QUESTION 3.

3 **(a)** The table shows four statements about IP addresses.

Tick (✓) to show which of the statements are true.

Statement	True (✓)
The IP address consists of any number of digits separated by single dots (.)	
Each number in an IP address can range from 0 to 255	
IP addresses are used to ensure that messages and data reach their correct destinations	
Public IP addresses are considered to be more secure than private IP addresses	

[2]

(b) Consider the URL:

http://cie.org.uk/computerscience.html

(i) Give the meaning of the following parts of the URL.

http .....

.....

.....

cie.org.uk .....

.....

.....

computerscience.html .....

.....

.....

[3]

(ii) Sometimes the URL contains the characters **%20** and **?**.

Describe the function of these characters.

%20 .....

.....

? .....

.....

[2]

QUESTION 4.

7 Access to World Wide Web content uses IP addressing.

(a) State what IP stands for.

.....

(b) The following table shows four possible IP addresses.

Indicate for each IP address whether it is valid or invalid and give a reason.

Address	Denary / Hexadecimal	Valid or Invalid	Reason
`3.2A.6AA.BBBB`	Hexadecimal		
`2.0.255.1`	Denary		
`6.0.257.6`	Denary		
`A.78.F4.J8`	Hexadecimal		

[4]

(c) Describe **two** differences between public and private IP addresses.

1 .....

.....

2 .....

.....[2]

QUESTION 5.

6 **(a)** Explain the difference between the World Wide Web (WWW) and the Internet.

.....

.....

.....

.....[2]

(b) Three methods of connecting devices include fibre-optic cables, copper cables and radio waves. The table below gives descriptions relating to these connection methods.

Tick (✓) one box on each row to show the method that best fits each description.

Description	Fibre-optic cable	Copper cable	Radio waves
Wireless medium			
Twisted-pair is an example			
Uses light waves			
WiFi			
Fastest transmission medium			

[5]

(c) Bit streaming is used for both real-time and on-demand services.

Describe **one** difference between real-time and on-demand bit streaming.

.....

.....

.....

.....[2]

(d) A device needs an IP address to connect to the Internet. IPv4 is the more common type of IP address.

Describe, using an example, the format of an IPv4 address.

.....

.....

.....

.....

.....

.....[3]

(e) A computer user keys in the Uniform Resource Locator (URL) of a web p
browser.

Describe how the browser uses the Domain Name Service (DNS) to display the web

.....

.....

.....

.....

.....

.....

.....

.....[4]

QUESTION 6.

7 The design of a web-based application can require the use of client-side scripting.

(a) Describe what is meant by **client-side scripting**.

.....

.....

.....

.....[2]

(b) A user requests a web page by keying the Uniform Resource Locator (URL) into the address bar of their web browser.

The requested page contains a client-side script.

Describe the sequence of steps leading to the display of the web page on the computer screen.

.....

.....

.....

.....

.....

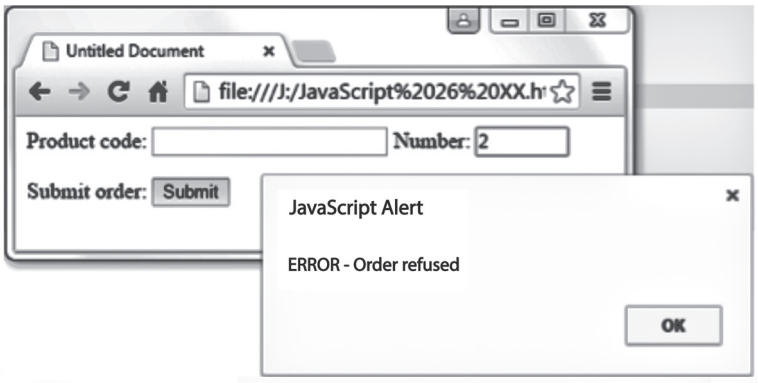
.....

.....

.....[4]

(c) A web page used for data capture consists of:

- two text boxes for the entry of:
  - a product code
  - the number of items to be purchased.
- a button which is clicked when the user wants to submit this order.



Study the following web page.

```
1  <html>
2  <head>
3  <title>Untitled Document</title>
4  <script language="JavaScript">
5
6  function myButton_onmousedown()
7  {
8  var Message1 = "ERROR - Order refused";
9  var Message2 = "Product code OK";
10 var x = document.forms["form1"]["txtProductCode"].value;
11     if (x == "")
12     {
13         alert(Message1)
14     }
15     else
16     {
17         alert(Message2)
18     }
19 }
20 </script>
21
22 </head>
23 <body>
24 <form name = form1>
25   <label>Product code: </label>
26   <input type="text" name="txtProductCode" >
27   <label>Number: </label>
28   <input type="text" name="txtNumber" size = "5" >
29   <p>
30     <label>Submit order: </label>
31     <input type="button" name="btnSubmit" Value = "Submit"
32
33     onMouseDown = "myButton_onmousedown()" >
34   </p>
35 </form>
36
37 </body>
38 </html>
```

(i) The developer has used three variables in the JavaScript code. State the

1 .....

2 .....

3 ..... [2]

(ii) The button has an event whose identifier is `onMouseDown`. When the submit button is clicked, some code is executed.

State the line numbers that contain this code.

From line ..... to line ..... [1]

(iii) The JavaScript code uses a selection statement.

State the line number that contains the condition.

Line number: ..... [1]

(iv) Describe the purpose of the validation check that the code performs.

.....

.....[1]

(v) Name and describe **two** other types of validation check that could be appropriate for this data capture form.

Validation check: .....

Description .....

.....

Validation check: .....

Description .....

.....

[4]

QUESTION 7.

6 Downloading a file from a website is an example of a client-server application.

(a) Describe what is meant by the term **client-server** for this application.

.....

.....

.....

.....[2]

(b) The following sequence of steps (1 to 5) describes what happens when someone uses their personal computer (PC) to request a web page. The web page consists of HTML tags and text content only. Four of the statements from **A**, **B**, **C**, **D**, **E** and **F** are used to complete the sequence.

A	Browser software interprets the script, renders the page and displays.
B	Browser software renders the page and displays.
C	Browser software compiles the script, renders the page and displays.
D	The web server retrieves the page.
E	The Domain Name Service (DNS) uses the domain name from the browser to look up the IP address of the web server.
F	The web server sends the web page content to the browser.

Write one of the letters A to F in the appropriate row to complete the sequence.

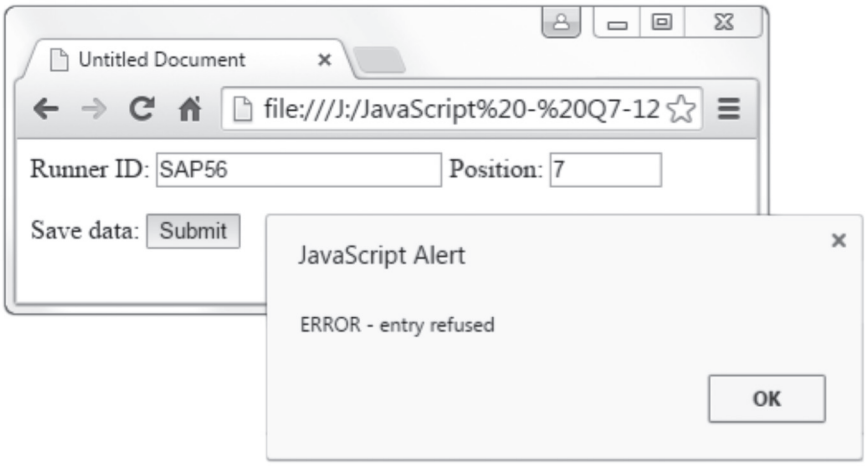
1. The user keys in the Uniform Resource Locator (URL) into the browser software.
2. .....
3. .....
4. .....
5. .....

[4]

Question 6(c) begins on the next page.

(c) The following web page used for data capture consists of:

- two text boxes for the entry of:
  - a race runner's ID code
  - their finishing position in a race.
- a button that the user clicks to submit this runner's result.




```
 <html>
<head>
<title>Untitled Document</title>
<script language="JavaScript">

function myButton_onmousedown()
{
var Output1 = "Runner ID OK";
var Output2 = "ERROR - entry refused";

var Runner ID = document.forms["form1"]["txtRunnerID"].value;
//                                  || in Javascript is the 'OR' operator
if (RunnerID.substr(0,3) == "VAR" || RunnerID.substr(0,3) == "CAM")
{
          alert(Output1)
    }
    else
    {
          alert(Output2)
    }
}
</script>

</head>
<body>
<form name = form1>
  <label>Runner ID: </label>
  <input type="text" name="txtRunnerID" >
  <label>Position: </label>
  <input type="text" name="txtPosition" size = "5" >
  <p>
    <label>Save data: </label>
    <input type="button" name="btnSubmit" Value = "Submit"

    onMouseDown = "myButton_onmousedown()" >
  </p>
</form>

</body>
</html>
```

(i) The developer has used three variables in the JavaScript code. Sta used.

1. .....

2. .....

3. ..... [2]

(ii) The button has an event whose identifier is `onMouseDown`. When the mouse button is clicked, some code is run.

State the line numbers which contain this code.

From line ..... to line ..... [1]

(iii) The JavaScript code uses a selection statement.

State the line number which contains its condition.

Line number: ..... [1]

(iv) Describe the purpose of the validation check that the code performs.

.....

.....[1]

(v) Name and describe **two** other types of validation check which could be appropriate for this data capture form.

Validation check: .....

Description .....

.....

Validation check: .....

Description .....

.....

[4]

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BLANK PAGE

QUESTION 8.

2 Computer **A** needs to access a web page.

(a) State how Computer **A** could access the web page without using a Domain Na
(DNS).

.....

.....[1]

(b) **(i)** The following table shows four IPv6 addresses.

State if each address is valid or invalid.

IP address	Valid or invalid
21E5:69AA:FFFF:1:E100:B691:1285:F56E	
::255.255.255.255	
59FB::1005:CC57:6571	
56FE::2159:5BBC::6594	

[4]

(ii) The following table shows four statements about either public or private IP addresses.

Tick (✓) **one** box in each row to indicate whether each statement refers to a public or a private IP address.

Statement	Public	Private
192.168.2.1 is an example of this type of address		
Assigned by the Internet Service Provider (ISP)		
IP address cannot be duplicated in different networks		
Network Address Translation (NAT) is necessary to access the Internet directly		

[4]

(c) One type of transmission media is copper cable.

Give **two** additional types of transmission media.

1 .....

2 .....

[2]

QUESTION 9.

2 Gopal types the Uniform Resource Locator (URL) of a website into a web browse

(a) The following sequence (1 to 5) describes the steps that take place. There are th statements.

1 Gopal types into the web browser.

2 .....

3 DNS looks up the URL in table

4 .....

5 .....

Three statements **A**, **B** and **C** are used to complete the sequence.

A	DNS finds corresponding IP address
B	Web browser sends URL to Domain Name Service (DNS)
C	DNS returns IP address to web browser

Write one of the letters **A** to **C** in the appropriate rows (2, 4 and 5) to complete the sequence. [2]

(b) Describe the purpose of an IP address.

.....

.....

.....

..... [2]

(c) A telecommunications operator has installed fibre-optic cables in Gopal's neighbourhood.

(i) Give **three** benefits of fibre-optic cable over copper cable.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(ii) Give **two** drawbacks of fibre-optic cable over copper cable.

1 .....

.....

2 .....

.....

[2]

QUESTION 10.

4 Ava needs to view a website and she knows the Uniform Resource Locator (URL)

(a) Complete the series of steps that take place.

Write the **letter** of the appropriate statement in each space.

A	DNS finds corresponding IP
B	DNS looks up URL in table
C	Ava types the URL into a web browser

1 .....

2 Web browser sends URL to Domain Name Service (DNS)

3 .....

4 .....

5 DNS returns IP address to web browser

[2]

(b) **(i)** An IPv4 address has been entered as 12.258.3

Give **two** reasons why this IP address is invalid.

1 .....

.....

2 .....

.....

[2]

(ii) An IPv6 address has been entered as 15EF:5L63::2014:BB::60AA

Give **two** reasons why this IP address is invalid.

1 .....

.....

2 .....

.....

[2]

(c) The table shows four descriptions of IP addresses.

Tick (✓) **one** box in each row to identify whether each description applies to a publi
IP address.

Description	Public	Private
The address can be reached over the Internet.		
The address is more secure.		
The address can only be accessed through the same LAN.		
The address can be duplicated in different networks.		

[4]

QUESTION 11.

1 Devices connected to the Internet have IP (Internet Protocol) addresses.

(a) Three IPv4 addresses are given.

Circle either Valid or Invalid to indicate whether each address is valid or invalid. Explain decision.

Address 1: 3A.21.2H.1 Valid / Invalid

Explanation .....

.....

Address 2: 299.53.2.2 Valid / Invalid

Explanation .....

.....

Address 3: 192.2.1.0 Valid / Invalid

Explanation .....

.....

[3]

(b) A website can be accessed using either the Uniform Resource Locator (URL) or the IP address.

Describe how a URL is converted into its matching IP address.

.....

.....

.....

.....

.....

..... [3]

(c) People use the Internet to stream media.

Complete the following statements by filling in the names of the missing methods of bit streaming.

..... bit streaming is used when watching a live stream of events that are currently taking place. The event is captured live with a video camera connected to a computer, and it cannot be paused or rewound.

..... bit streaming is used when watching an event that has taken place in the past. Existing media are encoded to bit streaming format and uploaded to a server. It can be paused and rewound.

[2]

(d) A recording of a concert is stored as a file. The file is compressed using lo
before it is streamed to users.

(i) State why this file needs to be compressed.

.....

..... [1]

(ii) Define the term **lossy compression**.

.....

..... [1]

(iii) The file could be compressed using lossless compression.

Explain why lossy compression is a more appropriate compression technique than lossless for this file.

.....

.....

.....

.....

.....

..... [3]

QUESTION 12.

1 Computers on the Internet have IP addresses.

(a) IP addresses can be in either IPv4 or IPv6 format.

(i) Give an example of a valid IPv4 address.

.....

..... [1]

(ii) State why there is a need for IPv6 addressing.

.....

..... [1]

(iii) A computer's IPv6 address is:

C100:2235::1000:25AA:AA50

Explain why this IPv6 address would be an invalid IPv4 address.

.....

.....

.....

..... [2]

(b) A company has computers in two separate buildings that communicate using the Internet over a Public Switched Telephone Network (PSTN).

(i) Describe the transmission of data using a PSTN.

.....

.....

.....

..... [2]

(ii) The company wants to install a dedicated line between the two buildings.

Identify **one** benefit and **one** drawback of installing a dedicated line between the two buildings.

Benefit .....

.....

Drawback .....

.....

[2]

(c) A network can use routers and gateways.

Explain the role of routers **and** gateways in a network.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(d) The company has an email server.

Identify **three** other types of server.

1 .....

2 .....

3 .....

[3]