ST GEORGE'S EDINBURGH

OCR
Oxford Cambridge and RSA

Computer Science (J277)

U5 Networks Test Sep 25
Jack Walker

Please note that you may see slight differences between this paper and the original.

Candidates answer on the Question paper.

OCR supplied materials:
Additional resources may be supplied with this paper.

Other materials required:
- Pencil
- Ruler (cm/mm)

Duration: ~~55~~ 69 minutes.

- 25% extra time
- Laptop (no spellcheck for assessments)
- Digital reader Prompt
- Rest breaks in assessments (10 per 30)

Candidate forename	Lara	Candidate surname	MacDonald

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions, unless your teacher tells you otherwise.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Where space is provided below the question, please write your answer there.
- You may use additional paper, or a specific Answer sheet if one is provided, but you must clearly show your candidate number, centre number and question number(s).

INFORMATION FOR CANDIDATES

- The quality of written communication is assessed in questions marked with either a pencil or an asterisk. In History and Geog raphy a *Quality of extended response* question is marked with an asterisk, while a pencil is used for questions in which *Spelling, punctuation and grammar and the use of specialist terminology* is assessed.
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for this paper is **50**.
- The total number of marks may take into account some 'either/or' question choices.

1. (a). The owners of a large bakery have a Local Area Network (LAN) with a star topology. Each device in their network has its own MAC address, describe the structure of a MAC address

28 bits 8 sections 4 bit per sections

[2]

(b). They order their supplies over the Internet. When data is transmitted from the bakery to the supplier, network protocols are used.

Define what is meant by a 'network protocol'.

The way of which data is shared through the networks

[1]

(c). Explain **four** reasons why the bakery may use a star network topology for their LAN.

<hr size=0 width="100%" align=right>

Files easily acsessed for all computers, files are backed up,

[4]

2(a). A student is performing a range of actions on the internet using their computer.

A range of protocols are used for the transmission of data by the student's computer, and the web servers they are accessing.

i. Complete the table by identifying the most appropriate protocol for each of the tasks the student is performing.

Task	Protocol
Requesting to view a news webpage from a web server	http
Entering a username and password to access their bank account	
Downloading a text document from a web server	
Checking for new emails in their inbox	pop

[4]

ii. Some protocols have layers.

Give **two** reasons why protocols have layers.

1 security

2 Hgyftgugcgvghvbj

[2]

(b). The student's computer is part of their home Local Area Network (LAN). The LAN currently only has wired connections.

i. One characteristic of a LAN is that they are set up over a small geographical area.

Give **one** other characteristic of a LAN.

Theyre usually used in homes or small oficces

[1]

ii. Describe the benefits of the student changing their home LAN to include wireless connections.

[4]

iii. State **two** drawbacks of changing their home LAN to include wireless connections.

1 Not as secure

2 More expensive

[2]

3. The artist uploads images to be displayed on a website. This is a client-server relationship.

i. Identify the computer that is acting as the client in this scenario **and** justify your choice.

Client computer The artists device

Justification

[3]

ii. Identify the computer that is acting as the server in this scenario **and** justify your choice

Server computer Website/web server

Justification

[3]

4. A bank uses a local area network to connect all the computers in its head office.

Computers in the network can be identified using both IP addresses and MAC addresses.

Describe **two** differences between IP addresses and MAC addresses.

IP addresses change every time you connect to a different WIFI, while a MAC address does not change ever. Another difference is that IP adress is 16 bits and MAC address is 28 bits.

[4]

5. A law firm currently use a Local Area Network (LAN) linked to a Wide Area Network (WAN). They want to upgrade their system to utilise cloud storage.

Explain **two** advantages to the law firm of storing their data in the cloud.

One advantage of storing data on the cloud that the law firm may benefit from is it is less likley to get lost and is backed up more. And another is it can be more secure to keep it on the coloud

[4]

6. A company, OCR Supermarkets, has supermarket stores throughout the country. The computers for each store connect to the central office using a Wide Area Network (WAN).

OCR Supermarkets use a client-server network to connect the checkout computers to the store's server.

Describe **two** benefits to OCR Supermarkets of using a client-server network instead of a peer-to-peer network.

Benefit 1:

If one computer stops working it wont affect any of the others

Benefit 2:

[4]

7. A house has computers in each room and a central router. Every room allows both Ethernet and WiFi connections to the router.

i. Describe the purpose of the router in the house's network.

requests go throguh router

[2]

ii. Identify **two** additional items of network hardware, apart from cables and a router, that may be used within the house network.

1 switch

2 sserver

[2]

8. A rural village with a population of 50, including families, elderly residents, and remote workers, has just been connected to the Internet after previously having no access to mobile or Internet services.

Discuss how the introduction of Internet access could impact the village's residents and businesses.

In your answer, you may wish to explore:

- the effects on different groups of residents
- potential changes for local businesses
- ethical concerns
- privacy considerations

The connection of a rural village to the internet could be potentially very good for the village, especially for business and school. it can also be dangerous or hard to work for the village if nobody had any access to any internet beforehand. Which also gives the chance for everyone in the community to learn, since they most likley all have the same knowledge on internet useage. Which could also be a bad thing, if some of the people do not have any awareness of potential threats, e.g. scams or viruses.

Connecting to the internet in a rural village could open the opertunity for advertizing the village and could bring tourists and potentially even other residents to the village, increasing the income of the village and the shops in it. Residents of the village can also have acsess to more job opertunities than before, being able to work from home. this could also change the amount of people who work in the village, as people may leave their works in a shop for a job where they can work from home. this would result in service jobs such as café, resteraunt and shop jobs to become understaffed, less people may want to go to these places which can affect the businesses income negativly.
These business owners could go another route, and take advantage of the internet and use it to sell their items online, or advertise their shops online. Which could lead to more sales.

Schools in the village could also change dramatically for the better. Utilizing the internet as a learning tool. Other residents can also join an online school which could be beneficial for them individually.

Since the internet has not been accessible to the village prior to the introduction of it to its residents, they may not be aware of potential threats or concerns that would be dangerous to interact with. Such as a virus or a scam. Even agreeing to have their information sold unwillingly, because of the lack of knowledge for online interactions.

[8]

END OF QUESTION PAPER