Mark Scheme – 2020 Sec 4E Computing Prelim Paper 1
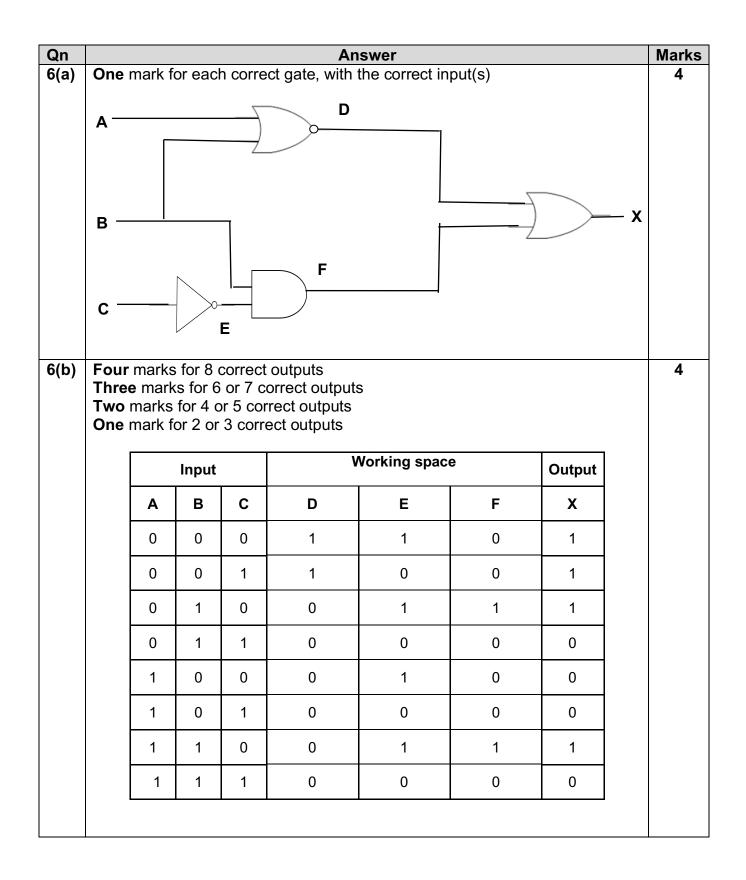
Qn	Answer	Marks
1(a)	**One** mark for each correct answer <table><tr><th>Application</th><th>Storage Medium</th></tr><tr><td>Storage of a text book in electronic form</td><td>CD-ROM</td></tr><tr><td>Storage of photographs in a mobile phone</td><td>flash memory</td></tr><tr><td>A offline backup of a complete PC file system</td><td>external hard disk</td></tr><tr><td>Storage of operating system and applications software</td><td>internal hard disk</td></tr><tr><td>Playback of video files</td><td>DVD</td></tr></table>	5
1(b)	**(i)** flash memory card	1
1(b)	**(ii)** Any **two** from: • faster access time than magnetic or optical external storage • not vulnerable to drops, mechanical shocks, scratches or fingerprints • more robust / no moving parts • physically small and lighter in weight • low energy consumption • low heat generation	2

Qn	Answer	Marks
2	**One** mark for each correct line, each box must have only **one** connection.	6

Network term

| Wired network |
| Wireless network |
| Bridge |
| Router |
| Network Interface Card (NIC) |
| Wide area network (WAN) |

Description

| A component that receives and forwards data packets using IP addressing |
| A combination of computers and components that are only connected using cables |
| An internal component that allows a computer to connect to a network |
| A combination of computers and components that are only connected using radio waves |
| A combination of computing devices covering a large-scale geographical area |
| A component that joins similar networks together |

Qn	Answer	Marks
3(a)	**One** mark for each correct 8-bit binary number	3

67	0	1	0	0	0	0	1	1

65	0	1	0	0	0	0	0	1

82	0	1	0	1	0	0	1	0

Qn	Answer	Marks
3(b)	**One** mark for each correct hexadecimal number	3

0101 0000   **50**

0100 0101   **45**

0100 1110   **4E**

Qn	Answer	Marks
4	**One** mark for each correct point	6

Inputs   200 books' titles

200 corresponding number of copies of books sold

Outputs   Title of the best-selling book

Corresponding number of copies sold

Processes   Store the data in lists

Search for the book with the greatest number sold

Qn	Answer	Marks
5	The technique of **<u>decomposition</u>** is a method of breaking down a complex problem or process into **<u>smaller</u>** parts such that each part is more manageable and easier to understand. The technique of **<u>pattern recognition</u>** is a method of identifying **<u>similarities</u>** among two or more items. The technique of **<u>generalisation</u>** is a method of replacing two or more similar items with a single, more common item.	**5**

Qn	Answer	Marks
6(a)	**One** mark for each correct gate, with the correct input(s)	4

Qn	Answer	Marks
6(b)	**Four** marks for 8 correct outputs **Three** marks for 6 or 7 correct outputs **Two** marks for 4 or 5 correct outputs **One** mark for 2 or 3 correct outputs	4

Input			Working space			Output
A	B	C	D	E	F	X
0	0	0	1	1	0	1
0	0	1	1	0	0	1
0	1	0	0	1	1	1
0	1	1	0	0	0	0
1	0	0	0	1	0	0
1	0	1	0	0	0	0
1	1	0	0	1	1	1
1	1	1	0	0	0	0

Qn	Answer	Marks
7	**One** mark for each correct error and corresponding correction **Error 1** `Outside_Range = 1` **Correction** `Outside_Range = `**`0`** **Error 2** `IF number >= 5 OR number <= 25 THEN` **Correction** `IF number >= 5 `**`AND`**` number <= 25 THEN` **Error 3** `Outside_Range = Outside_Range - 1` **Correction** `Outside_Range = Outside_Range `**`+`**` 1` **Error 4** `Count = Count + 1` **Correction** **`(Not needed, remove this line)`**	8

Qn	Answer	Marks
8(a)	**One** mark for each correct definition and **one** mark for each corresponding explanation of the threat they pose **<u>Spywares</u>** <u>Definition</u>: A hidden program that secretly collects personal information about its users and transmits this information to attackers without the users' knowledge. <u>Threat</u>: The personal information can be used to hack into a user's accounts. **<u>Trojan horses</u>** <u>Definition</u>: A computer program that pretends to be a harmless file or useful application. <u>Threat</u>: Once a Trojan horse is run, it does something harmful such as giving intruders unauthorised access to the computer instead.	4
8(b)(i)	**One** mark for any correct answer from: Cookies, Pharming, Phishing, Spamming, Virus, Worm	1
8(b)(ii)	**One** mark for each correct answer from: 1) Install Anti-Virus and Anti-Spyware Programs 2) Update Software Regularly 3) Do not click on dubious links in emails 4) Be careful of fake websites	1

Qn	Answer	Marks

9(a)	**One** mark for each correct answer
	
	Social impact (any one from)
	  1) Technology has provided better videos, simulations and collaboration tools for lessons to be more engaging and relevant to students
	  2) The open sharing of information on the Internet has made education accessible to all, even learners from disadvantaged backgrounds.
	
	Economic impact (any one from)
	  1) The rise of open courseware has led to a large number of for-profit and non-profit organisations that offer customised lessons on a variety of topics for self-study online.
	  2) Many educational institutions have also invested heavily in the materials and infrastructure needed to conduct lessons over the Internet.
	  3) Some traditional educators find that they need to retrain and pick up new skills to better utilise these new technologies for education.
		2

9(b)(i)	**One** mark for any correct answer (or any other reasonable answers):
	
	  1) Plan a schedule for studying and relaxation time
	  2) Get someone to help monitor your device usage
	  3) Set phone control settings that can limit device usage time
		1

9(b)(ii)	**One** mark for each correct answer (or any other reasonable answers):
	
	  1) Technology has made it more challenging for educators as students' attention spans are getting shorter due to the technology and social media that they are used to today
	  2) Some people use the Internet to reinforce their existing opinions or to spread rumours and misinformation which may lead to conflict in school
	  3) Technology can break down and cause disruptions in learning
		2

Qn	Answer	Marks
10(a)(i)	**One** mark for each correct column. All necessary numbers present and in correct order 	Number1	Number2	Number	Output
---	---	---	---
6			
	4		
		2	
			2		4
10(a)(ii)	To calculate the absolute difference between one pair of numbers	1

10(b)(i)	**One** mark for any correct answer from:
	   1) Range check
	   2) Presence check
	   3) Format check
		1

10(b)(ii)	**One** mark for each correct answer set (or any other reasonable answers): Test case condition: Error condition Test data: a, b	2

Qn	Answer	Marks
11(a)	**One** mark for each correct answer A1 - text B3 - number D2 - date	**3**
11(b)(i)	**PMT**	**1**
11(b)(ii)	**SUM**	**1**
11(b)(iii)	**COUNT or COUNTA**	**1**

Qn	Answer	Marks

12	**Sample program in pseudocode:**
	
	largest = 0, shop1 = 0, shop2 = 0
	for item = 1 **to** 100
	    input price1, price2
	    if price1 > price2 **then** shop1 = shop1 + 1
	    if price2 > price1 **then** shop2 = shop2 + 1
	    difference = price1 – price2
	        if difference < 0 **then** difference = - difference
	        if difference > largest **then** largest = difference
	next item
	output shop1, shop2, largest	