
COMPUTER SCIENCE

9608/11

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 |

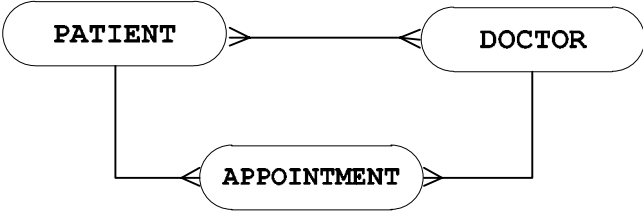
| Question | Answer | Marks |
|----------|---|--------------|
| 2(b)(ii) | <p>Two marks from:</p> <ul style="list-style-type: none"> • Java uses a two-step translation process • Java code is partially interpreted – partially compiled • Code is translated first into intermediate code / "bytecode"... • ...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-bottom: 10px;"> <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>1 mark for 6 values</p> <p>1 mark for 2 steps Accept 128 MOD 11 = 7</p> <p>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" style="display: inline-table; vertical-align: top;"> <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> <div style="display: inline-block; vertical-align: middle; margin-left: 20px;"> <p>(1)</p> <p>(1) + (1)</p> <p>(1)</p> <p>(1)</p> </div> | ACC | CountDown | OUTPUT | | 15 | | 67 | | C | 15 | | | 14 | 14 | | 51 | | 3 | 14 | | | 13 | 13 | | 32 | | | 88 | | x | 5 |
| ACC | CountDown | OUTPUT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | | C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4(c) | <p>Three marks from:</p> <ul 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>A – 1110 0110 0110 1000 (1) (1)</p> <p>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) | <p>Two marks from:</p> <p>Either:</p> <ul style="list-style-type: none"> • Add an attribute (for example <code>Attended</code>) • To the appointment table // <code>APPOINTMENT</code> <p>Or:</p> <ul style="list-style-type: none"> • Add an attribute (for example <code>AppointmentsMissed</code>) • To the patient table // <code>PATIENT</code> | 2 |
| 7(c)(i) | Available to work at both <code>SITE-A</code> and <code>SITE-B</code> | 1 |
| 7(c)(ii) | <code>APPOINTMENT(Site, AppointmentDate, AppointmentTime, DoctorID, PatientID)</code> | 1 |
| 7(d)(i) | <p>One mark per line</p> <pre>UPDATE DOCTOR SET DoctorID = '017' WHERE DoctorID = '117';</pre> | 3 |
| 7(d)(ii) | <p>1 Mark per bullet, max 2</p> <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 <code>APPOINTMENT</code> table showing doctor ID 117 • The <code>APPOINTMENT</code> table might not be automatically updated • Records in the <code>APPOINTMENT</code> table will become orphaned | Max 2 |
| 7(e) | <p>One mark per line</p> <pre>SELECT AppointmentDate, AppointmentTime FROM APPOINTMENT WHERE PatientID = '556';</pre> | 3 |