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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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

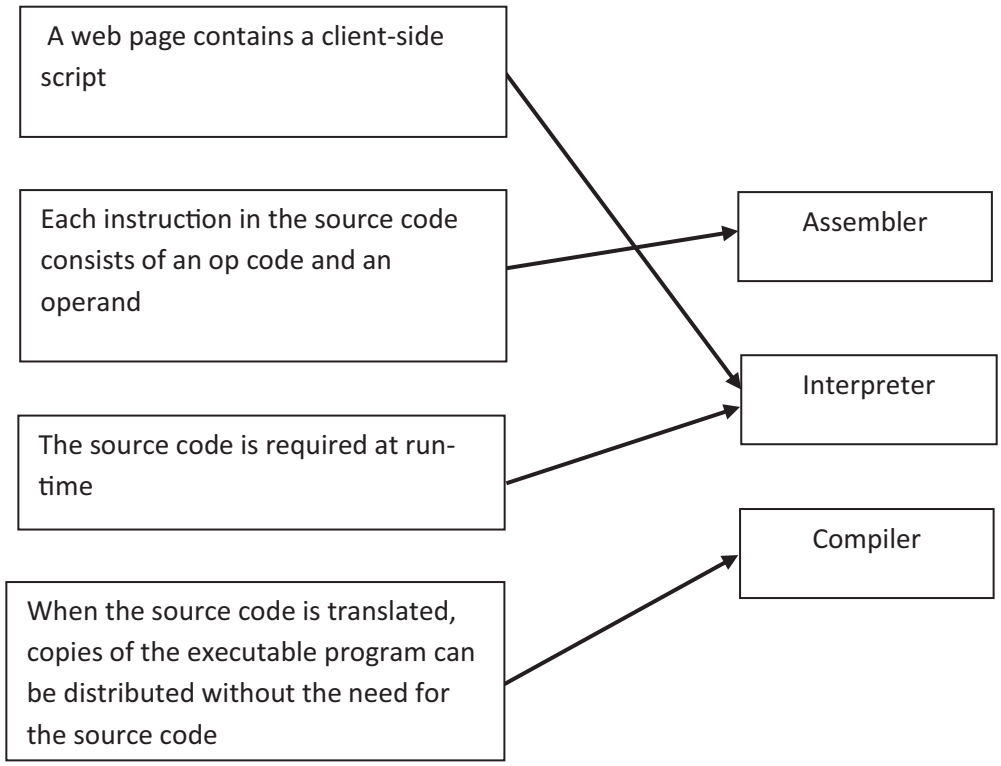
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Question	Answer	Marks
1(a)(i)	119	**1**
1(a)(ii)	–120	**1**
1(a)(iii)	1 1 1 0 1 1 1 1	**1**
1(a)(iv)	Lowest value: −128 Highest value: +127	**1**
1(b)(i)	0110 0101 0011	**1**
1(b)(ii)	The second block of four binary digits represents a digit larger than 9 // 14	**1**
1(b)(iii)	A string of digits on any electronic device displaying numeric values	**1**

Question	Answer	Marks
2(a)		**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**

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)	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 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 digits Presence check `PatientID` must be entered	**Max 4**

<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></tr>
<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>
</table>
(1)
(1) + (1)
(1)
(1)
</td><td>5</td></tr>
<tr><td>4(c)</td><td>Three marks from:

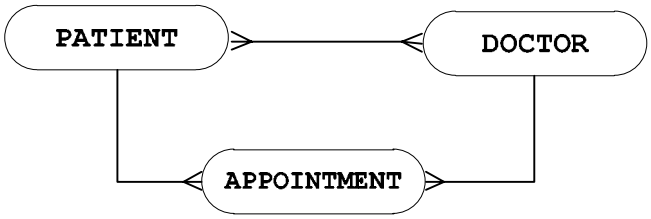
• The assembler scans the assembly language instructions in sequence
• When it meets a symbolic address checks to see if already in symbol table
• If not, it adds it to the symbol table in the symbolic address column
• If it is already in symbol table check if absolute address known
• If the absolute 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>

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**

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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