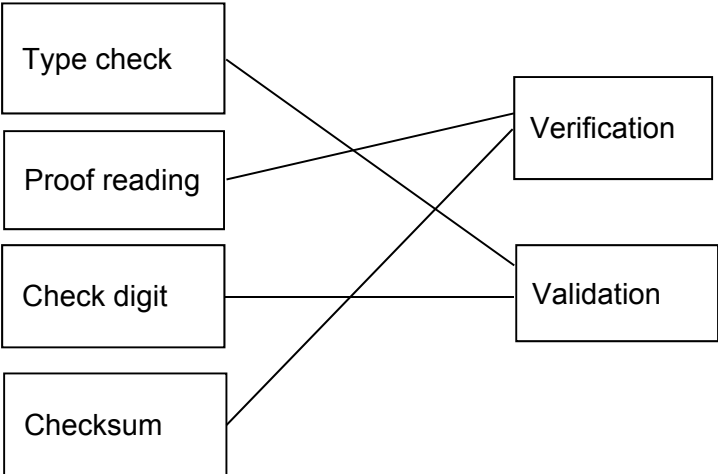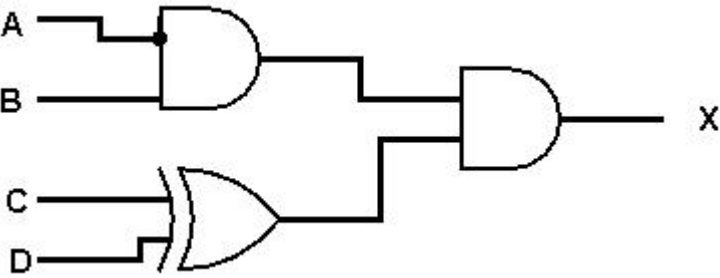| |
|---|
| GENERIC MARKING PRINCIPLE 1:

 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. |

Question	Answer	Marks

1(a)	**1 mark** for each variable name
	
	`$gradeChar`
	`$inputMark`
		2

1(b)	03	**1**
1(c)	Gets the value stored in the text box / input field "`mark`"... To be used as a <u>parameter</u> in `calculateGrade`	**2**
1(d)	Server-side	**1**

Question	Answer	Marks
2(a)	**1 mark** for each correct relationship 	**2**

2(b)	**1 mark** for description
	     Ensure data is consistent / accurate // keep data consistent / accurate
	
	1 mark for example from:
	
	e.g.
	     Validation rules
	     Referential integrity
	     Verification
	     Input masks
	     Setting data types
	     Removing redundant data
	     Backup data
	     Access controls
	     Audit trail
		2

2(c)	**1 mark** for the correct box ticked
	
	<table><tr><th>True</th><th>False</th></tr><tr><td>✓</td><td></td></tr></table>
	1 mark per bullet for justification, **max 2**
	
	     No repeated attributes // data is atomic // No partial dependencies (no dual keys)
	     No non-key / transitive dependencies
		3

Question	Answer	Marks

2(d)(i)	**1 mark** per bullet
	
	      `CREATE TABLE PLAYER` and `();`
	      `PlayerID` and `PlayerName` as `VARCHAR` and commas
	      `SkillLevel` as `INT` and comma
	      `PRIMARY KEY(PlayerID)`
	      An appropriate `NOT NULL`
	
	`CREATE TABLE PLAYER(`
	    `PlayerID: varchar NOT NULL,`
	    `PlayerName: varchar,`
	    `SkillLevel: int,`
	    `PRIMARY KEY(PlayerID),`
	    `);`
		5

2(d)(ii)	**1 mark** per bullet
	
	      `ALTER TABLE PLAYER`
	      `ADD DateOfBirth Date;`
		2

Question	Answer	Marks
3(a)	**1 mark** per bullet to **max 2** for each group **ALU** performs arithmetic operations And logical operations / comparisons **Control Unit** sends / receives signals Synchronises operations to control operations // execution of instructions Accept by example e.g. Input output // flow of data	**4**
3(b)	**1 mark** per bullet to **max 2** for each group **Status Register** is interpreted as independent bits / flags Each flag is set depending on an event An example: addition overflow / result of operation is zero etc. **Program Counter** stores the <u>address</u> of the <u>next</u> instruction to be fetched	**4**
3(c)(i)	193	**1**
3(c)(ii)	C1	**1**
3(c)(iii)	− 63	**1**
3(c)(iv)	The <u>first 4 bits / first nibble</u> (would give 12 which) is <u>> 9 / 2 digits</u> (which is not valid for BCD)	**1**

Question	Answer	Marks
4(a)	**Parity bit** | **1**	0	1	1	1	0	1	0
---	---	---	---	---	---	---	---		**1**
4(b)	**1 mark** for correctly circled bit	**1**

	Parity bit	Data						
	0	0	1	1	0	1	0	1
	1	1	1	1	1	0	0	1
	1	0	1	0	1	0	(0)	0
	0	0	0	1	1	0	1	1
Parity byte	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**1**

Question	Answer	Marks
4(c)	**1 mark** for each correct line **Error detection measure** Type check — Validation Proof reading — Verification Check digit — Validation Checksum — Verification	**4**

Question	Answer	Marks
5(a)	**1 mark** per correct gate with correct inputs 	**3**
5(b)	**1 mark** for each correct pair of lines	**4**

A	B	C	Working space	X
0	0	0		0
0	0	1		0
0	1	0		1
0	1	1		0
1	0	0		1
1	0	1		0
1	1	0		0
1	1	1		0

Question	Answer	Marks
6(a)	1	**1**
6(b)	**1 mark** for correct method (colour code and number of pixels) **1 mark** for first 7 groups correct **1 mark** for remainder correct 3B9 1A3 3B3 1A2 3B1 1A2 3B2 1A1 3B3 1A1 3B2 1A2 3B1 1A2 3B3 1A3 3B9	**3**
6(c)	5	**1**

Question	Answer	Marks
6(d)	**1 mark** for purpose 　　　Stores data about the file contents/image/metadata **Max 2 marks** for examples of contents 　　　<u>Confirmation</u> that the file is a BMP // confirmation of file type 　　　File size 　　　Location / offset of image data within the file 　　　Dimensions of the image (in pixels) // <u>image</u> resolution 　　　Colour depth (bits per pixel, 1, 4, 8, 16, 24 or 32) 　　　Type of compression used (if any)	3
6(e)	**1 mark** for naming tool, **1 mark** for describing effect **on the photograph** e.g. 　　　Resize 　　　Increase / decrease the size of the image 　　　Crop 　　　Remove part of the image 　　　Blur 　　　Reduce the focus 　　　Red eye reduction 　　　Reduces red (light reflected from human eyes)	6

Question	Answer	Marks
7(a)	**1 mark** per bullet to **max 4** 　　　**Resistive** (screen) consists of two <u>charged</u> plates 　　　Pressure causes the plates to touch 　　　Completing the circuit 　　　Point of contact registered 　　　Coordinates used to calculate the position 　　　**Capacitive** (screen) made from materials that store electric charge 　　　When touched charge transferred to the finger 　　　Sensors at the (screen) corners detect the change 　　　Point of contact registered 　　　Coordinates used to calculate the position	4
7(b)(i)	**1 mark** for suitable device e.g. 　　　Speaker 　　　Headphones	1

Question	Answer	Marks

7(b)(ii)	**1 mark** for naming input device **1 mark** for use in this scenario, for **max 2 devices** e.g.
	
	    Microphone
	    ...visitor says commands / search criteria for the computer to respond to
	
	    Keyboard
	    ...visitor types key words to look for
	
	    Mouse
	    ...visitor controls cursor to navigate / select
	
	    Trackpad
	    ...visitor uses finger to control cursor to navigate / select
		4

7(c)	**1 mark** for device
	(Internal) hard <u>drive</u> / solid state <u>drive</u>
	
	1 mark per bullet. **Max 2 marks** for each reason, **max two** reasons
	e.g.
	
	Hard drive
	    Large capacity...
	    to store videos / images / sound files with large file sizes
	
	    Reasonably fast access speed...
	    Users will not have to wait for videos to load
	
	    Inexpensive per unit storage...
	    If a large number of needed for different exhibits, the cost can be kept low
	
	    Does not need to be moved …
	    So moving parts unlikely to be damaged
	
	    Slower degradation of data …
	    So will last longer / be more reliable under heavy use
	
	Solid state
	    Large capacity…
	    To store videos/images/sound files with large file sizes
	
	    Fast access speed...
	    Users will not have to wait for videos to load
	
	    Reliable...
	    Can be dropped/damaged and will likely still work / no moving parts
	
	    Quiet...
	    No moving parts
		5

Question	Answer	Marks

7(d)	**1 mark** for a correct reason for RAM, **1 mark** for a correct reason for ROM
	
	RAM
	     Currently running data / video / music / images / software
	
	ROM
	     Boot up instructions / OS kernel
		2