

2	One mark for each correct line <table> <tr> <th>Description</th><th>Programming Technique</th></tr> <tr> <td>adding a set of numbers</td><td>output</td></tr> <tr> <td>displaying the result of a calculation</td><td>selection</td></tr> <tr> <td>executing a set of instructions based on a condition</td><td>totalling</td></tr> <tr> <td>executing the same set of instructions multiple times</td><td>iteration</td></tr> <tr> <td></td><td>counting</td></tr> </table>	Description	Programming Technique	adding a set of numbers	output	displaying the result of a calculation	selection	executing a set of instructions based on a condition	totalling	executing the same set of instructions multiple times	iteration		counting
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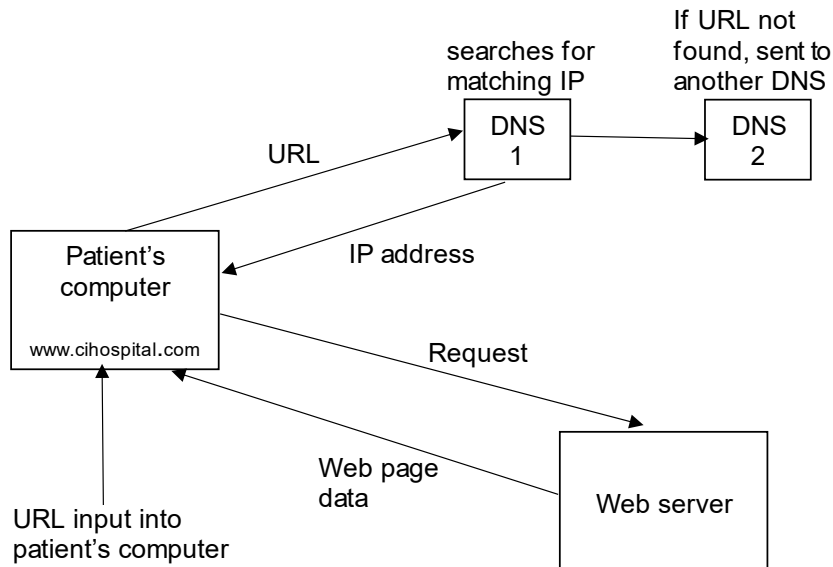
1(a)	Any one from: - ROM - Cache
1(b)	Any one from: - It is volatile storage // Data is lost when the power is turned off. - It needs to be regularly replaced by other data // The data regularly changes // Data needs to be constantly updated
1(c)	10011 11100110
1(d)	0011 0101 1000 1010 1101
1(e)	One mark for each correct nibble (MAX 2) One mark for a correct method of working e.g. showing carries. <pre> 1 1 0 1 1 0 0 1 0 1 + 0 1 1 1 0 0 0 0 ----- 1 1 0 1 0 1 0 1 </pre>
1(f)	Any two from: - The result is greater than 255 // The result is too large. - Cannot be stored in 8 bits // Cannot be stored in the number of bits available for the register
1(g)	One mark for a correct working method e.g. flip and add One mark for correct answer 11101010

5(a)	Three from: • The <u>inference</u> engine is used ... • ... to decide which questions to ask the user ... • ... based on the previous data input. • Symptoms input are located in/compared to knowledge base. • ... then applies the rule base to the knowledge base (to decide the diagnosis)
5(b)(i)	Any two from: Examples: • Sensors • Microprocessors • Actuators
5(b)(ii)	Any four from: Examples: • a doctor doesn't need to travel to the hospital to do the surgery. • ... so it can be done by any specialist/doctor in the world. • ... so it can be done immediately without needing to wait for travel time // reduces the waiting time for the patient. • ... so the doctor may be better at the surgery as they won't be tired from travel. • ... so travel costs are saved. • Surgery with robots enhances precision/accuracy. • ... so a smaller incision can be made. • ... so the recovery time may be shorter. • ... as the components used to enter the body can be much smaller than a human hand. • ... so the surgery is safer/ more hygienic // by example e.g. can stop the doctor needing to be near an infectious patient. • The surgery may have a higher rate of success
5(b)(iii)	Two from (one for a point and one for the matching expansion): Examples: • The internet connection could be lost/delayed ... • ... so the surgery may not be able to continue. • The robot will be expensive to buy/maintain ... • ... this money could have been spent on other causes. • The robot could be hacked • ... and endanger the patient's life. • Data could be corrupted in transmission ... • ... changing the nature of the instruction for the robot. • The robot's hardware could malfunction ... • ... so the surgery cannot continue

5(c)(i) **One** mark for each correct part of the diagram.

The diagram:

- Web browser identified as software used to **send** URL/requests or **receives** IP address/web page data
- URL/domain sent to DNS
- DNS **searches** for **matching** IP address
- If not found sent to another DNS
- IP address sent from DNS to patient's computer
- Request sent from patient's computer to **web server** (for web page)
- Web page/HTML data sent from web server to patient's computer



5(c)(ii) Any **six** from:

- Encrypted connection established ...
- ... using asymmetric encryption
- ... to make any data sent meaningless
- The **web browser** asks the **web server** to identify itself.
- ... by sending its digital certificate.
- The digital certificate is authenticated/validated by the **web browser**.
- If the certificate is authenticated/valid, the connection is secure/the transaction can begin.
- If the certificate is not authenticated/invalid, the connection is not secure/the transaction is cancelled/rejected/user is notified

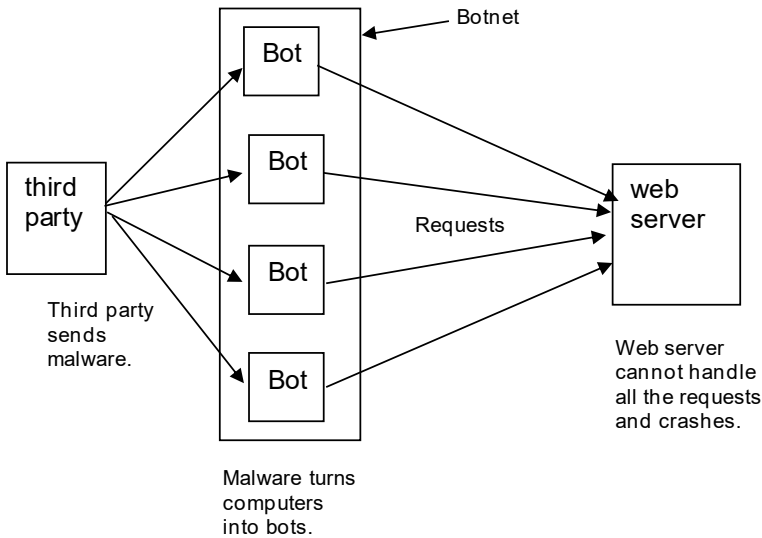
5(a) Any **two** from:

- **storing** a database of URLs and matching IP addresses
- **search** its database for the matching IP address.
- send the URL to another DNS **if URL cannot be found**.
- return the IP address to the web browser

5(b) D

- 5(c)(i) **One** mark for each part of the diagram that shows:
- A perpetrator/third party sending malware // user downloads/install malware
 - Each computer is turned into a bot ...
 - ... to create a botnet.
 - Third party initiates the attack.
 - **All** the bots send a request at once to the web server.
 - ... crashing the web server.

Example:



- 5(c)(ii)
- Hide a public IP address
 - Caching

5(d)(i) B

5(d)(ii) Any **three** from:

Examples:

- Store user's login details.
- Store user's payment details.
- Store user's preferences.
- Use for targeted advertising.

5(d)(iii) Any **two** from:

Examples:

- Storing bookmarks/favourites
- Recording user history
- Allowing use of multiple tabs
- Providing navigation tools
- Providing an address bar

1(a)	B
1(b)(i)	• Lossy • Lossless
1(b)(ii)	Any three from: • The file requires less storage space • Takes less time to transmit • A lower bandwidth can be used to transmit the file • Less data usage for data allowance • More likely to meet file size limits set by email clients/apps

2(a)	One mark for each correct part of the fee, in the correct order: – 17 – 70 (Correct fee \$17.70)
2(b)	One mark for each correct binary value: Register 1 – 00001110 Register 2 – 01100010
2(c)	One mark for each correct hexadecimal value, in the correct order. – A – 0 – 3 – D (Ticket number A03D)
2(d)	Two from: – It contains logic gates/switches ... – ... that process the values 1 and 0 // have two states
2(e)	Any four from: – Compares the ticket number received to stored data – ... that is a database/file of ticket numbers – ... checks the ticket number is listed as paid – If the data matches/cost is paid it sends a signal to raise the barrier – If the data does not match/cost is not paid, the barrier remains down