Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/11**

Paper 1 **October/November 2017**

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.

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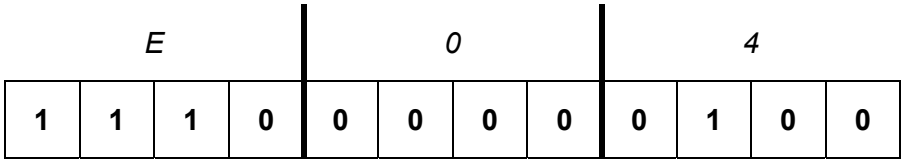
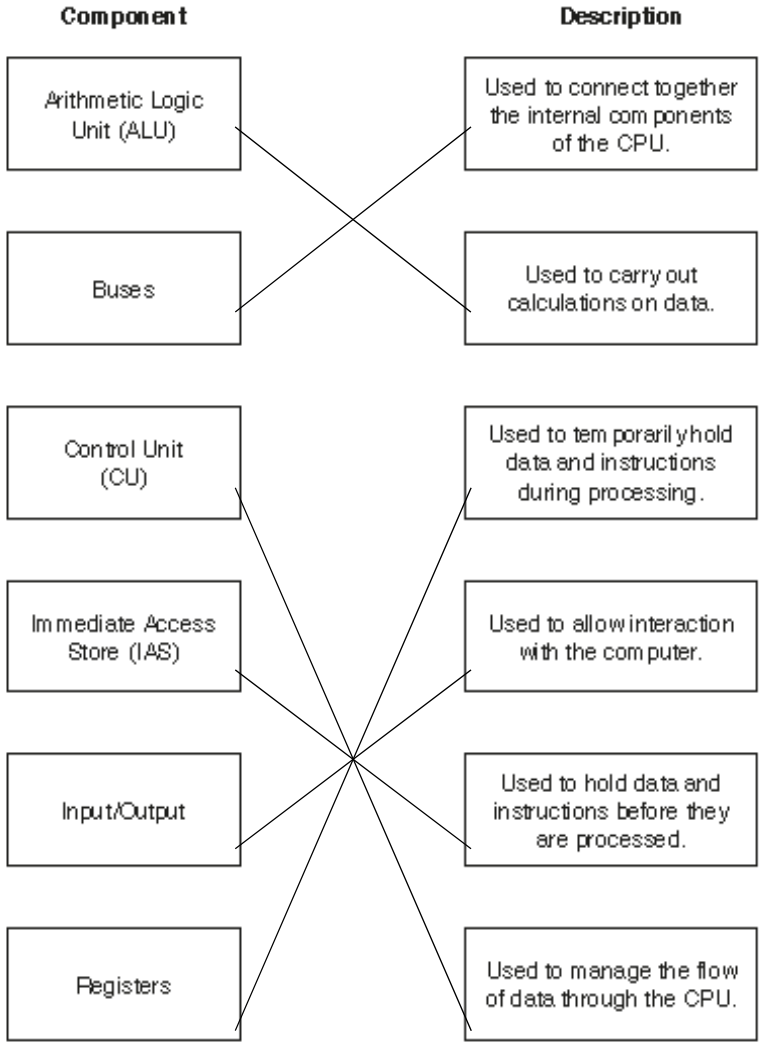
This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

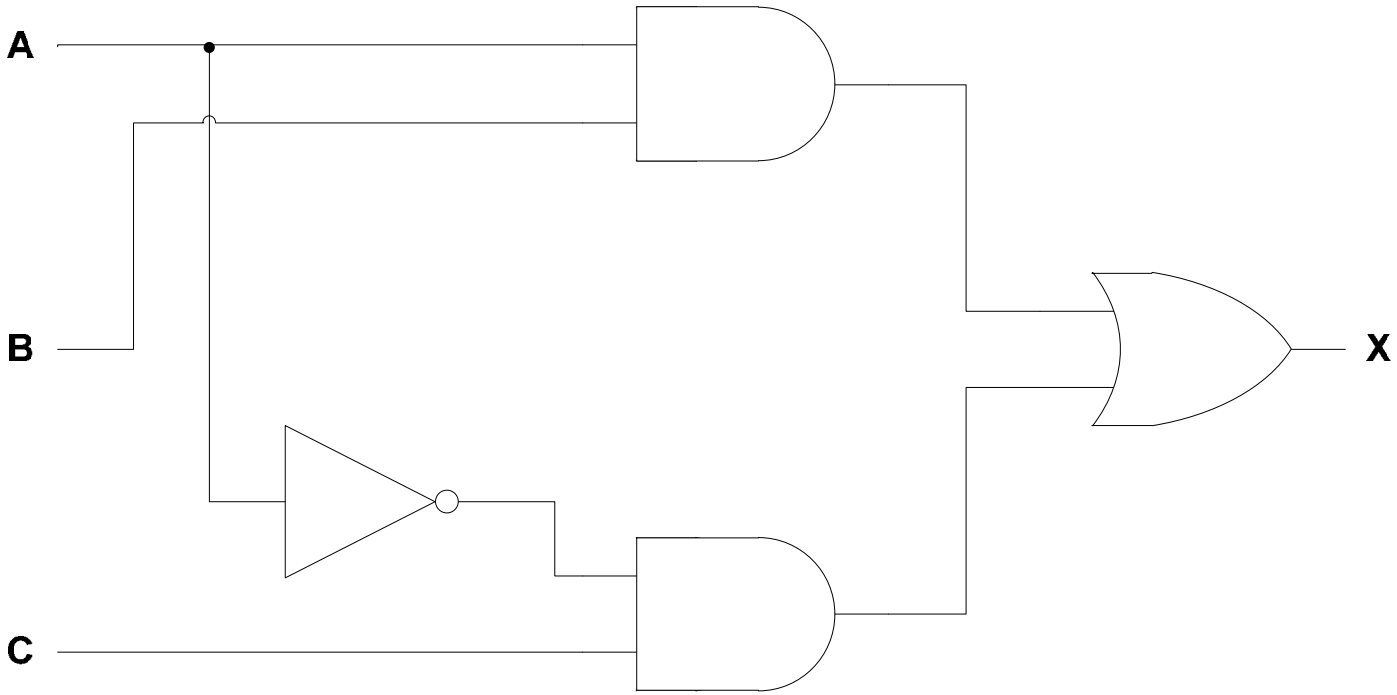
Question	Answer	Marks
1(a)	Output	**1**
1(b)	1 mark for each correct conversion  	**3**
1(c)	Any **one** from: – Hexadecimal codes can fit in a smaller display rather than a full text based message – Smaller amount of memory needed to store the hex error messages than text based	**1**
1(d)	1 mark for 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**

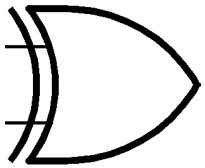
Question	Answer	Marks
2	1 mark for each correct file format e.g. **File type** / **File format** Pictures / .JPEG Text / .doc, .txt, .rtf, .docx, .odt .pdf Sound / .mp3, .wav, .aif, .flac, .mid Video / .mp4, .flv, .wmv	**3**

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**

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



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**

<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**

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**

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**

<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>