QUESTION 3.

7 **(a)** **(i)** Describe what is meant by a client-server model of networked computer

.....

.....

.....

.....[2]

(ii) Give **two** benefits of using the client-server model.

1 .....

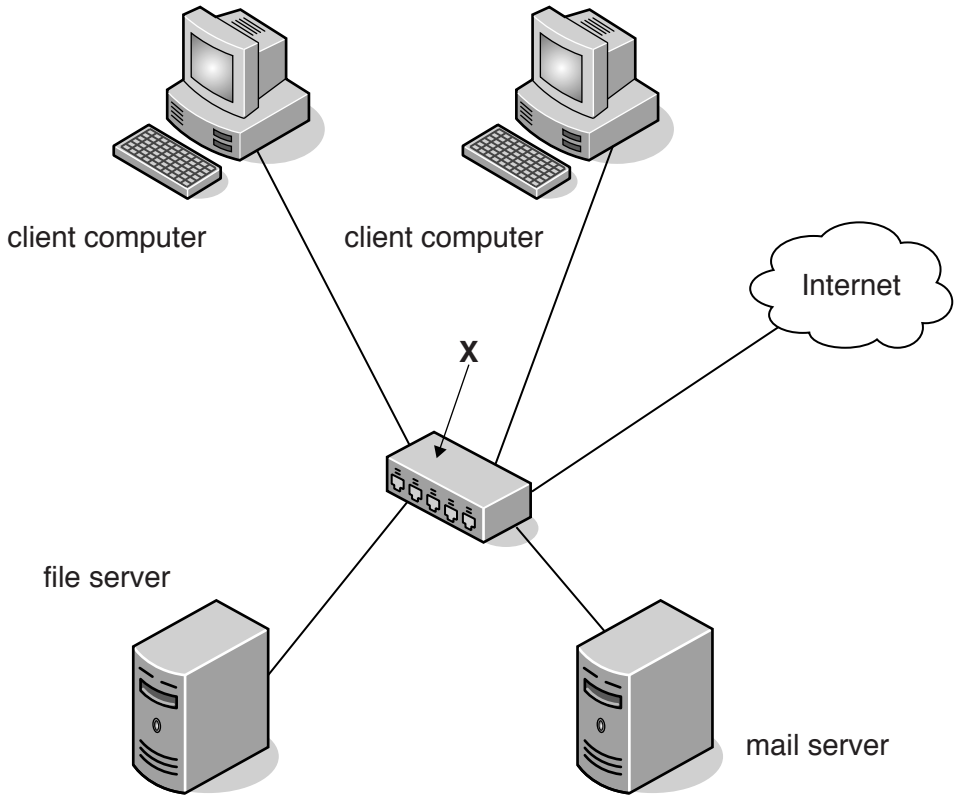
.....

2 .....

.....

[2]

(b) The diagram shows a computer network with connection to the Internet.



Name the hardware device labelled **X**.

.....[1]

(c) A web page offers a link for users to request another web page. The requ
contains HTML code and JavaScript code.

Put each statement in the correct sequence by writing the numbers 1 to 5 in the ri
column.

Statement	Sequence number
The requested web page is displayed on the client computer	
The user clicks on the hyperlink and the web page is requested from the web server	
The requested web page content is transmitted to the client computer	
The client computer processes the JavaScript code using the web browser software	
The web server locates the requested web page	

[5]

QUESTION 4.

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.

.....

.....

.....

.....

.....

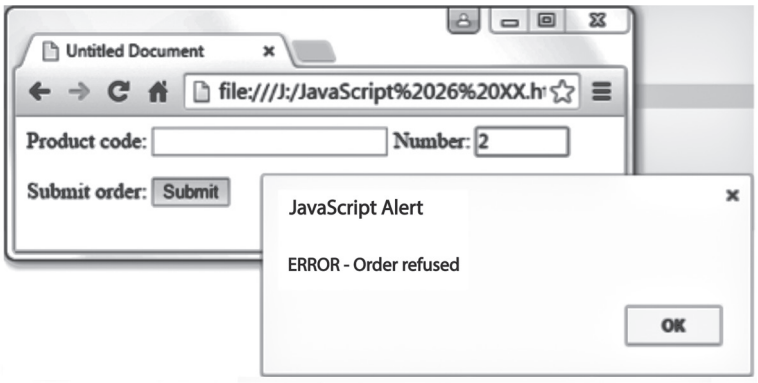
.....

.....

.....[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 5.

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.

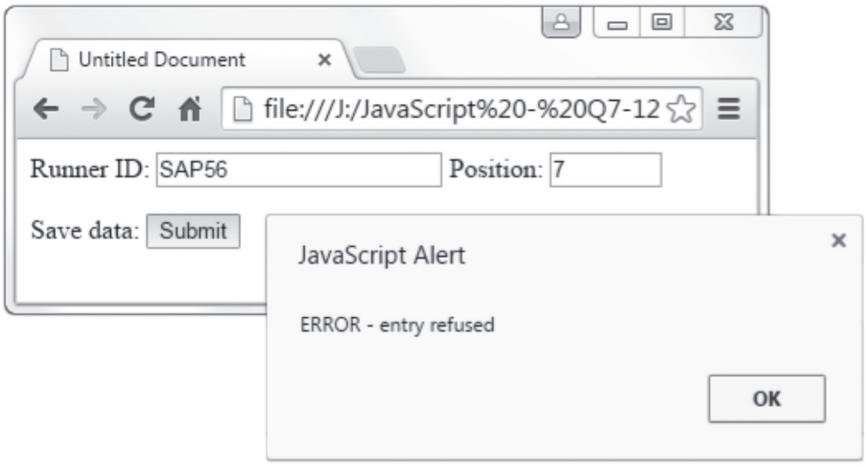
1. The user keys in the Uniform Resource Locator (URL) into the browser software.
2. .....
3. .....
4. .....
5. .....

[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 6.

2 **(a)** The diagram shows three items of software that translate program code.

Draw **one** line from each context to the correct item of translation software.

Context	Item of translation soft
A web page contains a client-side script.	Assembler
Each instruction in the source code consists of an op code and an operand.	Interpreter
The source code is required at run-time.	Compiler
When the source code is translated, copies of the executable program can be distributed without the need for the source code.	

[4]

(b) The Java programming language is said to be machine or platform independent.

(i) Describe what is meant by **machine independent**.

.....

.....[1]

(ii) Describe how a Java source code program is translated.

.....

.....

.....

.....[2]

QUESTION 7.

2 **(a)** The diagram shows three items of software that translate program code.

Draw **one** line from each context to the correct item of translation software.

Context	Item of translation soft
The source code is written in a high-level language. An executable file is produced.	Assembler
The source code uses instructions from the processor's instruction set.	Interpreter
The source code and translation software must both be in main memory at execution time.	Compiler
A web page contains some JavaScript code.	

[4]

(b) A programmer is developing software and has both a compiler and interpreter for the high-level language used.

Describe **two** benefits of using each form of translation software.

(i) Benefits of a compiler

1 .....

.....

2 .....

.....

[2]

(ii) Benefits of an interpreter

1 .....

.....

2 .....

.....

[2]

QUESTION 8.

6 A web page includes the following PHP and HTML code.

```
01 <?php
02     if(isset($_GET['age'])) {
03         echo "Result: ", allowed($_GET['age']);
04     } else {
05 ?>
06
07 <form action="#" method="get">
08     Enter Age: <input type="text" name="age" /><br/>
09     <input type="submit" value="Calculate" />
10 </form>
11
12 <?php
13       }
14       function allowed($age) {
15           if($age <= 16) $message = "You need permission";
16           else if($age > 30) $message = "You are too old";
17           else $message = "Allowed";
18           return $message;
19       }
20 ?>
```

(a) Name **two** identifiers used in the PHP code.

1 .....

2 .....
[2]

(b) Write the value assigned to `$message` if the user types `30` in the text box.

.....[1]

(c) Explain the purpose of the code in line `18`.

.....

.....

.....

.....[2]

(d) The PHP code in a web page uses server-side scripting.

List the sequence of events that take place when a user requests a web page cont
code.

.....

.....

.....

.....

.....

.....

.....

.....[4]

Question 7 begins on the next page.

QUESTION 9.

4 Customers of a bank can access their account information by logging in on the ba

(a) The bank has a client-server model of networked computers.

(i) Describe, using the bank as an example, the key features of a client-server model.

.....

.....

.....

.....

.....

..... [3]

(ii) Give **two** other examples of applications that can use the client-server model.

1 .....

.....

2 .....

.....

[2]

(b) The bank's customers log in to the website using a web application.

Explain why the web application uses server-side scripting.

.....

.....

.....

.....

.....

..... [3]

(c) The bank is upgrading its local area network (LAN) copper cables to fibre-op

(i) State **two** benefits to the bank of upgrading to fibre-optic cable from copper c

1 .....

.....

2 .....

.....

[2]

(ii) State **two** drawbacks of upgrading to fibre-optic cables.

1 .....

.....

2 .....

.....

[2]

(d) The bank uses a relational database, `ACCOUNTS`, to store the information a
and their accounts.

The database stores the customer's first name, last name and date of birth.

The bank has several different types of account. Each account type has a unique ID numb
name (for example, regular or saving) and bonus (for example, $5.00, $10.00 or $15.00).

A customer can have more than one account.

Each customer's account has its own ID number and stores the amount of money the customer has in that account.

The bank creates a normalised, relational database to store the required information. There are three tables:

- `CUSTOMER`
- `ACCOUNT_TYPE`
- `CUSTOMER_ACCOUNT`

(i) Write the attributes for each table to complete the database design for the bank.

`CUSTOMER(` .....

.....

.....`)`

`ACCOUNT_TYPE(` .....

.....

.....`)`

`CUSTOMER_ACCOUNT(` .....

.....

.....`)`

[3]

(ii) Identify the primary key for each table that you designed in **part (d)(i)**.

`CUSTOMER` .....

`ACCOUNT_TYPE` .....

`CUSTOMER_ACCOUNT` .....

[2]

(iii) Identify **one** foreign key in one of the tables that you designed in **part (d)(i)**.

Table name .....

Foreign key .....

[1]

(iv) The following table has definitions of database terms.

Write the correct database term in the table for each definition.

Definition	Term
All the data about one entity	
The data in one row of a table	
A column or field in a table	

[3]

QUESTION 10.

3 A web page includes the following JavaScript and HTML code.

```
01   <html>
02   <body>
03
04   <form>
05     <p><input type="text" id="textBox1"></p>
06     <button id = "button1" onclick="multiply()">First</button>
07     <button id = "button2" onclick="addition()">Second</button>
08   </form>
09
10   </body>
11   <script>
12     function multiply(){
13       value1 = document.getElementById("textBox1").value;
14       value1++;
15       alert(parseInt(value1)* parseInt(value1));
16     }
17
18     function addition(){
19       value1 = document.getElementById("textBox1").value;
20       alert(parseInt(value1) + parseInt(value1));
21     }
22   </script>
23   </html>
```

(a) Name **two** identifiers used in the JavaScript code.

1 .....

2 .....
[2]

(b) The number 9 is typed into `textBox1`.

Write the value that is output after `button1` is pressed.

..... [1]

(c) State the purpose of the code in line `14`.

.....

..... [1]

(d) Line `20` is replaced with:

```
20  alert(value1 + value1);
```

Describe how this will affect the program.

.....

.....

.....

..... [2]

QUESTION 11.

6 Willow is creating a website.

One of the web pages includes the following JavaScript code and HTML tags.

```
01  <html>
02  <body>
03  <form>
04    <p id="displayQuestion"></p>
05    <input type="text" id="answer">
06    <button id="submit" onclick="checkAnswer()"> Submit </button>
07  </form>
08  </body>
09  <script>
10    val1 = Math.floor((Math.random() * 10) + 1);
11    val2 = Math.floor((Math.random() * 10) + 1);
12    document.getElementById("displayQuestion").innerHTML = "What is" +
      val1.toString() + "*" + val2.toString() + "?";
13    function checkAnswer(){
14      userAnswer = document.getElementById("answer").value;
15      answer = val1 * val2
16      if (userAnswer == answer.toString()){
17        alert("Correct, well done");
18      }else{
19        alert("Sorry that's incorrect");
20      }
21    }
22  </script>
23  </html>
```

(a) (i) Name **three** functions in the JavaScript code.

1 .....

2 .....

3 .....

[3]

(ii) Identify **every line number** of the JavaScript code that generates an output.

.....

..... [2]

(iii) Identify the line number of the JavaScript code that takes data the user has input and stores it in a variable.

..... [1]

(iv) Describe the purpose of the code on line `16`.

.....

.....

.....

..... [2]

(b) Willow used functions from a JavaScript program library in the web page.

Describe the benefits to Willow of using program libraries to create the web page.

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.....

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..... [4]