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Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

COMPUTER SCIENCE **9608/13**

Paper 1 Written Paper **October/November 2017**

MARK SCHEME

Maximum Mark: 75

Published

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Question	Answer	Marks
1(a)(i)	119	1
1(a)(ii)	–120	1
1(a)(iii)	1 1 1 0 1 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)	A web page contains a client-side script → Interpreter Each instruction in the source code consists of an op code and an operand → Assembler The source code is required at run-time → Interpreter When the source code is translated, copies of the executable program can be distributed without the need for the source code → Compiler	4
2(b)(i)	**One mark** from: 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

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Question	Answer	Marks
2(b)(ii)	**Two marks** from: 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)	**Two marks** from: Physical measures Access rights Encryption Firewall Use authentication methods such as usernames and passwords Anti-malware program	**Max 2**
3(b)(i)	<table><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 colspan="4">Check digit:</td><td>11 – 7 = 4</td></tr></table> 1 mark for 6 values 1 mark for 2 steps Accept 128 MOD 11 = 7 1 mark for subtraction Answer: 786531 4 (1 mark for answer)	**4**
3(b)(ii)	**One mark** for name of check **One mark** for description **Max two** checks Uniqueness check Each `PatientID` must be unique Length check Each `PatientID` is exactly 7 characters Format check / Type check All 7 characters must be <u>digits</u> Presence check `PatientID` must be entered	**Max 4**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4(a)</td><td>A – System clock
B – Control unit
C – Main memory
E – Control bus
F – Data bus</td><td>5</td></tr>
<tr><td>4(b)</td><td>
<table>
<tr><th>ACC</th><th>CountDown</th><th>OUTPUT</th><th></th></tr>
<tr><td></td><td>15</td><td></td><td></td></tr>
<tr><td>67</td><td></td><td>C</td><td></td></tr>
<tr><td>15</td><td></td><td></td><td></td></tr>
<tr><td>14</td><td>14</td><td></td><td>(1)</td></tr>
<tr><td>51</td><td></td><td>3</td><td>(1) + (1)</td></tr>
<tr><td>14</td><td></td><td></td><td>(1)</td></tr>
<tr><td>13</td><td>13</td><td></td><td rowspan="3">(1)</td></tr>
<tr><td>32</td><td></td><td></td></tr>
<tr><td>88</td><td></td><td>X</td></tr>
</table>
</td><td>5</td></tr>
<tr><td>4(c)</td><td>Three marks from:

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</td><td>Max 3</td></tr>
<tr><td>4(d)(i)</td><td>The op code / mnemonic / instruction table</td><td>1</td></tr>
<tr><td>4(d)(ii)</td><td>A – 1110 0110 0110 1000
(1) (1)

B – E6 68 (1)</td><td>3</td></tr>
</table>

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Question	Answer	Marks
5(a)(i)	**Three marks** from: Diaphragm / cone (Voice) coil of wire Spider / Suspension (Permanent) Magnet Basket Dust cap Outer frame	**3**
5(a)(ii)	**Four marks** from: 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)	**One mark** from: External hard disk drive // SSD External CD / DVD drive Pen drive Blu-ray drive	**1**
5(b)(ii)	**Two marks** from: Additional secondary file storage // storing files Backup of files Archiving of files Transfer files to second computer	**Max 2**

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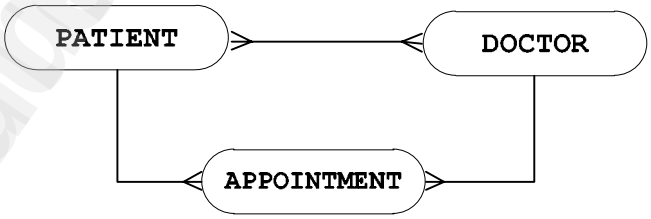
Question	Answer	Marks
6(a)	**Two marks** from: A system of moral principles That guide behaviour / decision making Based on philosophical / religious views By example, e.g. respectful and considerate behaviour	**Max 2**
6(b)	**One mark** for identifying the issue **One mark** for correct principle **One mark** for possible action **Max 2** issues (2 × 3 marks) 1 Uncomfortable with one of his colleagues Client and Employer // Management / Colleagues // Judgement // Self For example: Team building exercises // arranged meeting 2 Unfamiliar with programming language Self // Client and Employer //Product // Profession // Colleagues For example: Undergo training 3 Visit to unfamiliar workplace Client and employer // Management // Judgement // Profession // Colleagues For example: He should speak to his manager to discuss situation	**Max 6**

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

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Question	Answer	Marks
7(b)	**Two marks** from: Either: Add an attribute (for example `Attended`) To the appointment table // `APPOINTMENT` Or: 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 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

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