



9.3 The internet part 2

Name: _____

Class: _____

Date: _____

Time: **239 minutes**

Marks: **165 marks**

Comments:

Q1.

Explain the difference between the World Wide Web, the Internet and an intranet.

Your answer to this question will also be assessed on your ability to organise your answer clearly and coherently in complete sentences, using specialist vocabulary where appropriate.



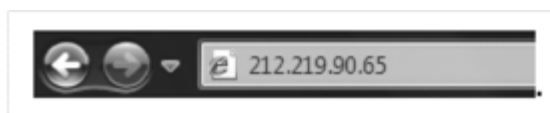
EXAM PAPERS PRACTICE

(Total 6 marks)

Q2.

The figure below shows the address bar of a web browser.

- (a) This is used to access various websites.



- (i) What does 212.219.90.65 represent?

_____ (1)

- (ii) Another way to access a website is to key a **URL** into the address bar.

What does URL stand for?

_____ (1)

- (b) Name and describe **two** features you would expect to find on the browser's menu or toolbar which are specific to browser software.

1. _____

Description: _____

2. _____

Description: _____

(2)

- (c) AQA Wanderers are a local soccer club which has a website. The club's players and members frequently access this website using the URL:

<http://www.footyhosting.co.uk/aqawanderers/home.asp>

The club pay an annual subscription to the company Footy Hosting Ltd to host the club's site. The company also hosts the sites for hundreds of other soccer clubs.

- (i) What is the **domain name** of the website being accessed?

_____ (1)

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(ii) Explain from the URL shown, how the company may have organised the storage of the pages for all the clubs it manages on its web server.

_____ (1)

- (d) The soccer club's own computer is used to manage and upload the page content for AQA Wanderers and is done using a broadband connection.

Select from the list below **the most probable value** for the **transfer rate** of the data using the broadband connection. Put a circle around your answer.

20 MB 1.6 GHz 200 bps (bits/sec) 2 Mbps 128 Kbps

(1)

- (e) The website for a single soccer club takes up approximately 5GB of storage space.

Footy Hosting Ltd currently has 500 clubs as customers and hopes to double this by the end of 2009.

- (i) What type of secondary storage is used for a web server?

(1)

- (ii) Select from the list below **one** value for the minimum size of web server required to host the sites for all clubs (including the proposed expansion in business). Put a circle around your answer.

50 MB 500 MB 20 GB 100 GB 8000 GB

(1)

(Total 9 marks)

Q3.

Since the introduction of chip and pin cards, UK card fraud losses have fallen significantly. However, they are still a serious problem.

- (a) How can fraudsters obtain your PIN without your realising it? Give **two** different ways.

1. _____

2. _____

(2)

- (b) Online transactions are still a major target for fraudsters. When making a purchase online, how can a purchaser know that the site is secure?

(1)

- (c) What security method is typically used for the transmission of personal data on a secure site?

(1)

EXAM PAPERS PRACTICE (Total 4 marks)

Q4.

SSL (Secure Socket Layer) is a protocol used by Internet browsers to transmit information securely. It uses a combination of *Symmetric Key* and *Public Key encryption*.

- (a) Explain the difference between Symmetric Key and Public Key encryption.

(3)

- (b) Amy uses her computer for online banking. When she logs on to her bank's website, her computer (computer A) and the bank's server (computer B) start a secure session using SSL. Computer B sends a symmetric key to computer A to encrypt all the personal data that is passed between the computers. This symmetric key is discarded at the end of the session.

- (i) When and how is the Public Key encryption used in this session?

(3)

- (ii) Why is the symmetric key encryption on its own not enough to protect the personal data during transmission between computer A and computer B?

(1)

(Total 7 marks)

Q5.

- (a) An IP address can be represented in the form w.x.y.z, where each letter represents the value of one byte of the IP address. Some addresses have special uses, such as w.x.y.1, which by convention is the default gateway address.

Explain how the default gateway address is used by a host computer connected to a network.

(2)

- (b) Using the Domain Name System (DNS) we can refer to IP addresses by host name. Explain the role of a Domain Name Server, which makes this possible.

(2)

(Total 4 marks)

Q6.

Describe the principles of operation of a packet-switching network.

(Total 3 marks)

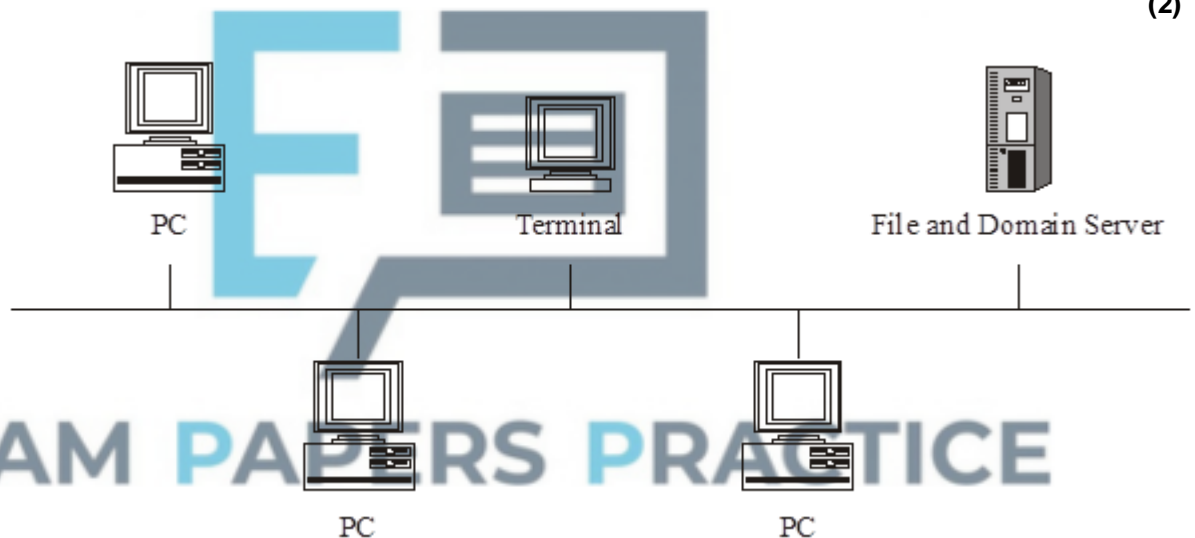
Q7.

A county has a number of local libraries in various towns. Books currently belong to each library and there is no system for the exchange of books between libraries.

Each library has a local area network (LAN) for lending and enquiries shown in the figure below.

- (a) (i) Describe what is meant by a local area network.

(2)



- (ii) What type of local area network topology is shown in the figure above?

(1)

- (iii) Does the network cable for this type of network use serial or parallel transmission of data?

(1)

- (iv) Name **one** other type of local area network topology.

(1)

- (v) Name **two** other devices which could be added to the network each of which would be a resource shared by users (administrators and/or borrowers) of the network.

1. _____

2. _____

(2)

- (b) There is currently an Internet connection from one of the PCs, and staff use this to contact a book supplier by keying the following into the address bar of the browser software.

<http://www.bargainbooks-r-us.co.uk/index.htm>

- (i) What is the **domain name** of the supplier?

(1)

- (ii) What is **index.htm**?

(1)

- (iii) Sometimes when the browser is used the software displays the error message

'Page Not Found'.

Give **one** possible reason for this, other than a misspelling of the URL.

(1)

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- (c) The decision has been made to connect each library to a wide area network.

- (i) Explain what is meant by a wide area network (WAN).

(2)

- (ii) Describe **two** benefits of connecting all the libraries to a WAN. **One** should be a benefit for a library administrator and **one** a benefit for a borrower.

1 Administrator _____

2 Borrower _____



(2)

Q8.

Figure 1 shows the home page for the Intranet site of XYZ College.

Figure 1

Simple Text Version		Intranet	External site	IT Help desk	Weather Site	First Class
		Computer Availability	Learning Resources	Staff Room	Student Services	

Business Accounts Economics Business Studies Applied Business Leisure Studies and Travel & Tourism Humanities Archaeology English Geology Geography Government and Politics History Law Philosophy Psychology Religious Studies Sociology Information Technology Computing	XYZ College Intranet UCAS CARDS Would all year one students read the intranet notice about applying for a UCAS card and follow the instructions, please? This needs completing before the end of term. <hr/> STUDENT COUNCIL ELECTIONS To all students There are 21 students standing for election as your Student Council and they are prepared to give their time and efforts to support you during your time at XYZ College. <hr/> EXAM CERTIFICATES Year 2 students – please collect your AS exam certificates from the Exams Office. <hr/> APPLICATIONS FOR UCAS CARD Year one students thinking of going to university are advised to apply for a UCAS (Universities and Colleges Admissions Service) Card by completing the registration on the UCAS web site this term. <hr/> The card will enable you to receive constant updates from UCAS and also discounts at selected shops and stores. You will be able to use it when we take you to the Higher Education Fair at ThisTown next March. Any university stands you visit will be able to take an imprint of your personal details to maintain contact with you. This can save a great deal of time and trouble for you.	Quick Links COURSE QUALITY QUESTIONNAIRE  Read the Student Bulletin  Information Available Here Careers Information WRITING AN EFFECTIVE PERSONAL STATEMENT STUDENT COUNCIL Intranet site Search Engines Engine 1 Engine 2
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(a) (i) What is an Intranet? _____

(1)

(ii) Give **two** reasons why a student would use this Intranet site.

1. _____

2. _____

(2)

(b) The college also has an external website shown in **Figure 2**.

Figure 2

Address <input type="text" value="http://www.xyzcollege.ac.uk/index.htm"/>									
Home	Contacts	Location	Information	Vacancies	Links	Downloads	Overseas Students	Services to Business	Sports Academy
						Search For <input type="text"/> in <input type="button" value="Courses"/> <input type="button" value="v"/> <input type="button" value="Go"/>			
Courses	Results	News	Events	Profiles	Enrichment	Campus	Support	Moving On	FAQs
The Campus Please select a building to view the wide range of facilities that the college has to offer.		Campus The College occupies a site of eight hectares, of which 70% is sports fields, in the south of ThisTown. The College buildings range in age from 1947 to 2003 and take their names from some of the world's finest jazz musicians. Over the period 2000 – 2003, two major building projects have resulted in the Davis Building and the Rollins Building, each providing outstanding facilities for teaching and learning, with additional facilities for music and sport. Also in 2003, the Max Roach Learning Resource Centre, at the heart of the campus, was extended and completely refurbished. Plans are currently in place for more new building, extension and refurbishment as the College grows both in size and reputation.				The Rollins Building The Learning Resource Centre The Rollins Building The Davis Building Music Modern Languages The Coltrane Building The Coltrane Building			
The Rogers Building There is currently no information listed for this building.		The Zawinal Building Art and Design							

Explain the various parts of the address bar contents.

(i) http

(1)

(ii) www

(1)

(iii) xyzcollege.ac.uk

EXAM PAPERS PRACTICE

(2)

(Total 7 marks)

Q9.

E-mail may be more easily intercepted and altered than paper mail without the knowledge of either the sender or the recipient.

In symmetric encryption, the same key is used to encrypt and decrypt a message. In asymmetric encryption, one key is used to encrypt a message and another key is used to decrypt the message.

(a) Why is symmetric encryption not used for encrypting e-mail messages?

(1)

- (b) In asymmetric encryption, one key is made publicly available (the public key) and the other key is kept secret by its owner (the private key). Jack and Jill want to communicate with each other confidentially, and they each have a private and a public key.

- (i) Which key should Jack use to encrypt a message to send to Jill, which only Jill can read?

(1)

- (ii) Which key can Jill use to decrypt the message sent by Jack?

(1)

- (c) A digital signature authenticates the message, that is, it verifies that the message came from the given sender and that it has not been tampered with.

- (i) How is a digital signature produced?

(3)

- (ii) If Jack digitally signs the message sent to Jill, how can Jill verify Jack's digital signature?

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(4)

(Total 10 marks)

Q10.

A company sets up a server-based network with ten terminals. Each terminal is a PC with its own secondary storage.

- (a) The network was recently created from an existing set of stand-alone computers, and is used by a team of programmers. Describe **two** advantages that networking the computers has brought to the programming team.

1. _____

2. _____

(2)

(b) The network manager has the choice of:

Option 1: Installing all the applications software on the server.

Option 2: Installing the applications software on the hard drive of each PC.

(i) Describe **one** advantage to the network manager of Option 1.

(1)

(ii) Describe **one** advantage to a terminal user of Option 2.

(1)

(c) Each terminal communicates with a printer using a *handshaking protocol*.

(i) Explain the term protocol.

EXAM PAPERS PRACTICE

(1)

(ii) Explain the term handshaking.

(2)

(d) Clients who use the company's website input

<http://www.smk-solutions.co.uk/index.htm>

into the address bar of their browser.

What is the domain name for the company?

(1)

Q11.

- (a) What type of software is needed to view web pages? (Do not give a product name.)

(1)

- (b) Most generic software has features such as printing, help, and formatting. Give **two** features which are specific to the software you named in part (a).

1. _____

2. _____

(2)

- (c) A computer user is accessing the World Wide Web for the home page, default.htm, of an organisation whose registered domain name is StationeryIsUs.co.uk.

What URL will allow the home page to be found and displayed?

(1)

- (d) What could be used instead of a domain name to identify a site on the World Wide Web?

(1)

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- (e) Domain names are organised on the World Wide Web as a hierarchy. Name **two** top level domains.

1. _____

2. _____

(1)

(Total 6 marks)

Q12.

When data is sent between **two** computer systems - the sender and the receiver - it is sometimes necessary to *encrypt* the data.

- (a) What is encryption?

(1)

- (b) A digital certificate consists of a public key and a private key. Anyone can know the public key but the private key should never be disclosed by its owner, the holder of the digital certificate.

Person A and Person B want to communicate via e-mail. Each has their own digital certificate and B has previously sent a digitally signed message to A. A wants to send B a message that only B can understand.

- (i) Which key should A use to encrypt this message?

(1)

- (ii) Which key does B have to use to decrypt the message?

(1)

- (c) B wants to send a reply to A.

A digital signature can be used to authenticate a message, that is, to show that it really has been sent by B and that it has not been tampered with.

B adds a digital signature to her message,

- (i) List the steps needed to generate the digital signature for B's message.

(3)

- (ii) What are the steps needed to check that B's message is authentic?

EXAM PAPERS PRACTICE

(4)

(Total 10 marks)

Q13.

- (a) What is meant by **each** of the following?

- (i) Internet

(1)

(ii) World Wide Web

(1)

(iii) Local Area Network

(1)

(iv) Wide Area Network

(1)

(v) Intranet

(1)

(b) Give an example of:

(i) a domain name;

(1)

(ii) an IP address.

(1)

(Total 7 marks)

Q14.

The following is the identifier of a web page.

<http://www.aqa.org.uk/qual/index.html>

Explain what **each** of the following parts of the above identifier mean.

(i) http_____

(1)

(ii) www_____

- _____ (1)
- (iii) org _____ (1)
- _____ (1)
- (iv) uk _____ (1)
- _____ (1)
- (v) qual _____ (1)
- _____ (1)
- (vi) index.html _____ (1)
- _____ (1)

(1)
(Total 6 marks)

Q15.

In the context of communication and networking, what is meant by **each** of the following?

- (a) Internet

(1)

- (b) Domain name

(1)

- (c) Intranet

(1)

- (d) URL

(1)

- (e) IP address

(1)

(Total 5 marks)

Q16.

An example of a Uniform Resource Locator (URL) is <http://www.bbc.co.uk/history>.

- (a) What part of the above URL constitutes the domain name?

(1)

- (b) Using the URL, explain what each part can tell us.

(i) http_____

(ii) www_____

(iii) bbc_____

(iv) co_____

(v) uk_____

(vi) history_____

(6)

- (c) The IP address of the above site is 212.58.224.32.

- (i) What is the relationship between the IP address and the domain name?

EXAM PAPERS PRACTICE

(1)

- (ii) If each group of digits is stored in one byte, what is the range of possible IP addresses?

(2)

(Total 10 marks)

Q17.

E-mail may be more easily intercepted and altered than paper mail without the knowledge of either the sender or the recipient.

- (a) Give **one** reason that supports **this** statement.

(1)

- (b) A single shared key system to encrypt and decrypt messages is not generally used for encrypted mail sent across the Internet. Instead, a two key system is used consisting of:

- A *public* key, which is made publicly available.
- A *private* key which is held only by its owner and should never be publicly enclosed.

- (i) How is this two-key system used to encrypt and decrypt e-mails?

(2)

- (ii) Holders of a digital certificate can digitally sign an e-mail to prove its origin and authenticity. How is this two-key public/private key system used to digitally sign an e-mail?

(2)

(Total 5 marks)

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Q18.

A small company has several stand-alone computers which staff use for word-processing letters and accessing the products catalogue, stored in a database, to answer telephone enquiries from customers. A copy of the database is stored on each machine.

- (a) The company has been advised that networking the computers would be beneficial.

- (i) State **two** advantages for the business of a local area network (LAN):

1. _____

2. _____

(2)

- (ii) What extra hardware is needed on each stand-alone computer to connect it to a LAN via cables?

(1)

- (b) Computers could be connected in a topology such as a star network or a bus network.

- (i) State **one** advantage of a star network over a bus network.

(1)

- (ii) State **one** advantage of a bus network over a star network.

(1)

- (c) The company director is also interested in trading via the internet, and is advised to get a *domain name*.

- (i) What is a domain name?

(1)

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- (ii) Give an example of a domain name.

(1)

- (d) A staff newsletter is published regularly and a copy pinned to the notice board for staff to read. One member of staff suggests it would be easier for colleagues to read the newsletter if it were published on the company *intranet*.

What is an intranet?

(2)

(Total 9 marks)

Q19.

An example of a domain name is www.aqa.org.uk.

(a) Using the above domain name, explain what each part can tell us.

- (i) www _____
- (ii) aqa _____
- (iii) org _____
- (iv) uk _____

(4)

(b) What is the relationship between a domain name and its IP address?

(1)

(Total 5 marks)

Q20.

Explain what is meant by packet switching in communication networks.

(Total 2 marks)

Q21.

The college allows access to the Internet from its networked stations. A student has misused this provision. How could the college use the auditing facilities provided by the system to trace the student?

(Total 2 marks)

Q22.

A company has all its records stored on the company's networked computer system which is also connected to the Internet. State **three** distinct ways in which the company's data might be corrupted or lost, and for **each** of the three suggest how the company could protect itself.

(2)

- (b) Various measures taken to combat viruses can be classified into four groups:

Preparation/Prevention,
Detection,
Containment,
Recovery.

Give **four** distinct measures that can be taken to combat viruses.

(8)

- (c) Give **two** ways a virus might escape detection, even after preventative measures have been taken.

(2)

(Total 12 marks)

Q25.

- (a) What is meant by a *wide area network*?

(1)

- (b) Explain the term *protocol* in the context of data transmission over a wide area network.

(2)

- (c) Why is a protocol needed for a wide area network?

(1)

(Total 4 marks)

