Cambridge Assessment International Education

Cambridge International AS & A Level

COMPUTER SCIENCE **9608/13**

Paper 1 Written Paper **May/June 2020**

MARK SCHEME

Maximum Mark: 75

Published

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

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

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

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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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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1(a)</td><td>1 mark for each correctly completed media or description

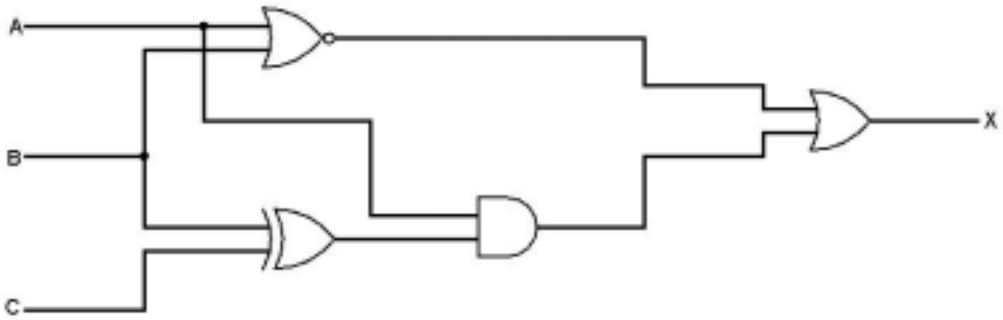
<table>
<tr><th>Type of connection</th><th>Description</th></tr>
<tr><td>Fibre-optic</td><td>Transmits data as light //
Uses (a bundle of) glass/plastic threads to transmit data</td></tr>
<tr><td>Satellite</td><td>A communication device in Earth’s orbit that receives and transmits data</td></tr>
<tr><td>Radio Waves</td><td>Carries data wirelessly, often known as Wi-Fi //
Carries data in the form of electromagnetic waves</td></tr>
<tr><td>Copper cable</td><td>Carries data as electrical signals and can consist of a twisted pair</td></tr>
</table></td><td>4</td></tr>
<tr><td>1(b)</td><td>1 mark per bullet point to max 2

• The employees’ computers are the clients
• The server hosts the (shared) files
• An employee can request a file (from the server) from any of the client computers
• Several employees can access the same file (on the server) at the same time</td><td>2</td></tr>
<tr><td>1(c)</td><td>1 mark per bullet point

• Improved security because the IP address is not visible outside the network
• An internet presence is not required for each employee computer
• Only the router needs a public IP address, as only the router needs to be externally visible
• Reduces number of (public) IP addresses needed</td><td>2</td></tr>
</table>

Question	Answer	Marks
2(a)	**1 mark** for each appropriate term The printer uses a **laser (beam)** and a rotating **mirror** to draw the contents of the page on the photosensitive drum as **an electrostatic** charge. The **toner** is attracted to this charge.	**4**

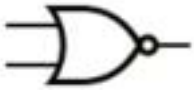
Question	Answer	Marks
2(b)	**1 mark** per bullet point. **Max 2** for RAM, **max 2** for ROM RAM • Stores currently running parts of the printer software • Stores the data being printed // contents of buffer • Stores current progress of printing • Stores the data about the printer, e.g. toner levels ROM • Stores the printer operating software // OS for the printer • Stores the boot-up/start-up instructions for the printer • Printer fonts stored in ROM	**4**
2(c)(i)	**1 mark** • To provide the connection to peripheral devices • To provide an interface between the computer and other devices	**1**
2(c)(ii)	**1 mark** • USB • HDMI • SCSI • Firewire • Ethernet • Any other acceptable port	**1**

Question	Answer	Marks
3(a)	**1 mark** per correct gate • A NOR B • B XOR C • A AND (B XOR C) • Final OR  	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3(b)</td><td>1 mark for each correct pair of answers (4 shaded sections)

<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>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>0</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>0</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td></td><td>0</td></tr>
</table></td><td>4</td></tr>
<tr><td>3(c)</td><td>1 mark for name, 1 mark for symbol matching the name

NAND 

NOR </td><td>2</td></tr>
</table>

Question	Answer	Marks
4(a)(i)	**1 mark** per reason to **max 3** • DDL file is only loaded into memory when required • ... so the executable file for the game is smaller • Changes/improvements in the DLL file are independent of the main program • ... the game program will not need to be recompiled • ... the game program will get the benefit of the updates automatically • The same DDL file can be used in several game programs (at the same time) • (DLL) routines are pre-written saving the developers time • (DLL) routines are pre-tested so should be reliable • Developers can take advantage of other programmers' expertise	**3**
4(a)(ii)	**1 mark** per reason to **max 2** • Game will not work if DDL is corrupted • An external change to the DDL could stop the game working or change the way it works • The DDL file must be present at run-time otherwise there is an error	**2**

Question	Answer	Marks
4(b)	**1 mark** for interpreter **1 mark** per bullet point for justification to **max 2** • The interpreter translates and executes line by line • The interpreter stops translation when an error is found • …the error can be corrected, and the program continues running from where it stopped • There is no need for an executable file (at this stage)	**3**
4(c)(i)	**1 mark** per benefit to **max 2** • She can charge a fee for the game • She retains the copyright • ... so, the game cannot be re-distributed by a third-party without her permission	**2**
4(c)(ii)	**1 mark** per benefit to **max 1** • Potentially better support, as she is charging a fee • Likely to have fewer bugs / less prone to malware than if distributed under other licences e.g. open source • Redress available if the game does not function correctly	**1**
4(c)(iii)	**1 mark** per bullet point • They can check it works // check if it meets their requirements • ... without having to paying a fee if it does not	**2**

Question	Answer	Marks
5(a)	**1 mark** per bullet point to **max 3** • Encryption scrambles the source code (so it is meaningless) • … using an encryption key / algorithm • If the file is accessed without authorisation it will be meaningless • It requires a decryption key / algorithm to unscramble	**3**
5(b)	**1 mark** for a lossless technique **1 mark** per bullet point for justification to **max 2** • Lossless does not lose any data • Any lost data will mean the program will not work	**3**

Question	Answer	Marks
6(a)	**1 mark** for each correct line **Database Term** / **Description** Primary key → A unique identifier for each tuple Attribute → A data item, represented as a field within a table Foreign key → A field in one table that links to a primary key in another table Entity → The concept or object in the system that we want to model and store information about A collection of records and tables The type of data that is being stored	**4**
6(b)	**1 mark** per task to **max 3** • Create a table • Set up relationships between tables • Create / design a form • Create / design a report • Create / design a query (NOT run a query)	**3**

6(c)(i)	**1 mark** for each completed line
	
	`CREATE TABLE ROOM(`
	`  RoomNumber Integer,`
	`  RoomType Varchar,`
	`  PRIMARY KEY (RoomNumber)`
	`);`
		3

6(c)(ii)	**1 mark** for each completed line
	
	`INSERT INTO ROOM`
	`VALUES (5,"Double");`
		2

Question	Answer	Marks

6(c)(iii)	**1 mark** per bullet point
	
	• Alter table booking
	• Add number of nights with appropriate field name and data type
	
	`ALTER TABLE BOOKING`
	`ADD NumberNights Integer;`
		2

Question	Answer	Marks
7(a)	**1 mark** for each feature and **1 mark** for further related expansion to **max 2** • Colour select • Select all pixels of the same colour • Add text • To show the name of the company • Resize the star shape • To fit the space available in the box • Fill an area with colour • To shade the side of the box • Select • 'Grab' a number of pixels to perform a task with/to • Copy • Replicate a number of pixels	**2**
7(b)	**1 mark** per bullet point • 160 * 160 (= 25600 pixels) • 25600 * 3 (= 76800 bytes) • 75 KB (divide by 1024) or 76.8 KB (divide by 1000)	**3**
7(c)	**1 mark** per bullet point to **max 2** • The logo can be enlarged without becoming pixelated • because the instructions to create the logo are stored **or** • (Usually) smaller file size • only coordinates and calculations stored instead of individual pixels	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>7(d)</td><td>1 mark for 1 or 2 correct answers
2 marks for 3 correct answers

<table>
<tr><th></th><th>Red</th><th>Green</th><th>Blue</th></tr>
<tr><td>Hexadecimal value</td><td>91</td><td>3C</td><td>8E</td></tr>
<tr><td>Denary value</td><td>145</td><td>60</td><td>142</td></tr>
</table>
</td><td>2</td></tr>
<tr><td>7(e)(i)</td><td>1 mark

Displays a message box containing the text ‘Error’</td><td>1</td></tr>
<tr><td>7(e)(ii)</td><td>1 mark per bullet point

• Assigns to the variable <code>Value</code>
• the contents of the object <code>"FirstBox"</code></td><td>2</td></tr>
<tr><td>7(e)(iii)</td><td>1 mark per bullet point

• Writes the text <code>"Agreed"</code>
• To the object with Id <code>paragraph1</code></td><td>2</td></tr>
</table>

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