Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/13**

Paper 1 **October/November 2017**

MARK SCHEME

Maximum Mark: 75

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

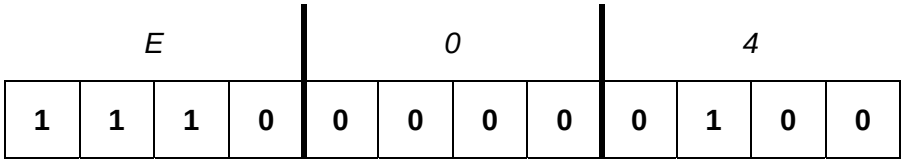
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Question	Answer	Marks
1(a)	Output	**1**
1(b)	1 mark for each correct conversion  	**3**
1(c)	Any **one** from: – Hexadecimal codes can fit in a smaller display rather than a full text based message – Smaller amount of memory needed to store the hex error messages than text based	**1**
1(d)	1 mark for correct sensor, 1 mark for corresponding use Possible examples could include: – Temperature (sensor) – To monitor the temperature of the water – Pressure (sensor) – To monitor the level of water in the washing machine – Motion (sensor) – To monitor whether the drum is still in motion – pH (sensor) – To monitor the level of water hardness/detergent present in the water	**6**

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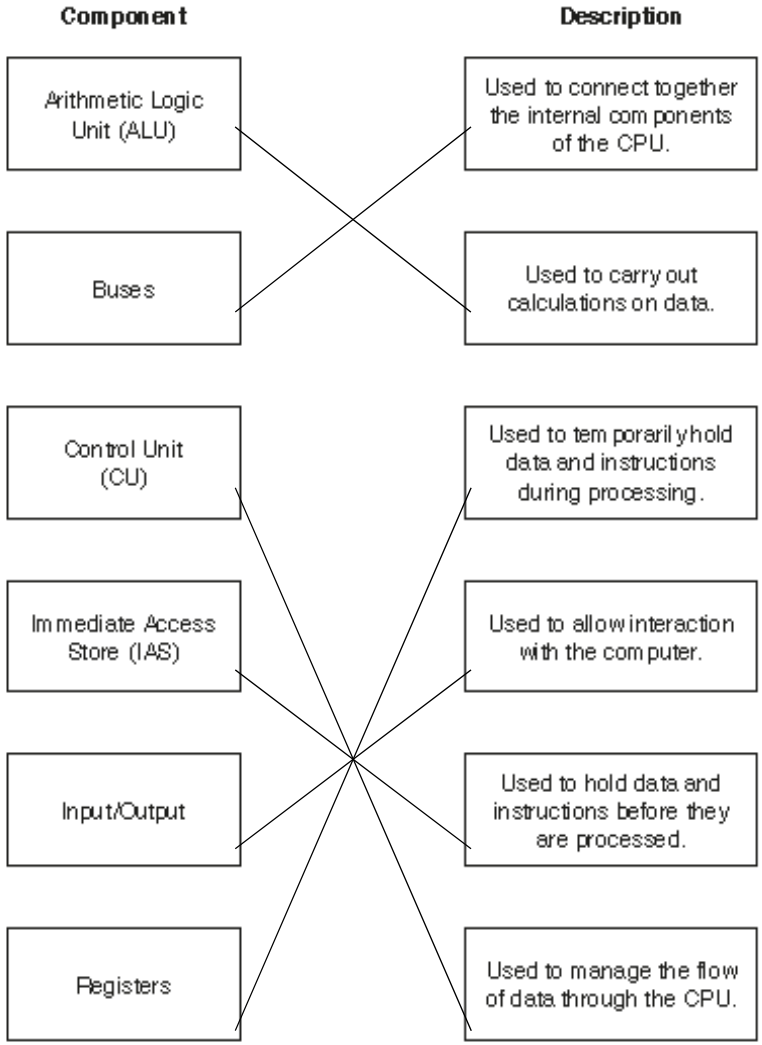
<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2</td><td>1 mark for each correct file format e.g.

<table>
<tr><th>File type</th><th>File format</th></tr>
<tr><td>Pictures</td><td>.JPEG</td></tr>
<tr><td>Text</td><td>.doc, .txt, .rtf, .docx, .odt .pdf</td></tr>
<tr><td>Sound</td><td>.mp3, .wav, .aif, .flac, .mid</td></tr>
<tr><td>Video</td><td>.mp4, .flv, .wmv</td></tr>
</table>
</td><td>3</td></tr>
</table>

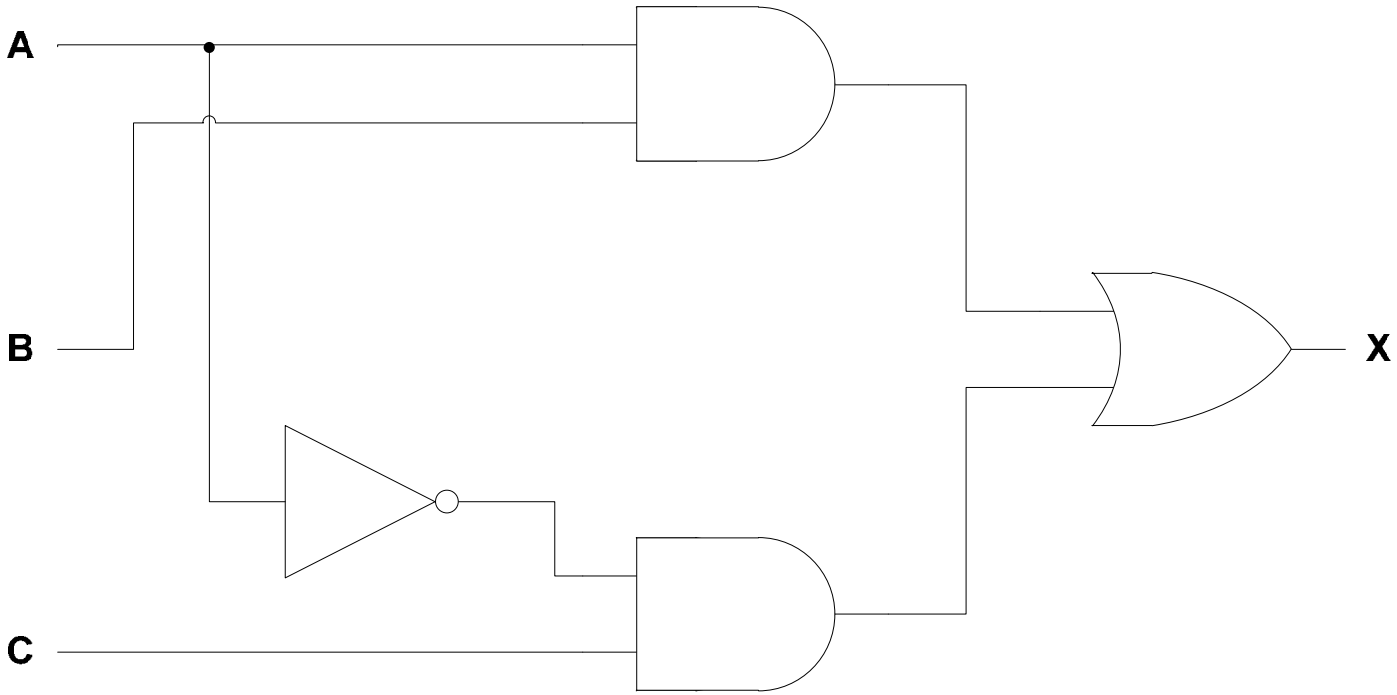
Question	Answer	Marks
3(a)	– Part 1 (access) protocol – Part 2 domain (name) – Part 3 filename	**3**
3(b)	**Four** from: – IP address is used to identify a device (on the Internet / network) – IP address is allocated by the network/ ISP – Can be used in place of URL – IP addresses can be IPv4 or IPv6 – IP address can be static … – ... meaning it doesn't change each time it is connected to the Internet – IP address can be dynamic …. – … meaning that it can change each time a device is connected to the Internet – Any valid example (e.g. xxx.xxx.xxx.xxx or xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx)	**4**

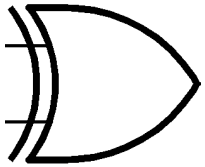
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Question	Answer	Marks
4	1 mark for each correct line up to a total of 5 marks	**5**



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Question	Answer	Marks
5(a)	1 mark for each correct logic gate 	**4**

Question	Answer	Marks
5(b)	1 mark for correct logic gate symbol:  Any **four** from: – similar to an OR gate – It has (at least) two inputs – Output will be high/1 if both inputs are different – Output will be high/1 if either input is high – Output will be low/0 if both inputs are high – Output will be low/0 if both inputs are low	**5**

Question	Answer	Marks
6	Any **six** from: 2D – (Scanner) shines a light onto the surface of a document // Light moves across document – Reflected light is captured – Uses mirrors and lenses – Captured image is converted into a digital file – Produces a 2D digital image 3D – Scanners shines a laser (or light) over the surface of a 3D object – Records measurements of the geometry/dimensions of the object – Measurements are converted to digital file – Produces a 3D digital model	**6**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>7</td><td>1 mark for each correct tick

<table>
<tr><th>Statement</th><th>true (✓)</th><th>false (✓)</th></tr>
<tr><td>Firewalls can monitor incoming and outgoing traffic.</td><td>✓</td><td></td></tr>
<tr><td>Firewalls operate by checking traffic against a set of rules.</td><td>✓</td><td></td></tr>
<tr><td>Firewalls cannot block access to a certain website.</td><td></td><td>✓</td></tr>
<tr><td>Firewalls can be software and hardware.</td><td>✓</td><td></td></tr>
<tr><td>Firewalls can act as intermediary servers.</td><td></td><td>✓</td></tr>
<tr><td>Firewalls can block unauthorised traffic.</td><td>✓</td><td></td></tr>
</table>
</td><td>6</td></tr>
</table>

Question	Answer	Marks
8(a)	Any **three** from: – Human error (e.g. deleting/overwriting data) – Physical damage – Power failure/surge – Hardware failure – Software crashing	**3**
8(b)	Any **three** from: – Online shopping // Online payment systems // Online booking – Email – Cloud based storage – Intranet/extranet – VPN – VoIP // video conferencing – Instant messaging (IM) // social networking // online gaming	**3**

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Question	Answer	Marks
8(c)	1 mark for identifying, 1 mark for description – Strong password – To make it difficult to hack an account – Biometric device – To use data that is difficult to fake as a password – TLS // Encryption – To make data meaningless if intercepted – To encrypt data that is exchanged (TLS only) – More secure than SSL (TLS only) – Anti-spyware (software) – To find and remove any spyware that is installed on a computer – To help stop key loggers recording key presses – Firewall – To help prevent unauthorised access to an account – Blocks any requests that do not meet/match the criteria – Authentication (card reader at home)/mobile security code app/two-step verification – To add another level of identification of the user – Use of drop-down boxes (or equivalent) – So key loggers cannot record the key presses – Proxy server – To divert an attack away from the main system	**6**

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Question	Answer	Marks
9(a)	Any **four** from: – (Red) laser is used – (Laser beams) shines onto surface of the disk – It is rotated (at a constant speed) to be read – Surface is covered in a track (that spirals from the centre) – Data is represented on the surface using pits and lands – Pits and lands represent binary values – Pits reflect light back differently (to the area in between/land) – Optical device can determine the binary value from the light reflection	**4**
9(b)	1 mark for calculation, 1 mark for correct answer: – 1000 × 16 – 16000/8 – Answer is **2000** bytes	**2**
9(c)	**Four** from: (Max 2 for either primary or secondary) – Primary RAM and ROM – Secondary HDD and SSD – Primary is directly accessible by CPU – Secondary is not directly accessible by CPU – Primary is internal to computer – Secondary can be internal **or** external to the computer – Primary stores boot up instructions **and** can hold data whilst being processed – Secondary stores files/software – Primary has faster access speed – Secondary has a slower access speed – Primary has both volatile **and** non-volatile – Secondary is non-volatile	**4**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>10</td><td>1 mark for each correct tick

<table>
<tr><th>Statement</th><th>true (✓)</th><th>false (✓)</th></tr>
<tr><td>Assembly language uses mnemonic codes.</td><td>✓</td><td></td></tr>
<tr><td>Assembly language programs do not need a translator to be executed.</td><td></td><td>✓</td></tr>
<tr><td>Assembly language is a low-level programming language.</td><td>✓</td><td></td></tr>
<tr><td>Assembly language is specific to the computer hardware.</td><td>✓</td><td></td></tr>
<tr><td>Assembly language is machine code.</td><td></td><td>✓</td></tr>
<tr><td>Assembly language is often used to create drivers for hardware.</td><td>✓</td><td></td></tr>
</table>
</td><td>6</td></tr>
</table>

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