Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/12**

Paper 1 **March 2017**

MARK SCHEME

Maximum Mark: 75

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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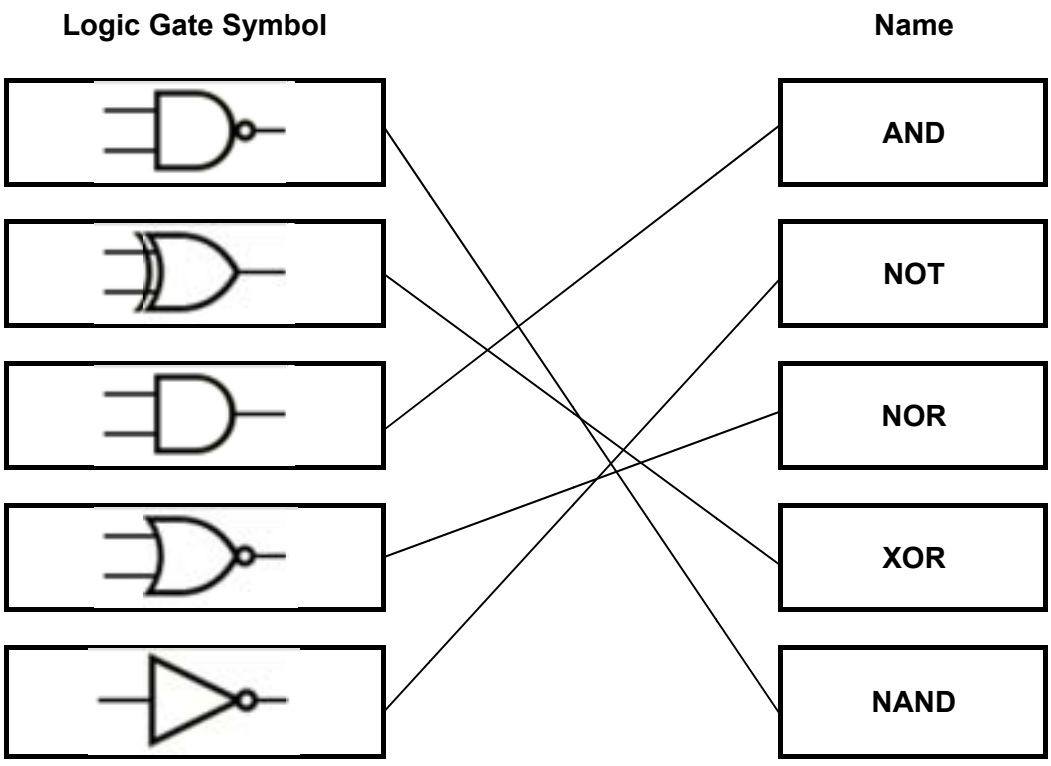
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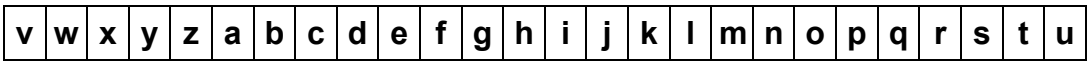
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Question	Answer	Marks
1	Any **three** from: • light • temperature • gas • magnetic field • pressure • moisture • humidity • pH • motion	**3**

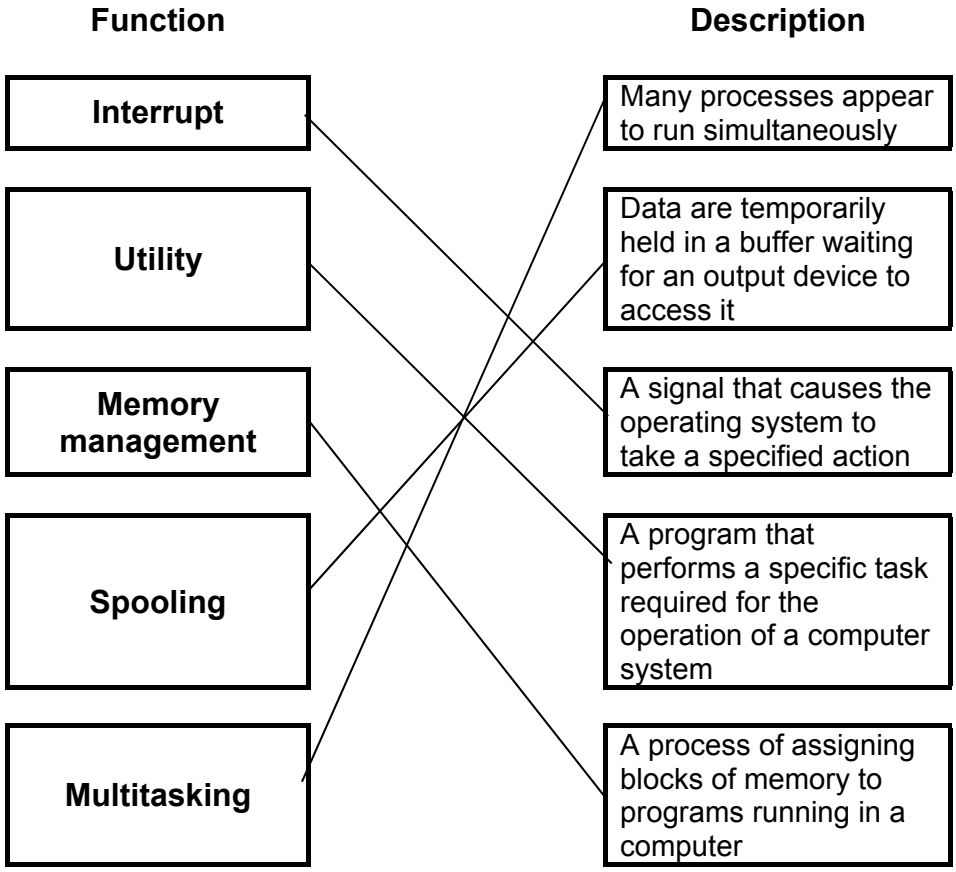
Question	Answer	Marks
2	1 mark for each correctly drawn line to a maximum of 4.  	**4**

Question	Answer	Marks
3(a)	1 mark for: • serial Any **two** from: • serial data transmission more reliable over distance • less likely for the data to be skewed/out of synchronisation • less interference as only a single wire • it is a cheaper connection as only single wire needed // cheaper to set up	**3**
3(b)	• Register 1 – odd • Register 2 – even	**2**
3(c)	Any **one** from: • checksum • ARQ (Automatic Repeat request)	**1**

Question	Answer	Marks
4(a)	• a v m v e q n d i z m h (2 marks, 1 for each correct word)	**2**
4(b)	 **2** marks • shift right • all characters shifted five places	**2**
4(c)	• the first cypher • cannot deduce rest of cypher having identified some characters/more random substitution	**2**

Question	Answer	Marks
5	HTML – HyperText Markup Language / language used to create web pages http – hypertext transfer protocol / protocol used by web browsers https – hypertext transfer protocol secure / secure protocol used by web browsers	**3**

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Question	Answer	Marks
6	1 mark for each correctly drawn line from a function to its description to a maximum of 4  	**4**

Question	Answer	Marks
7	High definition video – lossy (algorithm) – images may contain less detail without noticeable degradation in quality Text – lossless (algorithm) – so that the original and the decompressed text will be exactly the same	**4**

Question	Answer	Marks
8(a)	Denary – 55 Hexadecimal – 37	**2**
8(b)	Binary – (00)111001 Denary – 57 Hexadecimal – 39	**3**
8(c)	**0/1 0/1 0 0 0/1 1 1 1**	**1**

Question	Answer	Marks
9	Any **four** from, must include at least **one** difference: Text based password • (a minimum number of) characters that can be typed at a keyboard • set / can be changed by the user Biometric password • a stored physical measurement e.g. fingerprint • that is compared to a previously scanned human measurement Difference • text based passwords are easier to hack than biometric passwords • biometric passwords are unique to that person/cannot be shared	**4**

Question	Answer	Marks
10	Any **three** from: • barcode 1D **and** QR code 2D • barcodes contain vertical lines **and** QR codes contain 'squares' • QR code can hold more data than a barcode • QR code can be read from any angle, some barcode readers have to be lined up with the barcode // QR codes are more error tolerant / faster to scan than barcodes • barcodes are frequently used at checkouts / libraries // QR codes are used for advertising // QR codes are frequently used by mobile phones to obtain information	**3**

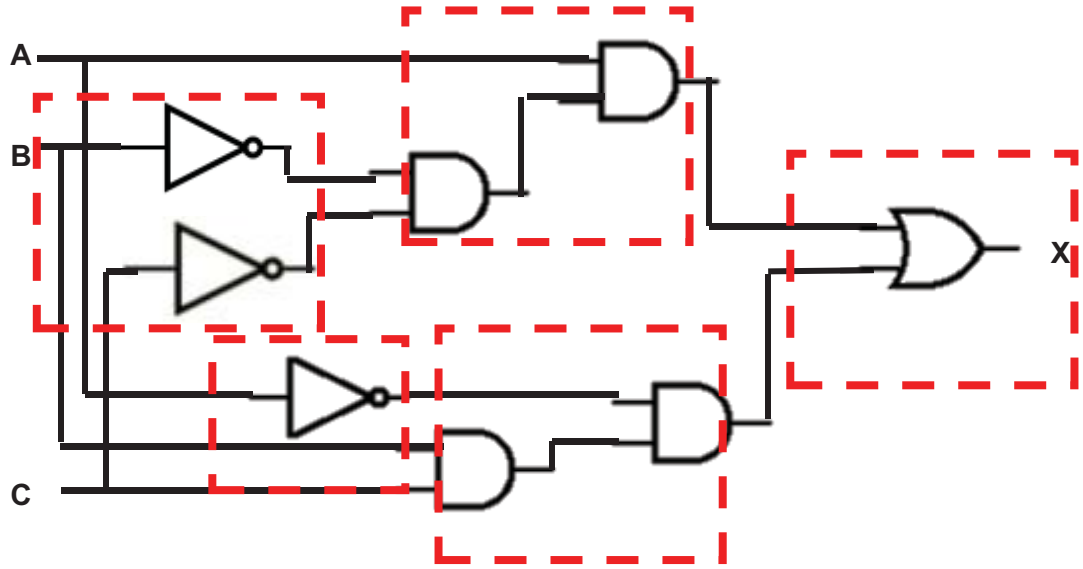
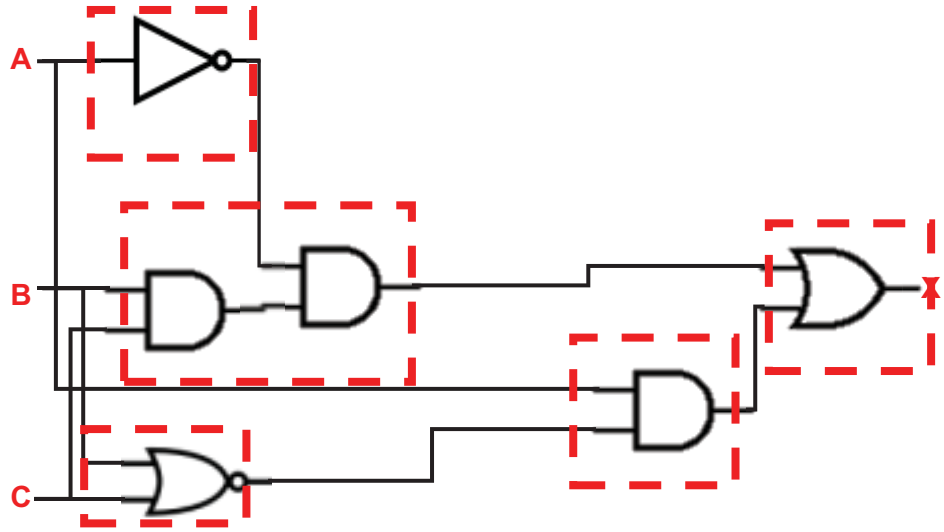
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Question	Answer	Marks
11	Alice • Assembler • translates low level language into machine code / only option for low-level language programs Akbar • Interpreter • easy to identify where an error is / to debug a program Alex • Compiler • once translated a stand-alone program file is created / no need for the compiler when running the program	**6**

Question	Answer	Marks
12(a)	1 mark for appropriate use and 1 mark for suitable example for up to three uses e.g. • HTML colours • e.g. blue `0000FF` • Display machine code/programs/memory dump • e.g. `5F 3A 09 F1` • Display (MAC) addresses • e.g. `01-23-45-67-89-AB-CD` • Display ASCII/Unicode values • e.g. `%41` for A • Display error codes • e.g. error #404 page not found	**6**
12(b)	Any **two** from: • easier for programmers to read and understand • easier to find errors • conversion to binary easier than denary to binary • more can be displayed on a screen for addresses etc. // smaller display screens can be used • faster than binary for entering numbers	**2**

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Question	Answer	Marks
13(a)	Primary storage – main memory inside a computer /directly accessed by CPU Example – ROM / RAM Secondary storage – non-volatile/persistant memory that is accessed by a device that is part of a computer system / not directly accessed by the CPU Example – HDD / SSD Off-line storage – non-volatile memory that can be removed from a computer system Example – DVD/ Blu-ray / CD / USB flash memory / removable or external HDD or SSD	**6**
13(b)	• 125 megabytes • CD / low capacity flash memory • good for mailing / inexpensive to buy	**3**

Question	Answer	Marks
14(a)	1 mark for each correct indicated area.  This is one example, many others exist. Alternative example  	**5**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>14(b)</td><td>4 marks for 8 correct bits
3 marks for 6 correct bits
2 marks for 4 correct bits
1 mark for 2 correct bits

<table>
<tr><th>A</th><th>B</th><th>C</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td></tr>
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