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COMPUTER SCIENCE

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MARK SCHEME

Maximum Mark: 75

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This document consists of **8** printed pages.

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

Question	Answer	Marks															
3	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>	Statement	true (✓)	false (✓)	47KB is larger than 10MB.		✓	250bytes is smaller than 0.5MB.	✓		50GB is larger than 100MB.	✓		1TB is smaller than 4GB.		✓	4
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5(a)	1 mark per correct tick <table border="1"> <thead> <tr> <th>Received byte</th><th>corrupted during transmission (✓)</th><th>not corrupted during transmission (✓)</th></tr> </thead> <tbody> <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> </tbody> </table>	Received byte	corrupted during transmission (✓)	not corrupted during transmission (✓)	10110100	✓		01101101		✓	10000001	✓		3
Received byte	corrupted during transmission (✓)	not corrupted during transmission (✓)												
10110100	✓													
01101101		✓												
10000001	✓													
5(b)	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 acknowledgment is used • Data is resent / Resend request repeated, till data is resent correctly ... • ... or request times out // limit is reached	4												

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 <table border="1"> <thead> <tr> <th>A</th><th>B</th><th>Output</th></tr> </thead> <tbody> <tr> <td>0</td><td>0</td><td>1</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>0</td></tr> </tbody> </table>	A	B	Output	0	0	1	0	1	0	1	0	0	1	1	0	1
A	B	Output															
0	0	1															
0	1	0															
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1	1	0															
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 <u>converted to digital</u> (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