Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/13**

Paper 1 **May/June 2017**

MARK SCHEME

Maximum Mark: 75

Published

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Question	Answer	Marks
1(a)	1 mark for **any** two correct values, 2 marks for all 4 correct values. 29FC	**2**
1(b)	**Two** from: • Easier/quicker to understand/read • Easier to debug/identify errors • Fewer digits are used / shorter // takes up less space on screen // more can be shown on screen / page	**2**
1(c)	**Two** from: • Notations for colour in HTML // HTML colour (codes) • Error messages • MAC address // IP address • Locations in memory • Memory dump	**2**

Question	Answer	Marks
2(a)	**Two** from: • Closer to human language // closer to English • Independent of a particular type of computer/device/platform // portable language • A language such as Python, Java, Pascal, etc. (any suitable example)	**2**
2(b)	**One** from: • Compiler • Interpreter	**1**
2(c)	Must relate to answer given in 2b. No follow through for incorrect answer in part 2b. **Compiler** – **Three** from: • Translates the whole program as a complete unit / at once • Creates an executable file / object code • A report / list of errors in the code is created • Optimises the source code (to run efficiently) **Interpreter** – **Three** from: • Translates a program one line of code at a time • Machine code is directly executed // The interpreter is used each time the program / code is executed • Will identify an error as soon as it finds one in a line of code	**3**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3</td><td>1 mark per correct tick

<table>
<tr><th>Statement</th><th>true (✓)</th><th>false (✓)</th></tr>
<tr><td>47KB is larger than 10MB.</td><td></td><td>✓</td></tr>
<tr><td>250bytes is smaller than 0.5MB.</td><td>✓</td><td></td></tr>
<tr><td>50GB is larger than 100MB.</td><td>✓</td><td></td></tr>
<tr><td>1TB is smaller than 4GB.</td><td></td><td>✓</td></tr>
</table></td><td>4</td></tr>
</table>

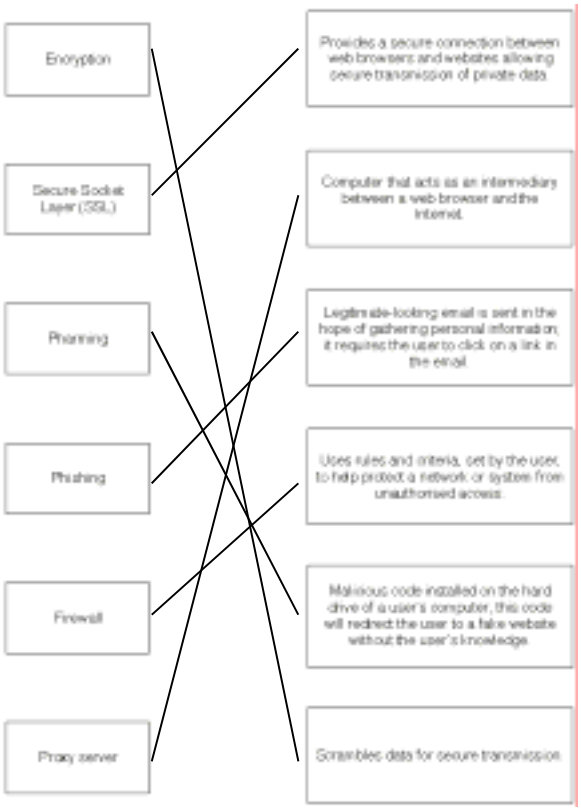
<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4</td><td>1 mark per correct tick

<table>
<tr><th>Statement</th><th>True</th><th>False</th></tr>
<tr><td>Data is transmitted in one direction only, one bit at a time.</td><td></td><td>✓</td></tr>
<tr><td>Data is transmitted in both directions, multiple bits at a time.</td><td></td><td>✓</td></tr>
<tr><td>Data is transmitted in one direction only, multiple bits at a time.</td><td></td><td>✓</td></tr>
<tr><td>Data is transmitted in both directions, but only one direction at a time. Data is transmitted one bit at a time.</td><td>✓</td><td></td></tr>
<tr><td>Data is transmitted in both directions, but only one direction at a time. Data is transmitted multiple bits at a time.</td><td></td><td>✓</td></tr>
</table></td><td>5</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)</td><td>1 mark per correct tick

<table><tr><th>Received byte</th><th>corrupted during transmission (✓)</th><th>not corrupted during transmission (✓)</th></tr><tr><td>10110100</td><td>✓</td><td></td></tr><tr><td>01101101</td><td></td><td>✓</td></tr><tr><td>10000001</td><td>✓</td><td></td></tr></table></td><td>3</td></tr>
<tr><td>5(b)</td><td>Four from:
• Uses acknowledgement and time out
• Check performed on received data // error is detected by e.g. parity check, check sum
• If error detected, request sent to resend data // negative acknowledgment is used
• If no acknowledgement is sent that data is received // positive acknowledgement is used
• Data is resent / Resend request repeated, till data is resent correctly …
• … or request times out // limit is reached</td><td>4</td></tr>
</table>

Question	Answer	Marks
6	1 mark for correct bus name and up to 2 further marks for appropriate purpose. **Address (bus)** **Two** from: • Carries / transports an address / location … • … of the next item to be fetched • Data travels one way (unidirectional) **Data (bus)** **Two** from: • Carries / transports data / example of data ... • … that is currently being processed // that will be / has been processed • Data can travel in both directions (bidirectional) **Control (bus)** **Two** from: • Carries / transports signals • Control / directs the actions of the CPU / processor • Can be either Unidirectional or Bidirectional	**6**

Question	Answer	Marks
7	 1 mark for correct line till 5 marks given.	**5**

Question	Answer	Marks
8	• Secondary • HDD/SSD • SSD/HDD • Primary • ROM/RAM • RAM/ROM	**6**

Question	Answer	Marks
9	1 mark for appropriate device name and 1 further mark for appropriate purpose. **Input devices** **Two** from: • **Keypad / Keyboard** … • … e.g. to allow customer to input the quantity of an item • **Touchscreen** … • … e.g. to allow a customer to select a payment method • **Barcode scanner / Barcode reader** … • … e.g. to allow a customer to scan in their shopping • **Card reader // Cash deposit / intake** … • … e.g. to allow a customer to pay for their shopping • **Weighing scales** … • … e.g. to allow a customer to weigh fresh produce **Output devices** **One** from: • **Display / Touchscreen** … • … e.g. to allow a customer to see the running total of their shopping • **Speaker** … • … e.g. to give audio instructions to a customer about how to use the self-checkout • **Printer** … • … e.g. to print a receipt for the customer	**6**

Question	Answer	Marks
10(a)	1 mark for four correct outputs only A | B | Output 0 | 0 | **1** 0 | 1 | **0** 1 | 0 | **0** 1 | 1 | **0**	**1**
10(b)	1 mark for each correct section of the statement • (A AND B) • AND • (C OR NOT B)	**3**

Question	Answer	Marks
11	**Three** from e.g. : • (Provides an) interface • Loads / opens / installs / closes software • Manages the hardware // manages peripherals // spooling • Manages the transfer of programs into and out of memory • Divides processing time // processor management • Manages file handling • Manages error handling // manages interrupts • Manages security software • Manages utility software • Manages user accounts • Multitasking • Multiprogramming // time slicing • Batch processing	**3**

Question	Answer	Marks
12(a)	1 mark for appropriate sensor and 1 further mark for appropriate use. **Two** from: • **Gas (sensor)** … • … e.g. to measure the levels of oxygen/carbon dioxide / nitrogen in the factory to make sure they are not too high / low • **Temperature (sensor)** … • … e.g. to measure the temperature of the chemicals to make sure it is not too high/low • **Motion / Infra-red (sensor)** … • … e.g. to detect any persons in an unauthorised area of the factory • **Pressure (sensor)** … • … e.g. to measure the pressure of chemicals flowing through pipes to check that level are not too high / low • **pH (sensor)** … • … to measure the pH to make sure the acidity / alkalinity of the chemicals is correct • **Light (sensor)** … • … to measure the level of light to make sure it remains at a constant level for the chemical process	**4**
12(b)	**Five** from: • Sensors send signals to microprocessor • Analogue signals are converted to digital (using ADC) • Microprocessor compares value to stored value … • … If out of range / matches stored values … • … signal sent to alert workers (e.g. sound alarm) • … microprocessor send signal to cause an action to occur e.g. cool a process down, heat a process up, add a chemical • … no action taken • Output/record readings • Monitoring is continuous	**5**

Question	Answer	Marks
13(a)	**Two** from: • Smaller file to transmit • The file is transmitted quicker • Uses / requires less bandwidth	**2**
13(b)(i)	• Lossless (compression) … • … It is important the code must be (exactly) the same as the original file • … If it does not match the original file it will not work	**3**
13(b)(ii)	• Lossy (compression) … • … It would make the file smaller than lossless compression / the file would stream faster than lossless compression • … The quality of the video can be reduced but it can still be viewed	**3**

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