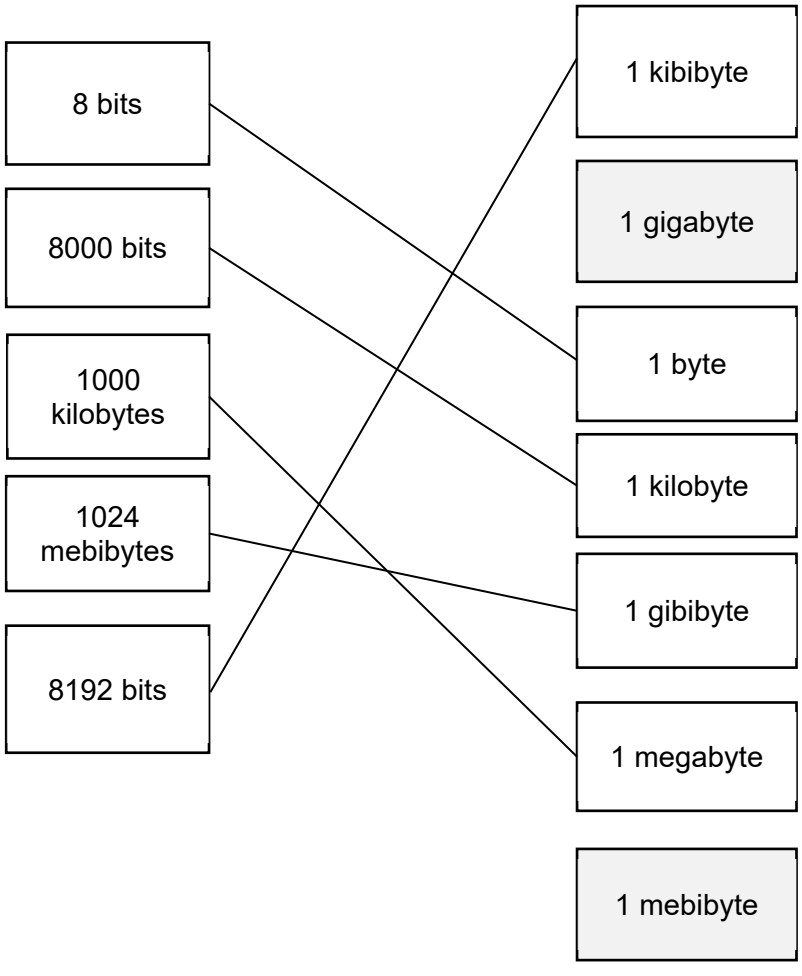
Question	Answer	Marks
1(a)	**1 mark** for each correct line  	**5**
1(b)(i)	**1 mark** for answer **1 mark** for working e.g. 1010 1010 0011 0111 **1110 0001** 1 1 1 1 1 1 1	**2**
1(b)(ii)	The result is a larger number than can be stored in the given number of bits. // The result is greater than 255	**1**
1(c)	240	**1**

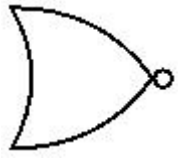
Question	Answer	Marks
2(a)	**1 mark** per bullet point • security is protecting data from loss / corruption • integrity is ensuring the consistency / accuracy of the data	**2**
2(b)(i)	**1 mark** per bullet point • validation checks that data is reasonable / sensible • example e.g. checking data is the right number / type of characters	**2**
2(b)(ii)	**1 mark** per bullet point • verification checks that data is the same as the original • by example e.g. double entry	**2**
2(c)	**1 mark** per similarity to **max 2** • Both are pieces of malicious software • Both are downloaded / installed/run without the user's knowledge • Both can pretend to be / are embedded in other legitimate software when downloaded // both try to avoid the firewall • Both run in the background **1 mark** for difference • Virus can damage computer data; spyware only records / accesses data • Virus does not send data out of the computer; spyware sends recorded data to third party • Virus replicates itself; spyware does not replicate itself	**3**

Question	Answer	Marks
3(a)	**1 mark** per bullet point • A AND B … • … XOR C … • … OR NOT B ((A AND B) XOR C) OR NOT B	**3**

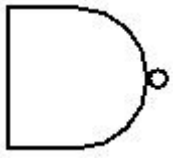
<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3(b)</td><td>1 mark for each set of 4 rows (shaded)

<table>
<tr><th>A</th><th>B</th><th>C</th><th>Working space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td></td><td>0</td></tr>
</table></td><td>2</td></tr>
<tr><td>3(c)</td><td>1 mark for gate, 1 mark for matching symbol, 1 mark for matching truth table

NOR

<table>
<tr><th>A</th><th>B</th><th>OUTPUT</th></tr>
<tr><td>0</td><td>0</td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>0</td></tr>
</table>
NAND

<table>
<tr><th>A</th><th>B</th><th>OUTPUT</th></tr>
<tr><td>0</td><td>0</td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td></tr>
</table></td><td>3</td></tr>
</table>

Question	Answer	Marks
4(a)	**1 mark** per bullet point to **max 3** e.g. • He has ethical guidelines to follow • … so clients/other staff know the standards being applied • … so he does not have to decide what is ethical it's written down • Clients / staff know he is reputable • … recognition of his skills / knowledge • … there may be a test / requirements for entry • They provide help and support • … for example if he needs legal advice • They run training courses • … to keep his skills up-to-date	**3**
4(b)(i)	**1 mark** per bullet point to **max 2** e.g. • He can tell the manager he has not used it • … and how he will get up-to-date • He can perform his own research on how to use it • He can explain to the manager that he needs additional training • He can(ask the manager to book on a training course • He can ask for a mentor / to shadow someone • He can practice at home before starting	**2**
4(b)(ii)	**1 mark** for each correct tool e.g. • Colour coding // pretty printing • Auto-complete • Auto-correct • Context sensitive prompts • Expand and collapse code blocks	**3**
4(c)	**1 mark** per bullet point to **max 2** e.g. • He didn’t act in best interest of product • … because the product might fail because he didn’t report the error • He didn’t act in best interest of client • … because if the product does not work then they have been let down because he didn't report the error • He didn’t act in the best interest of the profession • … he is letting his profession down because he didn't report the error • He didn’t act in best interest of the company • ... not correcting the error early could lead to later problems	**2**

Question	Answer	Marks
4(d)	**1 mark** for each correctly completed term **Compilers** are usually used when a high-level language program is complete. They translate all the code at the same time and then run the program. They produce **executable/.exe/object code** files that can be run without the source code. **Interpreters** translate one line of a high-level language program at a time, and then run that line of code. They are most useful while developing the programs because errors can be corrected and then the program continues from that line. Assemblers are used to translate assembly code into **binary/machine code**.	**4**

Question	Answer	Marks
5(a)	**1 mark** for 2 or 3 correct ticks, **2 marks** for 4 correct ticks **Table** | **Field name** | **Primary Key (PK)** | **Foreign Key (FK)** MANAGER | ManagerID | ✓ | SHOP | ManagerID | | ✓ CAR | RegistrationNumber | ✓ | CAR | ShopID | | ✓	**2**
5(b)	**1 mark** per bullet point • Access rights give managers / himself access to different elements • … by having different accounts / logins • … which have different access rights e.g. read only // no access / read / write • Specific views can be assigned to himself and to the managers • … e.g. managers can only see the data for their own shop(s)	**3**

5(c)(i)	**1 mark** per correctly completed statement
	
	`SELECT COUNT(RegistrationNumber)`
	`FROM CAR`
	`GROUP BY ShopID`
		3

5(c)(ii)	**1 mark** for each correct statement
	
	`INSERT INTO CAR`
	`VALUES ("123AA","Tiger","Lioness",10500,"12BSTREET")`
		2

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)</td><td>1 mark for identification of line and description of error
1 mark for the correct statement

<table>
<tr><th>Line number</th><th>Description of the error</th><th>Correct statement</th></tr>
<tr><td>2</td><td>Program Counter should be incremented, not decremented</td><td>PC ← [PC] + 1</td></tr>
<tr><td>3</td><td>It should be the contents of the address in the MAR</td><td>MDR ← [[MAR]]</td></tr>
</table></td><td>4</td></tr>
<tr><td>6(b)</td><td>1 mark for each correct row

<table>
<tr><th>Current contents of the ACC</th><th>Instruction</th><th>New contents of the ACC</th></tr>
<tr><td>11111111</td><td>OR 101</td><td>11111111</td></tr>
<tr><td>00000000</td><td>XOR #15</td><td>00001111</td></tr>
<tr><td>10101010</td><td>LSR #2</td><td>00101010</td></tr>
<tr><td>01010101</td><td>AND 104</td><td>00000000</td></tr>
</table></td><td>4</td></tr>
</table>

Question	Answer	Marks
7(a)(i)	**1 mark** per bullet point • Smaller time gaps between the samples • Makes the **digital** sound **wave** more accurate • Smaller quantisation errors	**2**
7(a)(ii)	**1 mark** per bullet point • More samples/data are taken/recorded • … so more bits are stored altogether	**2**
7(b)(i)	**1 mark** per bullet point • Reduces the file size • Faster to transmit/download • Original file is too large for email storage/attachment	**2**
7(b)(ii)	**1 mark** per bullet point to **max 2** e.g. • Reduce amplitude to only the range used • … limited amplitudes mean fewer bits per sample • Run-length-encoding • … Where consecutive sounds are the same record the binary value of the sound and number of times it repeats • Record the changes instead of the actual sounds	**2**

Question	Answer	Marks
8(a)	**1 mark** per bullet point • LAN • Small geographical area • No leasing external infrastructure / transmission media // does not use internet to transmit within the building	**3**
8(b)	**1 mark** per item • router • switch • hub	**2**
8(c)	**1 mark** per bullet point to **max 4** • Provide interface to wireless network • … as an antenna • Receives analogue radio waves • … convert them to digital / binary • Checks incoming transmissions for correct MAC / IP address • … ignore transmissions not intended for it • Encrypts / encodes the data • Decrypts / decodes the data • Takes digital/binary input and converts to analogue waves • … sends the radio waves via the antenna	**4**