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Cambridge International AS & A Level

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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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(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 **True** ✓ / **False** (blank) **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**

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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 address • of the next instruction to be fetched	**4**
3(c)(i)	193	**1**
3(c)(ii)	C1	**1**
3(c)(iii)	− 63	**1**
3(c)(iv)	The first 4 bits / first nibble (would give 12 which) is > 9 / 2 digits (which is not valid for BCD)	**1**

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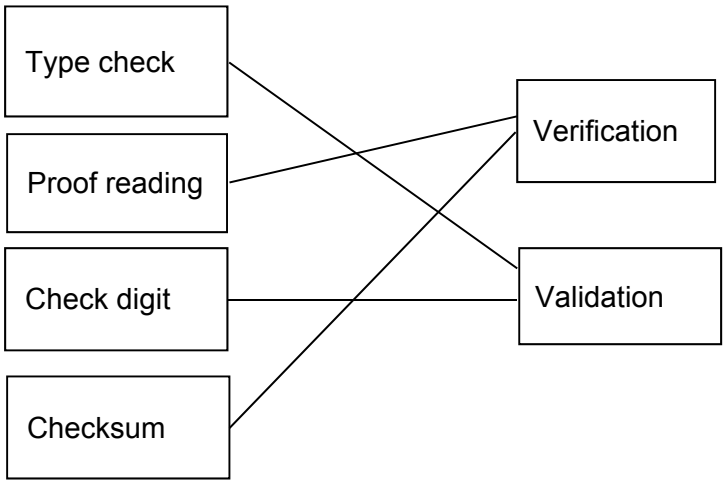
<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4(a)</td><td>Parity bit
<table><tr><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></table></td><td>1</td></tr>
<tr><td>4(b)</td><td>1 mark for correctly circled bit
<table><tr><td></td><td>Parity bit</td><td colspan="7">Data</td></tr><tr><td></td><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></td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td></td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td></td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td></tr><tr><td>Parity byte</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td></tr></table></td><td>1</td></tr>
<tr><td>4(c)</td><td>1 mark for each correct line

Error detection measure

</td><td>4</td></tr>
</table>

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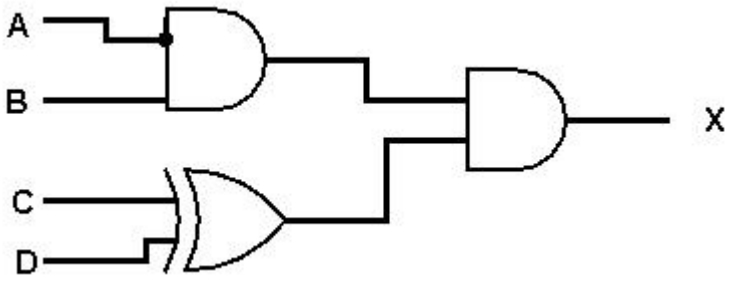
<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)</td><td>1 mark per correct gate with correct inputs

</td><td>3</td></tr>
<tr><td>5(b)</td><td>1 mark for each correct pair of lines
<table>
<tr><th>A</th><th>B</th><th>C</th><th>Working space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td></td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td></td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td></td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td></td><td>0</td></tr>
</table></td><td>4</td></tr>
</table>

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**

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Question	Answer	Marks
6(d)	**1 mark** for purpose • Stores data about the file contents/image/metadata **Max 2 marks** for examples of contents • Confirmation 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) // image 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 charged 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**

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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 drive / solid state drive **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**

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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**

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