Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/12**

Paper 1 **March 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.

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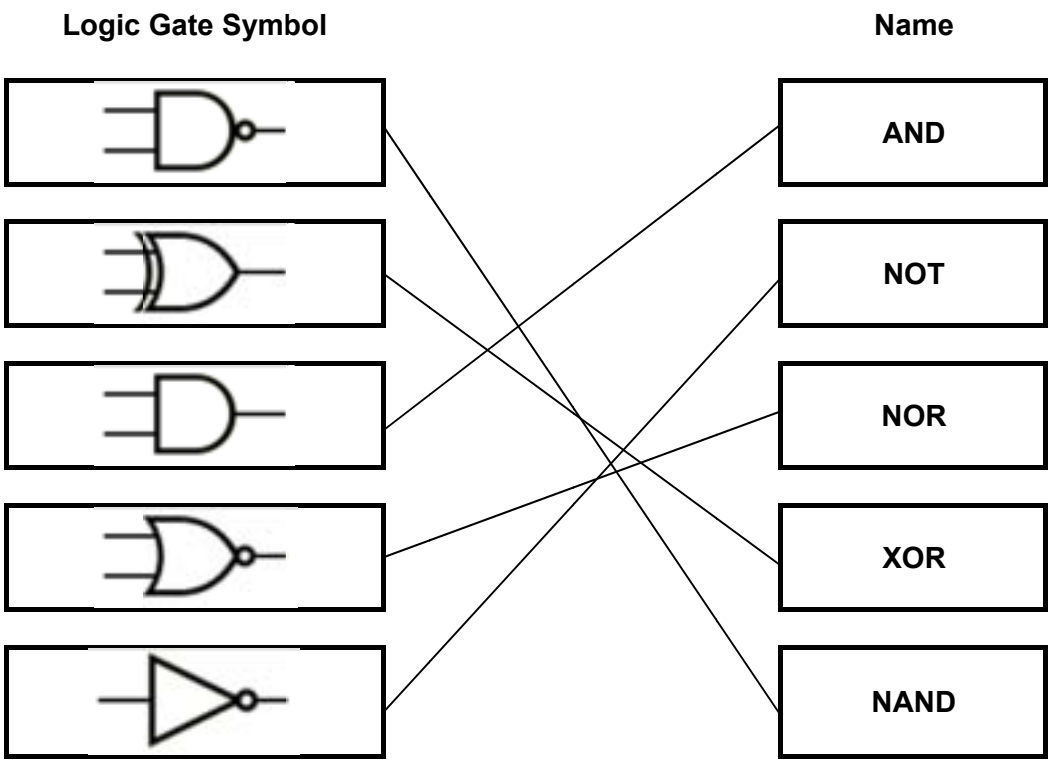
Question	Answer	Marks
1	Any **three** from: • light • temperature • gas • magnetic field • pressure • moisture • humidity • pH • motion	**3**

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)	**v w x y z a b c d e f g h i j k l m n o p q r s t u** **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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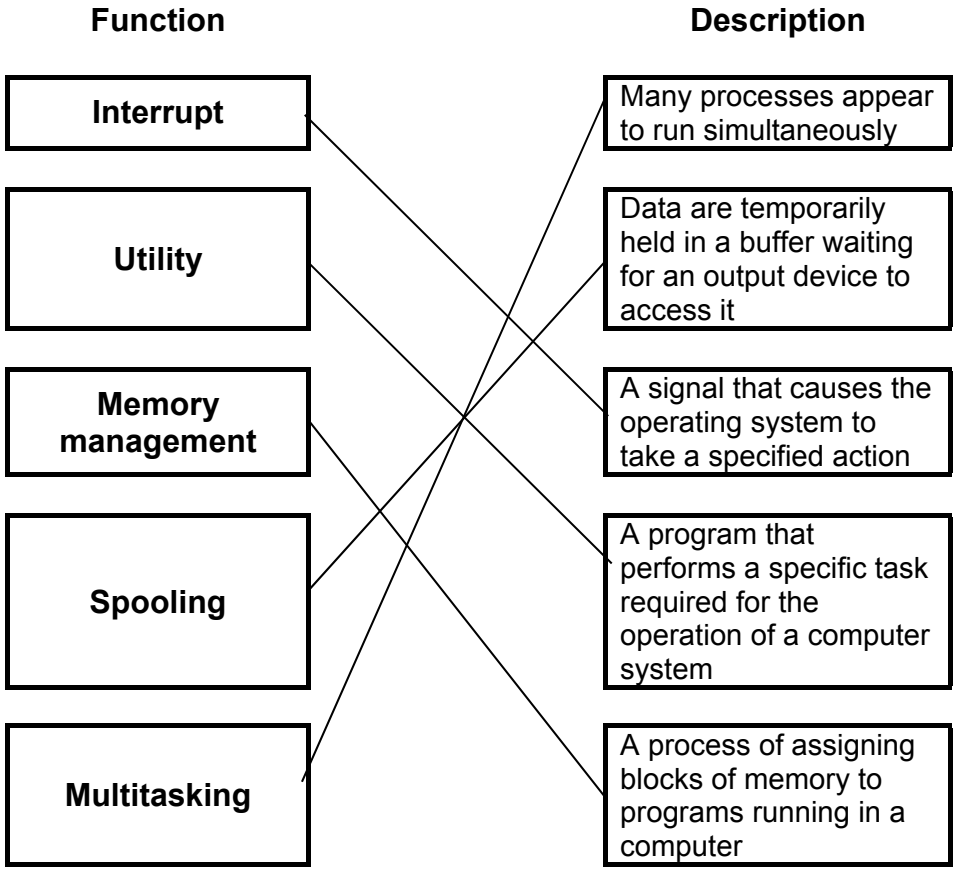
Question	Answer	Marks
6	1 mark for each correctly drawn line from a function to its description to a maximum of 4  	**4**

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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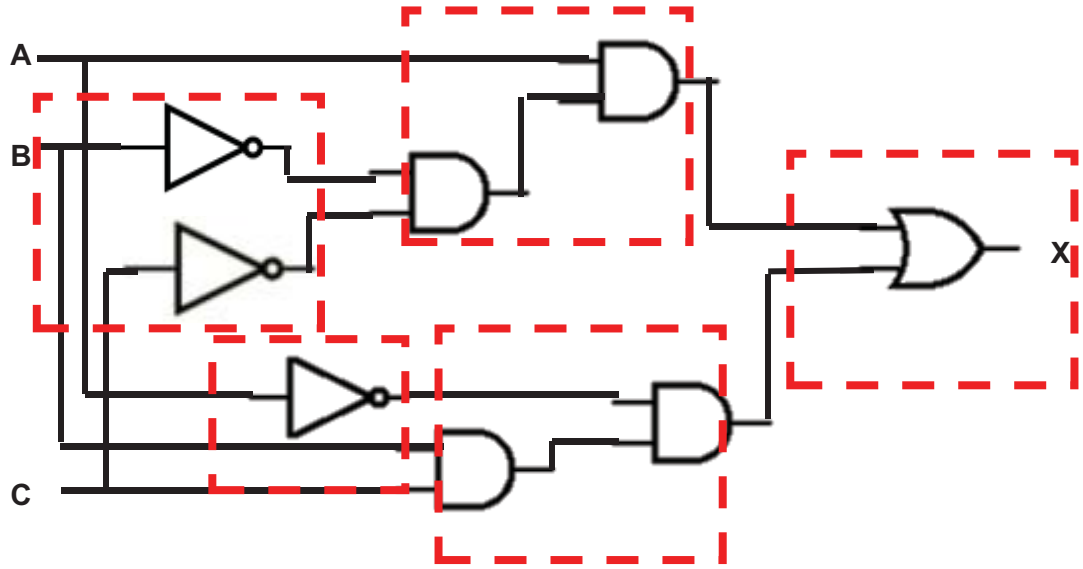
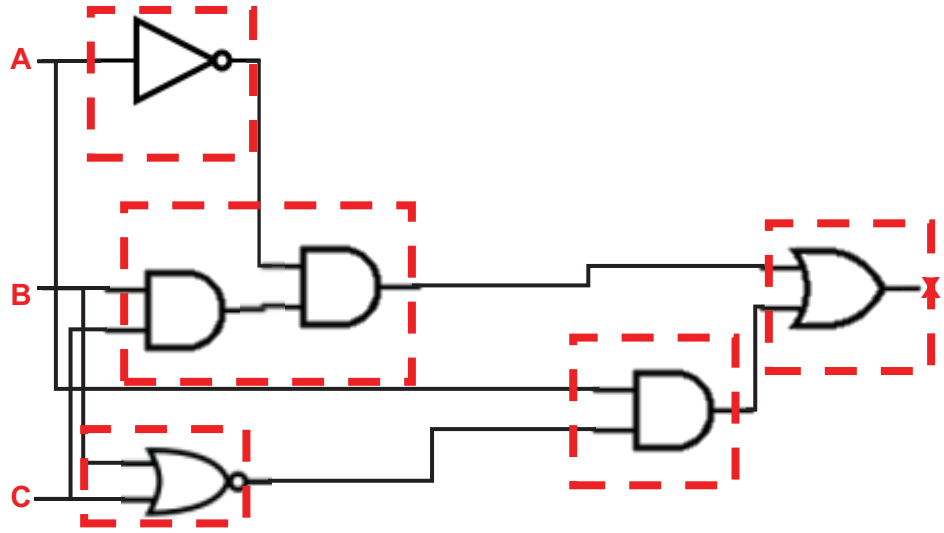
Question	Answer	Marks
13(a)	Primary storage – main memory inside a computer /directly accessed by CPU Example – ROM / RAM Secondary storage – non-volatile/persistant memory that is accessed by a device that is part of a computer system / not directly accessed by the CPU Example – HDD / SSD Off-line storage – 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

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