
COMPUTER SCIENCE

9608/32

Paper 3 Written Paper

May/June 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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This document consists of **7** printed pages.

Question	Answer	Marks
1(a)(i)	DECLARE NewFriend : MyContactDetail	1
1(a)(ii)	NewFriend.HouseNumber ← 129	1
1(b)	<p>Declaration of Name, Area, HouseNumber 1</p> <p>Inclusion of three correct values for Area 1</p> <p>Inclusion of correct range for HouseNumber 1</p> <p>For example:</p> <pre> TYPE MyContactDetail DECLARE Name : STRING DECLARE Area : (uptown, downtown, midtown) DECLARE HouseNumber : 1..499 ENDTYPE </pre> <p style="text-align: right;">1 1 & 1</p>	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

Question	Answer	Marks
2(a)(i)	Pharming	1
2(a)(ii)	Phishing	1
2(a)(iii)	A <u>standalone/independent</u> piece of malicious software that can replicate/duplicate itself	1 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(c)(i)	(Certificate) serial number Certificate Authority (that issued certificate) Valid date(s) // Date of expiry Subject name (name of user/owner, computer, network device) Subject public key Version (Number) Hashing algorithm (data or signature)	1 1 1 1 1 1 1 max 3
2(c)(ii)	CA uses hashing algorithm .. To generate a message digest from the particular certificate Message digest is encrypted with CA's private key	1 1 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

Question	Answer	Marks																																																						
3(a)	$S = (\bar{P} + (\overline{Q+R})) \cdot R$ \bar{P} $(\overline{Q+R})$ $(\bar{P} + (\overline{Q+R}))$ $\cdot R \quad (\text{must be outside final brackets})$ <p>Or</p> \bar{P} $(\overline{Q+R})$ $\bar{P} + (\overline{Q+R})$ $(\dots\dots\dots) \cdot R$	<p style="text-align: right;">4</p> <p style="text-align: right;">1 1 1 1 1 1 1 1</p>																																																						
3(b)	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 10%;">P</th> <th style="width: 10%;">Q</th> <th style="width: 10%;">R</th> <th style="width: 40%;">Working space</th> <th style="width: 10%;">S</th> </tr> </thead> <tbody> <tr><td></td><td>0</td><td>0</td><td>0</td><td></td><td>0</td></tr> <tr><td></td><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr> <tr><td></td><td>0</td><td>1</td><td>0</td><td></td><td>0</td></tr> <tr><td></td><td>0</td><td>1</td><td>1</td><td></td><td>1</td></tr> <tr><td></td><td>1</td><td>0</td><td>0</td><td></td><td>0</td></tr> <tr><td></td><td>1</td><td>0</td><td>1</td><td></td><td>0</td></tr> <tr><td></td><td>1</td><td>1</td><td>0</td><td></td><td>0</td></tr> <tr><td></td><td>1</td><td>1</td><td>1</td><td></td><td>0</td></tr> </tbody> </table> <p>2 marks all correct, 1 mark seven correct, 0 marks six or fewer correct</p>		P	Q	R	Working space	S		0	0	0		0		0	0	1		1		0	1	0		0		0	1	1		1		1	0	0		0		1	0	1		0		1	1	0		0		1	1	1		0	<p style="text-align: right;">2</p>
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3(c)(i)	<p style="text-align: center;">PQ</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <tr> <td></td> <td></td> <td>00</td> <td>01</td> <td>11</td> <td>10</td> </tr> <tr> <td rowspan="2" style="vertical-align: middle;">R</td> <td>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>			00	01	11	10	R	0	0	0	0	0	1	1	1	0	0	<p style="text-align: right;">1</p>																																					
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3(c)(iii)	$S = \bar{P} \cdot R$	<p style="text-align: right;">1</p>																																																						

Question	Answer	Marks
3(d)	$S = (\bar{P} + (\overline{Q+R})) \cdot R$ $S = (\bar{P} + (\overline{Q \cdot R})) \cdot R // \bar{P} \cdot R + (\overline{Q+R}) \cdot R$ $S = (\bar{P} \cdot R) + (\overline{Q \cdot R} \cdot R)$ $S = \bar{P} \cdot R + \overline{Q} \cdot 0$ $S = \bar{P} \cdot R + 0$ $S = \bar{P} \cdot R$	<p>3</p> <p>1</p> <p>1</p> <p>)</p> <p>) 1</p>

Question	Answer	Marks												
4(a)	<table border="0" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">File organisation method</td> <td style="width: 10%;"></td> <td style="width: 40%;">File access method</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">random</td> <td style="border: none;">\</td> <td style="border: 1px solid black; padding: 5px;">sequential</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">serial</td> <td style="border: none;">/</td> <td style="border: 1px solid black; padding: 5px;">direct</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">sequential</td> <td style="border: none;">/</td> <td style="border: 1px solid black; padding: 5px;">direct</td> </tr> </table> <p>1 mark for random correct 1 mark for serial correct 2 marks for sequential correct (1 per correct line)</p>	File organisation method		File access method	random	\	sequential	serial	/	direct	sequential	/	direct	4
File organisation method		File access method												
random	\	sequential												
serial	/	direct												
sequential	/	direct												
4(b)(i)	File A: Serial Meter readings are submitted over time // added to the end of file Stored chronologically	<p>3</p> <p>1</p> <p>1</p> <p>1</p>												
4(b)(ii)	File B: Sequential Any two points from: Each customer has a unique account number Sorted on Account number High hit rate // Suitable for batch processing monthly statements	<p>3</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>												
4(b)(iii)	File C: Random Login without waiting // Random organisation allows fastest direct access to required record Low hit rate // Suitable for access to individual records	<p>3</p> <p>1</p> <p>1</p> <p>1</p>												

Question	Answer	Marks																
5(a)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Option 1</th> <th style="width: 50%;">Option 2</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Application Layer</td> <td style="text-align: center;">Application Layer</td> <td></td> </tr> <tr> <td style="text-align: center;">Transport</td> <td style="text-align: center;">Transport (Layer)</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">Internet</td> <td style="text-align: center;">Network (Layer)</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">Network Interface</td> <td style="text-align: center;">(Data) Link (Layer)</td> <td style="text-align: center;">1</td> </tr> </tbody> </table>	Option 1	Option 2		Application Layer	Application Layer		Transport	Transport (Layer)	1	Internet	Network (Layer)	1	Network Interface	(Data) Link (Layer)	1	3	
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Application Layer	Application Layer																	
Transport	Transport (Layer)	1																
Internet	Network (Layer)	1																
Network Interface	(Data) Link (Layer)	1																
5(b)(i)	Peer-to-peer	1																
5(b)(ii)	File sharing	1																
5(b)(iii)	<p>Any four points from the following:</p> <ul style="list-style-type: none"> • 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)	<p>Any two protocols from:</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 80%;">HTTP/HTTPS ...</td> <td style="width: 20%; text-align: right;">1</td> </tr> <tr> <td>Used for transfer of web pages from server to client</td> <td style="text-align: right;">1</td> </tr> <tr> <td>FTP ...</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Used for interactive file transfer</td> <td style="text-align: right;">1</td> </tr> <tr> <td>SMTP ...</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Used for sending email messages</td> <td style="text-align: right;">1</td> </tr> <tr> <td>POP3 ...</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Used for incoming email messages</td> <td style="text-align: right;">1</td> </tr> </tbody> </table>	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
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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)	<pre> 01 ForEver ← FALSE //TRUE 02 REPEAT 03 FOR FloorCounter ← 1 TO NoOfFloors 04 FOR SensorCounter ← 1 TO NumberOfSensors 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 </pre>	<p>1</p> <p>1</p> <p>1</p> <p>3</p>
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 <u>sensor</u> caused the interrupt	1
6(c)(ii)	Display appropriate warning message On the correct monitor	1 1