Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

COMPUTER SCIENCE **9608/32**

Paper 3 Written Paper **May/June 2017**

MARK SCHEME

Maximum Mark: 75

Published

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Question	Answer	Marks
1(a)(i)	`DECLARE NewFriend : MyContactDetail`	**1**
1(a)(ii)	`NewFriend.HouseNumber ← 129`	**1**

1(b)	Declaration of `Name`, `Area`, `HouseNumber` 1
	Inclusion of three correct values for `Area` 1
	Inclusion of correct range for `HouseNumber` 1
	
	For example:
	
	`TYPE MyContactDetail`
	`  DECLARE Name : STRING`
	`  DECLARE Area : (uptown, downtown, midtown)` **1**
	`  DECLARE HouseNumber : 1..499` **1 & 1**
	`ENDTYPE`
		3

1(c)(i)	4402	**1**
1(c)(ii)	33	**1**
1(c)(iii)	3427	**1**
1(c)(iv)	`TRUE`	**1**
1(d)(i)	`IPointer ← @MyInt2`	**1**
1(d)(ii)	`MyInt1 ← 33`	**1**
1(d)(iii)	`IPointer^ ← MyInt2`	**1**

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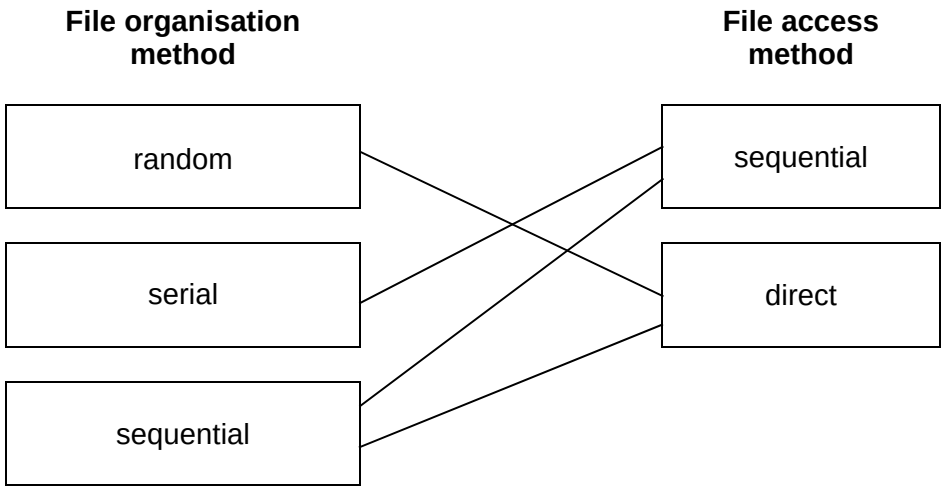
Question	Answer	Marks
2(a)(i)	Pharming	**1**
2(a)(ii)	Phishing	**1**
2(a)(iii)	A standalone/independent piece of malicious software 1 that can replicate/duplicate itself 1	**2**
2(b)	No up-to-date anti-virus (or equivalent) software (used) / Regular virus scans not performed No firewall Operating system not up-to-date/obsolete Attachments/suspicious links in emails clicked on Clicking on website with an out of date security certificate **max 2**	**2**
2(c)(i)	(Certificate) serial number 1 Certificate Authority (that issued certificate) 1 Valid date(s) // Date of expiry 1 Subject name (name of user/owner, computer, network device) 1 Subject public key 1 Version (Number) 1 Hashing algorithm (data or signature) 1 **max 3**	**3**
2(c)(ii)	CA uses hashing algorithm .. 1 To generate a message digest from the particular certificate 1 Message digest is encrypted with CA's private key 1	**3**
2(c)(iii)	Need to know that the certificate is genuine (and has not been altered) // Authenticate or verify it (came from the CA)	**1**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3(a)</td><td>$S = (\overline{P} + (\overline{Q+R}))$. R
$\overline{P}$ 1
$(\overline{Q+R})$ 1
$(\overline{P}+(\overline{Q+R}))$ 1
. R (must be outside final brackets) 1

Or

$\overline{P}$ 1
$(\overline{Q+R})$ 1
$\overline{P}+(\overline{Q+R})$ 1
(…….). R 1</td><td>4</td></tr>
<tr><td>3(b)</td><td><table><tr><th>P</th><th>Q</th><th>R</th><th>Working space</th><th>S</th></tr><tr><td>0</td><td>0</td><td>0</td><td></td><td>0</td></tr><tr><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td><td></td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td></td><td>1</td></tr><tr><td>1</td><td>0</td><td>0</td><td></td><td>0</td></tr><tr><td>1</td><td>0</td><td>1</td><td></td><td>0</td></tr><tr><td>1</td><td>1</td><td>0</td><td></td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td><td></td><td>0</td></tr></table>2 marks all correct, 1 mark seven correct, 0 marks six or fewer correct</td><td>2</td></tr>
<tr><td>3(c)(i)</td><td>PQ
<table><tr><th></th><th>00</th><th>01</th><th>11</th><th>10</th></tr><tr><td>R 0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr></table></td><td>1</td></tr>
<tr><td>3(c)(ii)</td><td>PQ
<table><tr><th></th><th>00</th><th>01</th><th>11</th><th>10</th></tr><tr><td>R 0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr></table></td><td>1</td></tr>
<tr><td>3(c)(iii)</td><td>$S = \overline{P}$. R</td><td>1</td></tr>
</table>

Question	Answer	Marks
3(d)	$S = (\overline{P} + (\overline{Q+R})) . R$ $S = (\overline{P} + (\overline{Q} . \overline{R})) . R$ // $\overline{P} . R + (\overline{Q+R}) . R$ 1 $S = (\overline{P} . R) + (\overline{Q} . \overline{R} . R)$ 1 $S = \overline{P} . R + \overline{Q} . 0$) $S = \overline{P} . R + 0$) 1 $S = \overline{P} . R$	**3**

Question	Answer	Marks
4(a)	 1 mark for random correct 1 mark for serial correct 2 marks for sequential correct (1 per correct line)	**4**
4(b)(i)	File A: Serial 1 Meter readings are submitted over time // added to the end of file 1 Stored chronologically 1	**3**
4(b)(ii)	File B: Sequential 1 Any two points from: Each customer has a unique account number 1 Sorted on Account number 1 High hit rate // Suitable for batch processing monthly statements 1	**3**
4(b)(iii)	File C: Random 1 Login without waiting // Random organisation allows fastest direct access to required record 1 Low hit rate // Suitable for access to individual records 1	**3**

Question	Answer	Marks
5(a)	Option 1 / Option 2 Application Layer / Application Layer **Transport** / **Transport (Layer)** 1 **Internet** / **Network (Layer)** 1 **Network Interface** / **(Data) Link (Layer)** 1	**3**
5(b)(i)	Peer-to-peer	**1**
5(b)(ii)	File sharing	**1**
5(b)(iii)	Any four points from the following: • Torrent descriptor file is made available • File to be shared is split into pieces • BitTorrent client software made available to other peers / users / computers Allowing them to work as seeds or leeches. A peer can act as a 'seed' – used to upload pieces of a file Peer downloading file can get pieces from different seeds simultaneously • Once a peer has a piece of the file it can become a seed for the parts downloaded Leeches download much more than they upload • Central server called a tracker keeps records of all the peers ('swarm') and the parts of the file they have Can pause and restart at any time.	**Max 4**
5(c)	Any two protocols from: HTTP/HTTPS … 1 Used for transfer of web pages from server to client 1 FTP … 1 Used for interactive file transfer 1 SMTP … 1 Used for sending email messages 1 POP3 … 1 Used for incoming email messages 1	**Max 4**

Question	Answer	Marks
6(a)(i)	Monitoring system	**1**
6(a)(ii)	There is no element of 'control' in the system // the system does not alter conditions in the building if sensors triggered	**1**
6(a)(iii)	Any two sensors from: Sound / acoustic Pressure Infra-red / motion /proximity Temperature / Thermal Light Smoke Tilt	**Max 2**

6(b)(i)	`01 ForEver ← FALSE //TRUE` 1
	`02 REPEAT`
	`03 FOR FloorCounter ← 1 TO NoOfFloors`
	`04 FOR SensorCounter ← 1 TO NumberOfSensors` 1
	`05 READ Sensor(SensorCounter)on Floor(FloorCounter)`
	`06 IF Sensor value outside range`
	`07 THEN`
	`08 OUTPUT "Problem on Floor ", FloorCounter`
	`09 ENDIF`
	`10 ENDFOR`
	`11 ENDFOR`
	`12 //`
	`13 // Delay loop`
	`14 // Delay loop`
	`15 //`
	`16 UNTIL ForEver/Forever = TRUE // NOT ForEver / ForEver = FALSE` **1**
		3

6(b)(ii)	`FOR Counter ← 1 TO 999999` (any "large" number) `ENDFOR`	**1**
6(b)(iii)	To allow time to elapse between readings	**1**
6(c)(i)	To identify which sensor caused the interrupt	**1**
6(c)(ii)	Display appropriate warning message 1 On the correct monitor 1	**2**