Cambridge Assessment International Education

Cambridge IGCSE™

COMPUTER SCIENCE **0478/11**

Paper 1 **October/November 2020**

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.

Cambridge International is publishing the mark schemes for the October/November 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

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PUBLISHED

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.

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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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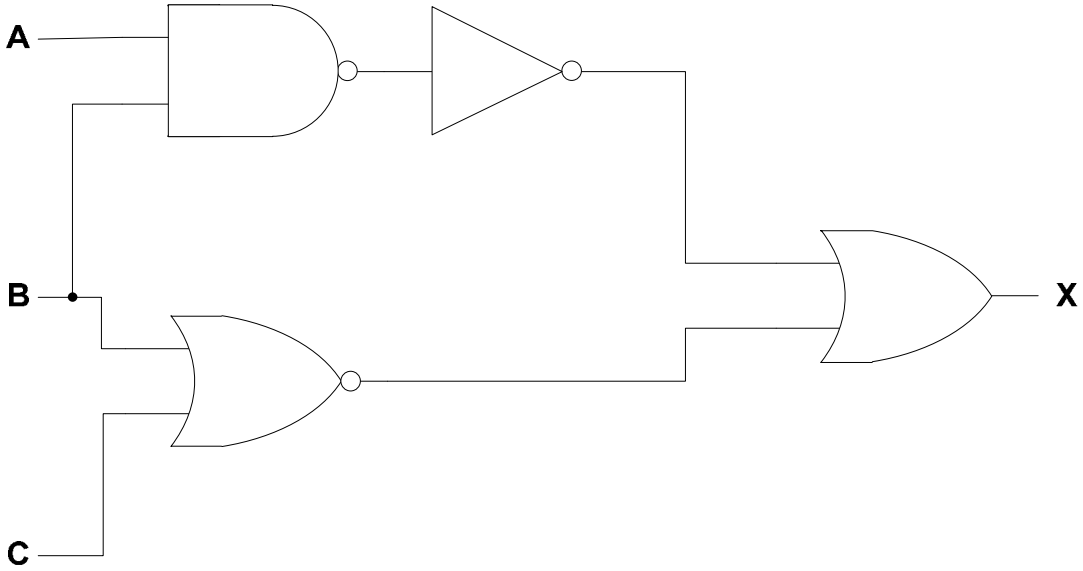
Question	Answer	Marks
1	**One** mark per each correct row: **Device** / **Input** (✓) / **Output** (✓) / **Storage** (✓) Keyboard / ✓ / / Sensor / ✓ / / 3D Cutter / / ✓ / 2D Scanner / ✓ / / Microphone / ✓ / / Hard disk drive (HDD) / / / ✓	**6**

Question	Answer	Marks
2(a)	**One** mark for each correct binary conversion **One** mark for each correct denary conversion **Hexadecimal ticket number** / **12-bit binary value** / **Denary value** 028 / **0000 0010 1000** / **40** 1A9 / **0001 1010 1001** / **425** 20C / **0010 0000 1100** / **524**	**6**

Question	Answer	Marks
2(b)	**Seven** from: – Camera captures code // Laser/light shone on code – Black squares reflect different light to white – Corner squares are used for alignment – Pattern converted to digital data // by example – (Digital) data sent to microprocessor – There is a database of valid QR codes – Data compared to stored values/valid QR codes … – … If data matches entry is granted is raised – … If data matches count is incremented – … If data does not match, entry is denied	**7**

Question	Answer	Marks
3(a)	– Handshake – Record	**2**
3(b)	– Web server – Certificate – Authentic – Browser – Signal	**5**
3(c)	Any **one** from: – SSL – HTTPS	**1**

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Question	Answer	Marks
4(a)	 **One** mark for each correct gate with correct input	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4(b)</td><td>
Four marks for 8 correct outputs
Three marks for 6/7 correct outputs
Two marks for 4/5 correct outputs
One mark for 2/3 correct outputs

<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>0</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>0</td></tr>
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<tr><td>1</td><td>1</td><td>1</td><td></td><td>1</td></tr>
</table>
</td><td>4</td></tr>
</table>

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4(c)</td><td>One mark for the correct gate and one mark for the correct truth table

– AND
<table>
<tr><td>A</td><td>B</td><td>X</td></tr>
<tr><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>1</td></tr>
</table>
– XOR
<table>
<tr><td>A</td><td>B</td><td>X</td></tr>
<tr><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td></tr>
</table></td><td>4</td></tr>
</table>

Question	Answer	Marks
5(a)(i)	– **Two** valid examples of Structure e.g. where text is placed, margins of page	**2**
5(a)(ii)	– **Two** valid examples of Presentation e.g. font size, font colour	**2**
5(b)	– Firewall – Proxy server	**2**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)(i)</td><td>– Uses multiple wires
– Sends multiple bits of data at a time</td><td>2</td></tr>
<tr><td>6(a)(ii)</td><td>– Faster transmission speed</td><td>1</td></tr>
<tr><td>6(b)(i)</td><td>– Control (bus)</td><td>1</td></tr>
<tr><td>6(b)(ii)</td><td>– Accumulator (ACC)</td><td>1</td></tr>
<tr><td>6(b)(iii)</td><td>
<table>
<tr><th>Statement</th><th>True (✓)</th><th>False (✓)</th></tr>
<tr><td>Data and instructions are stored in the same memory unit</td><td>✓</td><td></td></tr>
<tr><td>The control unit manages operations within the CPU</td><td>✓</td><td></td></tr>
<tr><td>Data and instructions can be fetched into the CPU at the same time</td><td></td><td>✓</td></tr>
<tr><td>The control unit is responsible for decoding an instruction</td><td>✓</td><td></td></tr>
</table>
</td><td>4</td></tr>
</table>

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Question	Answer	Marks
7	**Four** from (Max **two** per format): MIDI – Musical Instrument Digital Interface (file) – Stores a set of commands/instructions (for how the sound should be played) – Does not store the actual sounds – Data in the file has been recorded using digital instruments // produced by synthesizer – Specifies pitch of the note // specifies the note to be played – Specifies when each note plays and stops playing // Specifies key on/off – Specifies duration of the note – Specifies volume of the note – Specifies the tempo – Specifies the type of instrument – Individual notes can be edited MP3 – MP3 is a format for digital audio – MP3 is an actual recording of the sound – MP3 is a (lossy) compression format – Recorded using a microphone	**4**

Question	Answer	Marks
8(a)	Any **three** from: – Light emitting diodes (technology) – The **display** is made up of pixels – … that are arranged together as a matrix – … each is formed of three LEDs/filters – Shades of colour are achieved by mixing red, blue and green – The screen can be back-lit/edge-lit NOTE: Use of liquid crystals with LED technology can also be awarded	**3**

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Question	Answer	Marks
8(b)	Any **three** from: – Energy efficient // low power consumption – Long lasting // longevity – Focussed beam // less light strays from beam – Brighter/vivid colours – High resolution – No flicker – Display is thinner – Mercury free technology // environmentally friendly – Fewer pixel failure – Increased viewing in sunlight	**3**
8(c)	– LCD	**1**

Question	Answer	Marks
9(a)	– 1 – 0 – 0 – 0	**4**
9(b)	**Two** from: – Checksum – Automatic repeat request // ARQ	**2**
9(c)	Any **four** from: – Data is **input** with check digit – A calculation is performed on the (inputted) data // by example – The calculated digit is compared to a stored value – If it matches, the data entered is correct – If it does not match, the data entered is incorrect	**4**

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