Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/12**

Paper 1 **October/November 2017**

MARK SCHEME

Maximum Mark: 75

Published

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Question	Answer	Marks
1	1 mark per correct instruction: 9 – LEFT 1 – DOWN C – OPEN 3 – CLOSE F – UP	**5**

Question	Answer	Marks
2	1 mark for each correct category: *HDD* – Secondary *RAM* – Primary *ROM* – Primary *CD-ROM* – Off-line *SSD* – Secondary *DVD-RAM* – Off-line	**6**

Question	Answer	Marks
3(a)	Any **four** from (**Max 2** per number system) : • A binary number system is a base-2 system • A denary number system is a base-10 system • A binary number system uses 0 and 1 values • A denary number system uses 0 to 9 values • A binary number system has units/ placeholders/column headings that increase by the power of 2 • A denary number system has units/ placeholders/column headings that increase by the power of 10 • Binary has more digit <u>for the same value</u>// Denary has less digits <u>for the same value</u>	**4**

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Question	Answer	Marks
3(b)	**Five** from: • Correct column headings / place holders by example • Correctly place a 1 or a 0 for each column • Identify the columns to be added • Add together the (denary) values identified … • … this will give a total which is the denary number/answer • Answer is 10	**5**

Question	Answer	Marks
4(a)(i)	<table><tr><th>Method 1</th><th>Tick (✓)</th><th>Method 2</th><th>Tick (✓)</th></tr><tr><td>Serial</td><td>✓</td><td>Simplex</td><td></td></tr><tr><td>Parallel</td><td></td><td>Half-duplex</td><td></td></tr><tr><td></td><td></td><td>Duplex</td><td>✓</td></tr></table>	**2**
4(a)(ii)	Any **four** from (**Max 3** for serial): • Serial has <u>less/lower</u> interference • Serial is (more) reliable/accurate <u>over distances</u> • In serial the bits won't be skewed • In serial it is easier to collate the bits together again after transmission • Duplex transmits data in both directions <u>at the same time</u> • simplex/half-duplex/remaining methods won't allow read and write at same time	**4**

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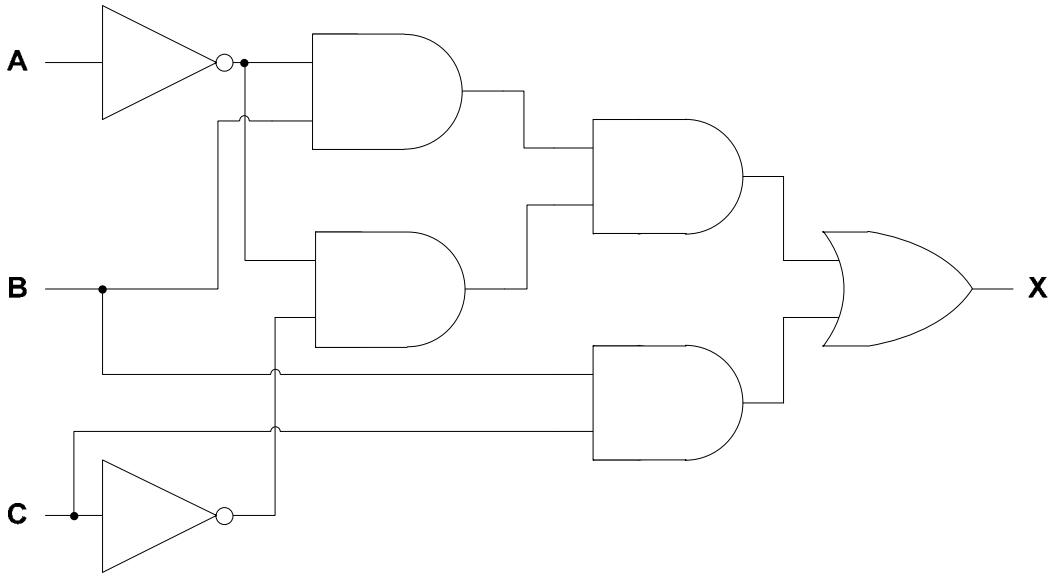
Question	Answer	Marks
4(b)	1 mark for error checking method, 2 marks for description: Checksum • A value is calculated from the data // Description of calculation • Value is transmitted with data • Value is recalculated after transmission • If the values match the data is (more likely to be) accurate Parity check • A parity bit is transmitted with each byte of data • Odd or even (parity can be used) • Counts / checks number of 1's // counts / checks to see if 1's are even // counts / checks to see if 1's are odd • (Each byte is) checked after transmission to see if it matches the odd/even parity used Automatic Repeat Request (ARQ) • Uses acknowledgement and timeout • When a device detects an error in data transmission it asks for the packet to be resent / no error detected, positive acknowledgment sent • The sending device resends the packet after the request to resend/ timeout received • This process is continuous until the packet received is correct/until the ARQ limit is reached Echo (check) • Copy of data is sent back to sender • Data is compared to see if it matches • If it does not match error detected	**6**

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Question	Answer	Marks
5(a)	Any **four** from: • Data / files • Stored in a text file • Downloaded to a user's computer when a website is visited // webserver sends to web browser • Stored on a user's computer • Stored by a browser • Detected by the website when it is visited again	**4**
5(b)	Any **two** from: e.g. • To store personal information/data • To store login details • To save items in an online shopping basket • To track/save internet surfing habits // to track website traffic • To carry out targeted advertising • To store payment details • To customise a webpage // to store user preferences • Store progress in online games/quizzes	**2**

Question	Answer	Marks
6	1 mark for each correct term, in this order: • Interrupt • Compiler • ALU/Arithmetic and Logic Unit • ARQ/Automatic repeat request	**4**

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Question	Answer	Marks
7	1 mark for each correct logic gate with the correct input(s)  	**7**

Question	Answer	Marks
8(a)	1 mark for correct calculation method, 1 mark for correct answer: • 2048/1024 (or 1024 × 2) • 2 GB	**2**
8(b)	• Instructions/programs/data • … currently in use	**2**
8(c)	Any **three** from: • RAM is volatile, ROM is non-volatile • RAM is temporary, ROM is (semi) permanent • RAM normally has a larger capacity than ROM • RAM can be edited ROM cannot be edited // Data can be read from and written to RAM, ROM can only be read from.	**3**

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Question	Answer	Marks
9(a)	• It is an input device • It measures/takes (physical) readings of the surrounding environment / environment by example / physical properties	**2**
9(b)	1 mark for each sensor, 2 marks for each description: Moisture (sensor) • To measure the water content of the soil • To alert when the soil is too dry or too wet/needs watering pH (sensor) • To measure how acidic/alkaline the soil is • To alert when there may be something polluting the soil Light (sensor) • To measure the brightness of the environment • To alert when the fruit has too little/too much light Temperature (sensor) • To measure the temperature of the environment • To alert when it is too hot/too cold for the fruit to grow Gas (sensor) • To measure the amount of CO2/oxygen present • To alert when too much CO2/oxygen present Humidity (sensor) • To measure the water content in the air • To alert when the air is too dry Infra-red / motion (sensor) • To measure level of infra-red/microwaves deflected • To alert to any intruders e.g. animals stealing the fruit	**6**

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Question	Answer	Marks
10(a)	Any **three** from: • It is a (security) protocol • It encrypts data (sent over the web/network) • It is the updated version of SSL • It has <u>two</u> layers • It has a handshake layer • It has a record layer	**3**
10(b)	1 mark for each correct application, examples could include: • Online banking • Online shopping // Online payment systems • Email • Cloud based storage • Intranet/extranet • VPN • VoIP • Instant messaging (IM) // social networking	**3**

Question	Answer	Marks
11	1 mark for each correct missing word, in the correct order: • Plagiarism • Free software • Freeware • Shareware • Ethics	**5**

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