

# 1.3.3

## **NETWORKS**

### **TOPIC WISE EXAM QUESTIONS**

**A-LEVEL**

**OCR**

a) Characteristics of networks and the importance of protocols and standards.	Candidates need to understand the definition and purpose of a network.
b) The internet structure: <ul style="list-style-type: none"><li>• The TCP/IP Stack.</li><li>• DNS</li><li>• Protocol layering.</li><li>• LANs and WANs.</li><li>• Packet and circuit switching.</li></ul>	<p>Candidates need to understand the purpose of, and importance of using protocols. They should be able to discuss examples of protocols that may be used in a network/the internet (but will not be asked to recall information about any specific protocol). Candidates should understand the term standard and the purpose and need for standards in a network (or any situation where data is transferred).</p> <p>Candidates need to understand the purpose and benefits of layering protocols, particularly within the TCP/IP stack. Candidates need to know the different layers within the TCP/IP stack and the purpose of each. Candidates need to understand how data is transmitted on the Internet, the use of IP addresses and packets in the transfer of data. (NB Candidates are not expected to be familiar with the OSI model).</p>
c) Network security and threats, use of firewalls, proxies and encryption.	Candidates are expected to understand the terms LAN and WAN.
d) Network hardware.	Candidates need to understand how the Domain Name System is used to find the IP of a URL is found.
e) Client-server and peer to peer.	<p>Candidates need to understand the purpose, function, benefits and drawbacks of both packet and circuit switching. Candidates need to be able to suggest packet or circuit switching for a given scenario.</p> <p>Candidates need to understand that there are a range of security issues and threats involved with networked computers. Candidates need to be aware of threats such as hackers, viruses, unauthorised access, denial of service, spyware, SQL injection, phishing and pharming. Candidates need to know about ways of minimising, or preventing these threats for example firewalls, secure passwords, anti-virus, anti-spyware etc.</p> <p>Candidates need to have knowledge of the hardware required to connect to and/or build a network (e.g. modem, router, cable, NIC, Wireless Access Points, hub, switch etc). Candidates need to understand the purpose of the hardware, but are not required to understand how they physically work.</p> <p>Candidates need to understand the difference between a client-server and peer-to-peer network.</p> <p>Candidates need to know the benefits and drawbacks of each type of network and be able to recommend one for a given scenario.</p>

1 A small manufacturing business uses networked computers with closed source application software installed.

(d) All computers owned by the business are connected together into a Local Area Network (LAN). Various network protocols are used in this network.

(i) Give **three** advantages to the business of connecting computers together in a LAN.

- 1 .....
- 2 .....
- 3 .....

[3]

(ii) Explain what is meant by a network protocol.

- .....
- .....
- .....

[2]

(iii) Give the names of **two** protocols that may be used in a LAN.

- 1 .....
- 2 .....

[2]

(iv) Explain why protocol layering is used.

- .....
- .....
- .....
- .....
- .....

[3]

6 Zac has an accountancy business. He is moving into an office that has enough space for up to five members of staff. Zac would like to install a Local Area Network (LAN) to allow his staff to work together.

(a) (i) A LAN uses packet switching.

Describe **one** difference between packet switching and circuit switching.

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..... [2]

(ii) Explain why packet switching is more suitable for a computer network than circuit switching.

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..... [2]

(b)\* Zac has hired a company that will advise him on what type of LAN he should set up.

Discuss how Zac could set up a peer-to-peer network and a client-server network.

You should refer to the following in your answer: [9]

- how the computers in each type are connected
- the benefits of each type
- the drawbacks of each type
- the suitability of each type.

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6 Anika's computer runs a multi-tasking operating system. She has access to a printer and a broadband internet connection through a wireless connection. The operating system uses scheduling algorithms such as first come first served and round-robin.

(b) Anika uses an encrypted messaging program to communicate with her friends. The computer uses the TCP/IP stack.

(i) Explain what happens at the application layer of the TCP/IP stack when using this program.

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..... [5]

(ii) Explain what happens at the link layer (sometimes referred to as the "network interface layer", "network access layer" or simply the "network layer") of the TCP/IP stack when using this program.

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..... [2]



1 A hotel uses a computer system to keep track of room bookings. The hotel staff are able to query a database to discover which rooms are booked or which rooms are free.

(a) The hotel's computer network uses a client-server model.

(i) Describe what is meant by the term 'client-server' in this context.

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..... [3]

(ii) Give **two** advantages of client-server compared to peer-to-peer.

1 .....  
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2 .....  
..... [2]

The hotel's network uses multiple switches.

(b) Explain the purpose of a network switch.

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..... [3]



4 The internet can be considered an example of a WAN.

(a) Describe what is meant by the term 'WAN'.

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..... [2]

(b) The internet uses a set of protocols referred to as the TCP/IP stack. The TCP/IP stack consists of four different layers, each with its own set of protocols.

(i) Explain why protocols are important on a network.

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..... [2]

(ii) State the name of the **four** layers of the TCP/IP stack.

1 .....  
2 .....  
3 .....  
4 ..... [4]

1 An architect firm specialises in designing skyscrapers.

(c) The computers in the office are connected to a LAN which is connected to the Internet.

(i) The LAN is set up in a client-server network.

Give **one** advantage and **one** disadvantage to the architects' firm of a client-server set up rather than a peer to peer setup.

Advantage .....

.....

Disadvantage .....

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[2]

(ii) The LAN is connected to the Internet via a firewall. Describe the term 'firewall'.

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..... [1]

(iii) State why the architects' firm would use a firewall.

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..... [1]

7 A company releases an Internet connected fridge. Users can email messages to the fridge and it puts them on its display.

(a) The fridge uses the TCP/IP stack.

Explain what is meant by the term 'TCP/IP stack'.

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..... [3]

AS - Level

1. 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

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----- [2]

- (ii) A gateway

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----- [2]

**If you found this  
useful, drop a follow  
to help me out!**

**THANK YOU!**

**GCST**