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**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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| Question | Answer | Marks |
|---|---|---|
| 1(a) | Output | **1** |
| 1(b) | 1 mark for each correct conversion<br>*E* *0* *4*<br>**1 1 1 0 0 0 0 0 0 1 0 0** | **3** |
| 1(c) | Any **one** from:<br>– Hexadecimal codes can fit in a smaller display rather than a full text based message<br>– 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<br>Possible examples could include:<br><br>– Temperature (sensor)<br>– To monitor the temperature of the water<br><br>– Pressure (sensor)<br>– To monitor the level of water in the washing machine<br><br>– Motion (sensor)<br>– To monitor whether the drum is still in motion<br><br>– pH (sensor)<br>– To monitor the level of water hardness/detergent present in the water | **6** |

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| Question | Answer | Marks |
|---|---|---|
| 2 | 1 mark for each correct file format e.g.<br><br>**File type** / **File format**<br>Pictures: .JPEG<br>Text: .doc, .txt, .rtf, .docx, .odt .pdf<br>Sound: .mp3, .wav, .aif, .flac, .mid<br>Video: .mp4, .flv, .wmv | **3** |

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

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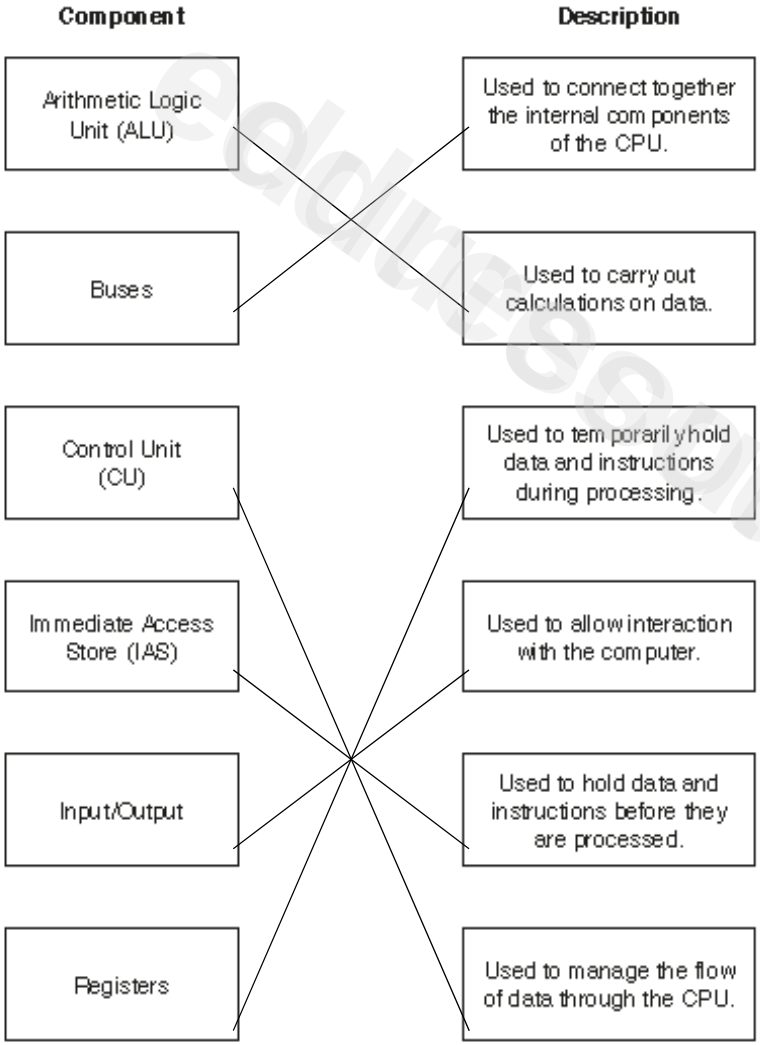
| Question | Answer | Marks |
|---|---|---|
| 4 | 1 mark for each correct line up to a total of 5 marks | 5 |

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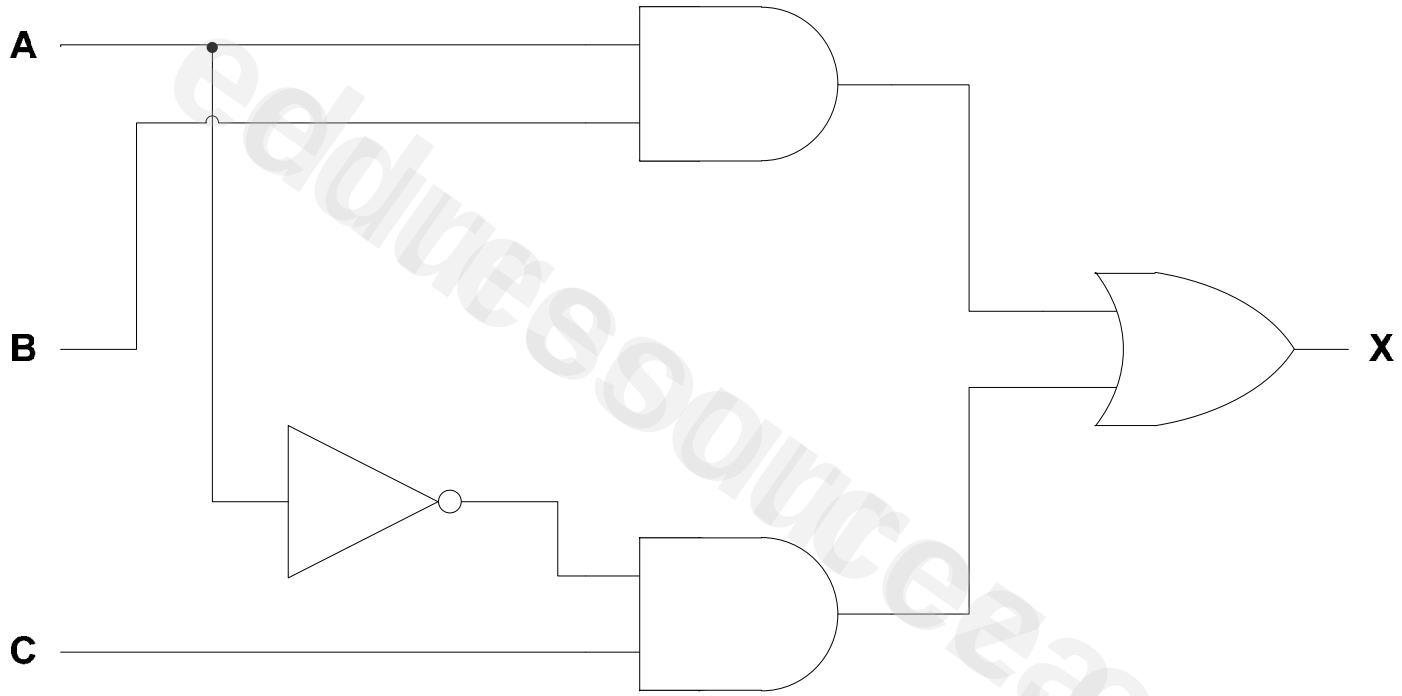
| Question | Answer | Marks |
|---|---|---|
| 5(a) | 1 mark for each correct logic gate   | 4 |

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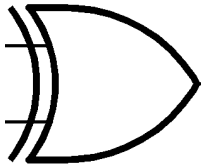
| Question | Answer | Marks |
|---|---|---|
| 5(b) | 1 mark for correct logic gate symbol:<br>  <br>Any **four** from:<br>– similar to an OR gate<br>– It has (at least) two inputs<br>– Output will be high/1 if both inputs are different<br>– Output will be high/1 if either input is high<br>– Output will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

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

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| Question | Answer | Marks |
|---|---|---|
| 7 | 1 mark for each correct tick | 6 |

| Statement | true (✓) | false (✓) |
|---|---|---|
| Firewalls can monitor incoming and outgoing traffic. | ✓ | |
| Firewalls operate by checking traffic against a set of rules. | ✓ | |
| Firewalls cannot block access to a certain website. | | ✓ |
| Firewalls can be software and hardware. | ✓ | |
| Firewalls can act as intermediary servers. | | ✓ |
| Firewalls can block unauthorised traffic. | ✓ | |

| Question | Answer | Marks |
|---|---|---|
| 8(a) | Any **three** from:<br>– Human error (e.g. deleting/overwriting data)<br>– Physical damage<br>– Power failure/surge<br>– Hardware failure<br>– Software crashing | 3 |
| 8(b) | Any **three** from:<br>– Online shopping // Online payment systems // Online booking<br>– Email<br>– Cloud based storage<br>– Intranet/extranet<br>– VPN<br>– VoIP // video conferencing<br>– 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<br><br>– Strong password<br>– To make it difficult to hack an account<br><br>– Biometric device<br>– To use data that is difficult to fake as a password<br><br>– TLS // Encryption<br>– To make data meaningless if intercepted<br>– To encrypt data that is exchanged (TLS only)<br>– More secure than SSL (TLS only)<br><br>– Anti-spyware (software)<br>– To find and remove any spyware that is installed on a computer<br>– To help stop key loggers recording key presses<br><br>– Firewall<br>– To help prevent unauthorised access to an account<br>– Blocks any requests that do not meet/match the criteria<br><br>– Authentication (card reader at home)/mobile security code app/two-step verification<br>– To add another level of identification of the user<br><br>– Use of drop-down boxes (or equivalent)<br>– So key loggers cannot record the key presses<br><br>– Proxy server<br>– To divert an attack away from the main system | **6** |

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

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| Question | Answer | Marks |
|---|---|---|
| 10 | 1 mark for each correct tick | 6 |

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

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