
COMPUTER SCIENCE**9608/13**

Paper 1 Written Paper

October/November 2017

MARK SCHEME

Maximum Mark: 75

Published

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This document consists of **7** printed pages.

Question	Answer	Marks								
1(a)(i)	119	1								
1(a)(ii)	-120	1								
1(a)(iii)	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>1</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td> </tr> </table>	1	1	1	0	1	1	1	1	1
1	1	1	0	1	1	1	1			
1(a)(iv)	Lowest value: -128 Highest value: +127	1								
1(b)(i)	0110 0101 0011	1								
1(b)(ii)	The second block of four binary digits represents a digit larger than 9 // 14	1								
1(b)(iii)	A string of digits on any electronic device displaying numeric values	1								

Question	Answer	Marks
2(a)		4
2(b)(i)	<p>One mark from:</p> <ul style="list-style-type: none"> The program code can be translated to run on any processor / platform Source code is translated into machine independent intermediate code not machine dependent code 	1

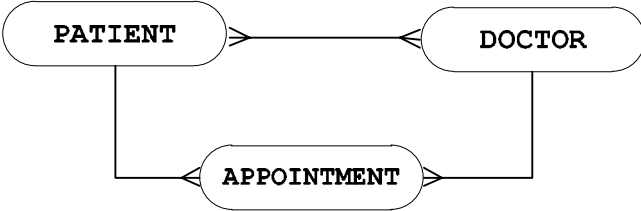
Question	Answer	Marks
2(b)(ii)	<p>Two marks from:</p> <ul style="list-style-type: none"> • Java uses a two-step translation process • Java code is partially interpreted – partially compiled • Code is translated first into intermediate code / "bytecode"... • ...using the Java compiler • The bytecode is finally interpreted by the Java Virtual Machine 	Max 2

Question	Answer	Marks																																													
3(a)	<p>Two marks from:</p> <ul style="list-style-type: none"> • Physical measures • Access rights • Encryption • Firewall • Use authentication methods such as usernames and passwords • Anti-malware program 	Max 2																																													
3(b)(i)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr><td>7</td><td>X</td><td>6</td><td>=</td><td>42</td></tr> <tr><td>8</td><td>X</td><td>5</td><td>=</td><td>40</td></tr> <tr><td>6</td><td>X</td><td>4</td><td>=</td><td>24</td></tr> <tr><td>5</td><td>X</td><td>3</td><td>=</td><td>15</td></tr> <tr><td>3</td><td>X</td><td>2</td><td>=</td><td>6</td></tr> <tr><td>1</td><td>X</td><td>1</td><td>=</td><td>1</td></tr> <tr><td></td><td></td><td></td><td>Total:</td><td>128 / 11</td></tr> <tr><td></td><td></td><td></td><td></td><td>11 R 7</td></tr> <tr><td></td><td></td><td></td><td>Check digit:</td><td>11 – 7 = 4</td></tr> </tbody> </table> <p style="margin-left: 20px;">1 mark for 6 values</p> <p style="margin-left: 20px;">1 mark for 2 steps Accept 128 MOD 11 = 7</p> <p style="margin-left: 20px;">1 mark for subtraction</p> <p>Answer: 786531 4 (1 mark for answer)</p>	7	X	6	=	42	8	X	5	=	40	6	X	4	=	24	5	X	3	=	15	3	X	2	=	6	1	X	1	=	1				Total:	128 / 11					11 R 7				Check digit:	11 – 7 = 4	4
7	X	6	=	42																																											
8	X	5	=	40																																											
6	X	4	=	24																																											
5	X	3	=	15																																											
3	X	2	=	6																																											
1	X	1	=	1																																											
			Total:	128 / 11																																											
				11 R 7																																											
			Check digit:	11 – 7 = 4																																											
3(b)(ii)	<p>One mark for name of check One mark for description Max two checks</p> <p>Uniqueness check Each PatientID must be unique</p> <p>Length check Each PatientID is exactly 7 characters</p> <p>Format check / Type check All 7 characters must be <u>digits</u></p> <p>Presence check PatientID must be entered</p>	Max 4																																													

Question	Answer	Marks																														
4(a)	A – System clock B – Control unit C – Main memory E – Control bus F – Data bus	5																														
4(b)	<table border="1" data-bbox="256 450 959 958"> <thead> <tr> <th>ACC</th> <th>CountDown</th> <th>OUTPUT</th> </tr> </thead> <tbody> <tr> <td></td> <td>15</td> <td></td> </tr> <tr> <td>67</td> <td></td> <td>C</td> </tr> <tr> <td>15</td> <td></td> <td></td> </tr> <tr> <td>14</td> <td>14</td> <td></td> </tr> <tr> <td>51</td> <td></td> <td>3</td> </tr> <tr> <td>14</td> <td></td> <td></td> </tr> <tr> <td>13</td> <td>13</td> <td></td> </tr> <tr> <td>32</td> <td></td> <td></td> </tr> <tr> <td>88</td> <td></td> <td>X</td> </tr> </tbody> </table> <p data-bbox="975 656 1145 902"> (1) (1) + (1) (1) (1) </p>	ACC	CountDown	OUTPUT		15		67		C	15			14	14		51		3	14			13	13		32			88		X	5
ACC	CountDown	OUTPUT																														
	15																															
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15																																
14	14																															
51		3																														
14																																
13	13																															
32																																
88		X																														
4(c)	<p data-bbox="256 994 512 1025">Three marks from:</p> <ul data-bbox="256 1066 1289 1272" style="list-style-type: none"> • The assembler scans the assembly language instructions in sequence • When it meets a symbolic address checks to see if already in symbol table • If not, it adds it to the symbol table in the symbolic address column • If it is already in symbol table check if absolute address known • If the absolute address is known, it is entered in the appropriate cell • If the absolute address is not known mark / leave as unknown 	Max 3																														
4(d)(i)	The op code / mnemonic / instruction table	1																														
4(d)(ii)	<p data-bbox="256 1373 778 1458"> A – 1110 0110 0110 1000 (1) (1) </p> <p data-bbox="256 1507 517 1547"> B – E6 68 (1) </p>	3																														

Question	Answer	Marks
5(a)(i)	<p>Three marks from:</p> <ul style="list-style-type: none"> • Diaphragm / cone • (Voice) coil of wire • Spider / Suspension • (Permanent) Magnet • Basket • Dust cap • Outer frame 	3
5(a)(ii)	<p>Four marks from:</p> <ul style="list-style-type: none"> • Takes an electrical signal and translates it into physical vibrations to create sound waves • An electric current in the coil creates an electro-magnetic field • Changes in the audio signal causes the direction of the electric current to change • The direction of the current determines the polarity of the electro-magnet // changing the direction of the current changes the direction of the polarity of the electro-magnet • The electro-magnet is repelled by or attracted to the permanent magnet • Causing the coil to vibrate • The movement of the coil causes the cone / diaphragm to vibrate • That vibration is transmitted to the air in front of the cone / diaphragm as sound waves • The amount of movement will determine the frequency and amplitude of the sound wave produced 	Max 4
5(b)(i)	<p>One mark from:</p> <ul style="list-style-type: none"> • External hard disk drive // SSD • External CD / DVD drive • Pen drive • Blu-ray drive 	1
5(b)(ii)	<p>Two marks from:</p> <ul style="list-style-type: none"> • Additional secondary file storage // storing files • Backup of files • Archiving of files • Transfer files to second computer 	Max 2

Question	Answer	Marks
6(a)	<p>Two marks from:</p> <ul style="list-style-type: none"> • A system of moral principles • That guide behaviour / decision making • Based on philosophical / religious views • By example, e.g. respectful and considerate behaviour 	Max 2
6(b)	<p>One mark for identifying the issue One mark for correct principle One mark for possible action Max 2 issues (2 × 3 marks)</p> <p>1 Uncomfortable with one of his colleagues Client and Employer // Management / Colleagues // Judgement // Self For example: Team building exercises // arranged meeting</p> <p>2 Unfamiliar with programming language Self // Client and Employer //Product // Profession // Colleagues For example: Undergo training</p> <p>3 Visit to unfamiliar workplace Client and employer // Management // Judgement // Profession // Colleagues For example: He should speak to his manager to discuss situation</p>	Max 6

Question	Answer	Marks
7(a)(i)	<p><u>PatientID</u> } (1) <u>DoctorID</u> }</p> <p><u>AppointmentDate, AppointmentTime</u> (1)</p>	2
7(a)(ii)	 <p>One PATIENT attends many APPOINTMENTs One DOCTOR takes many APPOINTMENTs</p> <p>Special case for 1 mark only (only if no one to many relationships shown) Many PATIENTs are seen by many DOCTORs</p>	2

Question	Answer	Marks
7(b)	Two marks from: Either: <ul style="list-style-type: none"> • Add an attribute (for example Attended) • To the appointment table // APPOINTMENT Or: <ul style="list-style-type: none"> • Add an attribute (for example AppointmentsMissed) • To the patient table // PATIENT 	2
7(c)(i)	Available to work at both SITE-A and SITE-B	1
7(c)(ii)	APPOINTMENT(Site, AppointmentDate, AppointmentTime, DoctorID, PatientID)	1
7(d)(i)	One mark per line UPDATE DOCTOR SET DoctorID = '017' WHERE DoctorID = '117';	3
7(d)(ii)	1 Mark per bullet, max 2 <ul style="list-style-type: none"> • Referential integrity should be maintained // Referential integrity could be violated. • Data becomes inconsistent • There may be records in the APPOINTMENT table showing doctor ID 117 • The APPOINTMENT table might not be automatically updated • Records in the APPOINTMENT table will become orphaned 	Max 2
7(e)	One mark per line SELECT AppointmentDate, AppointmentTime FROM APPOINTMENT WHERE PatientID = '556';	3