
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.

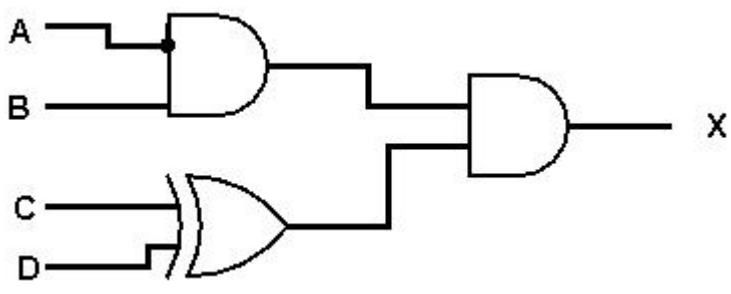
Question	Answer	Marks
1(a)	1 mark for each variable name \$gradeChar \$inputMark	2
1(b)	03	1
1(c)	<ul style="list-style-type: none"> Gets the value stored in the text box / input field “mark”... To be used as a <u>parameter</u> in calculateGrade 	2
1(d)	Server-side	1

Question	Answer	Marks				
2(a)	1 mark for each correct relationship  <pre> classDiagram class LOGIN class PLAYER class PURCHASE LOGIN --> PLAYER PLAYER --> PURCHASE </pre>	2				
2(b)	1 mark for description <ul style="list-style-type: none"> Ensure data is consistent / accurate // keep data consistent / accurate 1 mark for example from: e.g. <ul style="list-style-type: none"> 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 border="1" data-bbox="616 1603 995 1704"> <tr> <td>True</td> <td>False</td> </tr> <tr> <td style="text-align: center;">✓</td> <td></td> </tr> </table> 1 mark per bullet for justification, max 2 <ul style="list-style-type: none"> No repeated attributes // data is atomic // No partial dependencies (no dual keys) No non-key / transitive dependencies 	True	False	✓		3
True	False					
✓						

Question	Answer	Marks
2(d)(i)	<p>1 mark per bullet</p> <ul style="list-style-type: none"> • CREATE TABLE PLAYER and (); • PlayerID and PlayerName as VARCHAR and commas • SkillLevel as INT and comma • PRIMARY KEY(PlayerID) • An appropriate NOT NULL <pre>CREATE TABLE PLAYER(PlayerID: varchar NOT NULL, PlayerName: varchar, SkillLevel: int, PRIMARY KEY(PlayerID),);</pre>	5
2(d)(ii)	<p>1 mark per bullet</p> <ul style="list-style-type: none"> • ALTER TABLE PLAYER • ADD DateOfBirth Date; 	2

Question	Answer	Marks
3(a)	<p>1 mark per bullet to max 2 for each group</p> <ul style="list-style-type: none"> • 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)	<p>1 mark per bullet to max 2 for each group</p> <ul style="list-style-type: none"> • 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)	<p>Parity bit</p> <table border="1" style="margin-left: 20px;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> </table>	1	0	1	1	1	0	1	0	1																																														
1	0	1	1	1	0	1	0																																																	
4(b)	<p>1 mark for correctly circled bit</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="text-align: center;">Parity bit</th> <th colspan="8" style="text-align: center;">Data</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">Parity byte</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> </tr> </tbody> </table>	Parity bit	Data								0	0	1	1	0	1	0	1	1	1	1	1	1	1	0	0	1	1	1	0	1	0	1	0	0	0	1	0	0	0	1	1	0	1	1	1	Parity byte	0	1	1	1	1	1	0	1	1
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Parity byte	0	1	1	1	1	1	0	1																																																
4(c)	<p>1 mark for each correct line</p> <p>Error detection measure</p> <div style="margin-left: 20px;"> <table border="0"> <tr> <td style="border: 1px solid black; padding: 5px; width: 150px;">Type check</td> <td style="border: 1px solid black; padding: 5px; width: 150px;">Verification</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">Proof reading</td> <td style="border: 1px solid black; padding: 5px;">Validation</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">Check digit</td> <td style="border: 1px solid black; padding: 5px;">Validation</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">Checksum</td> <td style="border: 1px solid black; padding: 5px;">Verification</td> </tr> </table> </div>	Type check	Verification	Proof reading	Validation	Check digit	Validation	Checksum	Verification	4																																														
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Question	Answer	Marks																																													
5(a)	<p>1 mark per correct gate with correct inputs</p> 	3																																													
5(b)	<p>1 mark for each correct pair of lines</p> <table border="1" data-bbox="327 728 1212 1400"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> <th>Working space</th> <th>X</th> </tr> </thead> <tbody> <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> </tbody> </table>	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	4
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Question	Answer	Marks
6(a)	1	1
6(b)	<p>1 mark for correct method (colour code and number of pixels) 1 mark for first 7 groups correct 1 mark for remainder correct</p> <ul style="list-style-type: none"> • 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)	<p>1 mark for purpose</p> <ul style="list-style-type: none"> Stores data about the file contents/image/metadata <p>Max 2 marks for examples of contents</p> <ul style="list-style-type: none"> <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)	<p>1 mark for naming tool, 1 mark for describing effect on the photograph</p> <p>e.g.</p> <ul style="list-style-type: none"> 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)	<p>1 mark per bullet to max 4</p> <ul style="list-style-type: none"> 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)	<p>1 mark for suitable device</p> <p>e.g.</p> <ul style="list-style-type: none"> Speaker Headphones 	1

Question	Answer	Marks
7(b)(ii)	<p>1 mark for naming input device 1 mark for use in this scenario, for max 2 devices</p> <p>e.g.</p> <ul style="list-style-type: none"> • 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)	<p>1 mark for device (Internal) hard <u>drive</u> / solid state <u>drive</u></p> <p>1 mark per bullet. Max 2 marks for each reason, max two reasons</p> <p>e.g.</p> <p>Hard drive</p> <ul style="list-style-type: none"> • 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 <p>Solid state</p> <ul style="list-style-type: none"> • 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)	<p>1 mark for a correct reason for RAM, 1 mark for a correct reason for ROM</p> <p>RAM</p> <ul style="list-style-type: none">• Currently running data / video / music / images / software <p>ROM</p> <ul style="list-style-type: none">• Boot up instructions / OS kernel	2