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Cambridge Assessment International Education

Cambridge International AS & A Level

COMPUTER SCIENCE **9608/12**

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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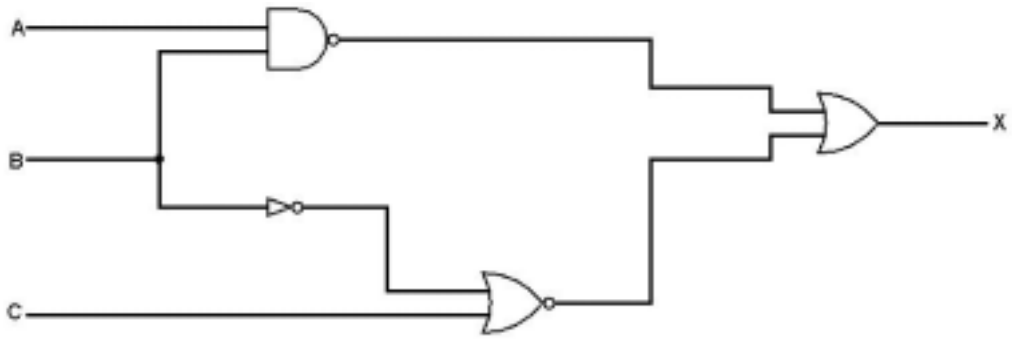
Question	Answer	Marks
1(a)	**1 mark** for each correct term The resistive touchscreen has two layers with **a gap / an air gap** between the layers. When a finger touches the screen, the **top layer** moves to touch the **bottom layer**; this creates a point of contact. The **horizontal** and **vertical** position of this point is calculated.	**4**
1(b)(i)	**1 mark** per bullet point to **max 3** • It is a series of (geometric) shapes / lines / objects • Stored coordinates • Contains a drawing list • Commands / formulae for creating each individual object • and the attributes/property for that object • E.g. the colour, thickness of line etc.	**3**
1(b)(ii)	**1 mark** per bullet point to **max 2** • Needs to be large for the signs without becoming pixelated. • Smaller file size means faster transfer rates are possible. • Smaller file size reduces storage requirements when stored many times (on multiple documents).	**2**

Question	Answer	Marks
2(a)	**1 mark** for each correct term/definition **Term** / **Definition** Sampling / **The amplitude of the analogue sound wave is recorded at regular/set intervals** **Sampling rate** / The number of samples per unit time Sampling resolution / **The number of bits used to store each sample**	**3**
2(b)(i)	**1 mark** only from: • Run-length encoding • Huffman Coding • Any other valid encoding method	**1**
2(b)(ii)	**1 mark** per bullet point to **max 2** • Reduce sampling rate • ... fewer samples taken per second means less data is being stored Or • Reduce sample resolution • ... fewer bits are used to represent each sample, so less data is stored	**2**

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Question	Answer	Marks
2(c)(i)	**1 mark** per bullet point to **max 3** • Disk contents analysis checks for errors/problems with the disk • Disk repair attempts to fix the errors • The disk formatter prepares the disk for (initial) use (again).	**3**
2(c)(ii)	**1 mark** per bullet point to **max 3** • Installation of device driver software • Managing interrupts / signals from the device • Sending control signals to the device • Control of buffers • Management of queues	**3**
2(c)(iii)	**1 mark** for benefit, **1 mark** for expansion for **max 2** benefits • Fast data transfer • … useful when transferring large files such as video files • Automatic connection / plug-and-play • … so usually there is no need to install separate device drivers • USB is a standard adopted by many manufacturers • … meaning all new computers will be equipped with USB ports • Devices may be powered or charged through USB • … so external devices may be charged while working at the computer	**4**

Question	Answer	Marks
3	**1 mark** for each correct gate X = NOT (A AND B) OR NOT (NOT B OR C)  	**4**
4(a)(i)	**1 mark** only e.g. • Read about the languages she will be using • Visits the office prior to starting • Speaks to her manager about concerns	**1**

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Question	Answer	Marks
4(a)(ii)	**1 mark** per action to **max 2** For example: • Prepare an induction • Invite Sophie in before starting • Introduce Sophie to the team • Give Sophie a mentor	**2**
4(a)(iii)	**1 mark** only e.g. • Prepare a greeting/introduction • Provide structured support • Invite Sophie to social event(s) before/at the start to meet people	**1**
4(b)	**1 mark** per bullet point to **max 3** • Sophie is confirming that she understands the code of conduct • To make sure Sophie knows what behaviour is expected of her • To make sure Sophie understands there may be consequences of some actions • To ensure all employees adhere to the same standards	**3**

Question	Answer	Marks
5(a)	**1 mark** for **one** letter in the correct place, **2 marks** for all **three** correct 2 B 4 A 5 C	**2**
5(b)(i)	11000010	**1**
5(b)(ii)	CD	**1**
5(b)(iii)	**1 mark** per bullet point to **max 2** • The maximum range for an 8-bit two's complement binary number is −128 to +127 • … 200 is outside of the maximum range	**2**

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Question	Answer	Marks
5(c)	**1 mark** for each highlighted section block	**6**

Instruction address	ACC	Memory address			
		100	101	102	103
		1	2	3	0
20	0				
21					
22					
23	**1**				
24	**3**				
25		**3**			
26	**0**				
27	**1**				
28					**1**
29					
20	**1**				
21					
22					
23	**3**				
24	**5**				
25		**5**			
26	**1**				
27	**2**				
28					**2**
29					
20	**2**				
21					
22					
30					

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)</td><td>1 mark per bullet point to max 2

• There are partial dependencies in the SOFTWARE_PURCHASED table // SoftwareDescription is dependent only on SoftwareName and not both SoftwareName and CustomerID

• There is a non-key dependency in the SOFTWARE_PURCHASED table // LicenceCost is dependent on LicenceType</td><td>2</td></tr>
<tr><td>6(b)</td><td>1 mark for a suitable example for each

<table><tr><th>Term</th><th>Example</th></tr><tr><td>Entity</td><td>SOFTWARE_PURCHASED //CUSTOMER_DETAILS</td></tr><tr><td>Foreign Key</td><td>CustomerID
(in SOFTWARE_PURCHASED table)</td></tr><tr><td>Attribute</td><td>Any valid example of an attribute from the tables</td></tr></table></td><td>3</td></tr>
<tr><td>6(c)(i)</td><td>1 mark for each correct entry (in bold)

CREATE TABLE GAME_DEVELOPMENT (
GameName VarChar,
Genre VarChar,
TeamNumber Integer,
DevelopmentStage VarChar,
ManagerID VarChar,
PRIMARY KEY (GameName)
);</td><td>5</td></tr>
<tr><td>6(c)(ii)</td><td>1 mark for each correct entry (shown in brackets)

SELECT (1) GameName, Genre, TeamNumber
FROM GAME_DEVELOPMENT, PRODUCT_MANAGER
WHERE PRODUCT_MANAGER.FirstName = "James"
AND PRODUCT_MANAGER.SecondName = "Fitz"
AND PRODUCT_MANAGER.ManagerID (1)
= GAME_DEVELOPMENT.ManagerID (1) ;</td><td>3</td></tr>
</table>

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Question	Answer	Marks
7(a)	**1 mark** for device, **1 mark** for matching purpose. **Max 2** devices. • Router • To connect (devices) / the servers to the Internet // to transmit data between the servers and the Internet // to forward data towards its destination • Gateway • To connect a server that uses a different protocol to the Internet // to join two different types of network • Modem • To connect (the servers) to the Internet over a telephone line • Network interface card // NIC • To enable the servers to connect to the (company) network	**4**
7(b)	**1 mark** per bullet point, **max 1** for benefit, **max 1** for drawback Benefit: • (Consistently) faster data transmission • More stable connection Drawback: • High initial cost as new hardware will be needed • Expertise required to complete connections	**2**
7(c)(i)	**1 mark** per bullet point to **max 3** • The web page may have interactive features • Created using JavaScript • E.g. text box, buttons • Validates the input client-side • Handles the data returned from the server-side script	**3**
7(c)(ii)	**1 mark** per bullet point to **max 3** • Database on the server is accessed • Using PHP • Searches for the data the user entered • Returns the song // Returns a message to say song not found	**2**
7(d)(i)	**1 mark** per bullet point to **max 2** • Prevents unauthorised access to the data • Monitors incoming and outgoing traffic • Blocks transmissions from unauthorised sources / websites / ports • Maintains an allow list / deny list of IP addresses	**2**

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Question	Answer	Marks
7(d)(ii)	**1 mark** only from: • Running up-to-date antivirus software • Use of proxy server • Strong / Biometric passwords • Etc.	**1**

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