

Answer **all** the questions.

1(a). The office workers of a large company each use a stand-alone computer.

The company is considering networking the machines.

(i) Describe what is meant by a LAN.

[2]

(ii) State **two** advantages of having a LAN instead of a set of stand-alone machines.

[2]

(b). Describe the following types of data transmission:

(i) Serial data transmission

[2]

(ii) Full duplex

[2]

2. Describe how packet switching is used to transmit data from one computer to another computer on a network.

[5]

3(a). Zuhair wants to create a Local Area Network (LAN) for himself and his family, in his home.

Describe what is meant by a LAN.

[2]

(b). TCP/IP uses packet switching.

Explain what is meant by packet switching.

[4]

4. A website has the following HTML code.

```
<html>
<head>
<title>My Stamp Collection - European Stamps</title>
</head>
<body>
<h1 style="font-family:Arial; color:darkGreen">United
Kingdom</h1>
<p>These are my stamps from the uk.</p>
<!-- Code A -->

<!-- Code B -->

</body>
</html>
```

the site's owner wants to add the photo UKstamps.jpg in place of the comment

```
<!-- Code A -->
```

The site's owner notices that his site doesn't come up high in the results from a search engine that uses the PageRank algorithm. State what would affect his site's ranking.

[2]

5(a). Explain what the code in Fig. 8.1 does.

[5]

(b). In certain scenarios the user's IP address is logged in a database.

(i) Describe what is meant by an IP Address.

[2]

(ii) Explain why the programmers have chosen to store the user's IP address.

[2]

(c). An extract from the database is shown below:

userID	name	passwordHash
1	admin	0e5a511
2	DenverJ34	f60ccdc
3	TaylorJ22	3a050bc

(i) The username admin is entered into the form.

State what the value of statement would be after line 03 of the code in Fig. 8 .1 is run.

----- **[1]**

(ii) State what the value of hashInDB would be after line 04 of the code in Fig. 8.1 is run.

----- **[1]**

(d). In SQL the character ; denotes the next statement and the characters — denote a comment.

The username DenverJ34'; DROP TABLE users; — is entered into the form.

(i) State what the value of statement would be after line 03 is run.

----- [1]

(ii) Describe what happens when line 04 is run.

----- [2]

(iii) State the name of a law the user has broken by entering the username DenverJ34'; DROP TABLE users; --

----- [1]

6(a). Explain **two** advantages of using packet switching instead of circuit switching to send a message between two computer on a network.

1

2

[4]

(b). When a message is transmitted it is liable to corruption.

(i) A system of transmission uses a parity bit in each byte of data to identify when an error has occurred.

One of the following bytes has been corrupted:

01101101

10101010

10111010

10100010

State which of the bytes has been corrupted and justify your answer.

[3]

(ii) Use the bytes:

01101101

10000001

10001000

to explain how a check sum is used to check data transmissions for errors.

[6]

7. InterMovie is a service that allows users to stream movies over the Internet.

When users have played a movie it remains stored in a cache on the user's computer. This means that someone wanting to access the same film in future can stream it from other users rather than directly from the company's servers.

(i) State what this network model is called.

----- [1]

(ii) Explain why the company might have opted for this model.

----- [2]

8. The computers in a car showroom are connected in a network with all data being held in a central server. The computers are used by the salesmen, but can also be used by customers to watch videos of the cars that are on offer.

What is meant by a protocol?

----- [2]

9. A coffee company has coffee shops located across the country. Each shop has its own Local Area Network (LAN). The company wants to connect the shops in a Wide Area Network (WAN).

(i) Describe **two** characteristics of a LAN.

1

2

[2]

(ii) Describe **two** characteristics of a WAN.

1

2

[2]

11. A school has three independent computer networks.

One for student use.

One for teacher use.

One for use in the administration offices.

The three networks are going to be combined to allow data to be stored in one location. The data will be accessible at any computer if the correct access codes are used.

Explain how the following devices may be used in the above situation.

(i) A bridge

----- [2]

(ii) A gateway

----- [2]

12. A coffee company has coffee shops located across the country. Each shop has its own Local Area Network (LAN). The company wants to connect the shops in a Wide Area Network (WAN).

Describe **one** piece of hardware that each shop will need to connect their LAN to the company's WAN.

[2]

The new network will enable the company to roll out a mobile phone application that allows people to place their orders before they arrive at the shop. The company is deciding whether to use a menu-driven interface or a natural language interface.


```
01 username = valueFromForm("username")
02 password = valueFromForm("password")
03 statement = "SELECT passwordHash FROM users WHERE name = '"
    + username + "'"
04 hashInDB = RunSQL(statement, siteDatabase)
05 if hashInDB == hash(password) then
06     //TO ADD: Generate success webpage
07 else
08     //TO ADD: Store IP address of user in database.
09 endif
```

Fig. 8.1

END OF QUESTION PAPER