1. Networking Devices

2 Communication

2.1 Networks including the Internet

Candidates should be able to:	Notes and guidance
Show understanding of the purpose and benefits of networking devices	
Show understanding of the characteristics of a LAN (local area network) and a WAN (wide area network)	
Explain the client-server and peer-to-peer models of networked computers	Roles of the different computers within the network and subnetwork models
	Benefits and drawbacks of each model
	Justify the use of a model for a given situation
Show understanding of thin-client and thick-client and the differences between them	
Show understanding of the bus, star, mesh and hybrid topologies	Understand how packets are transmitted between two hosts for a given topology
	Justify the use of a topology for a given situation
Show understanding of cloud computing	Including the use of public and private clouds.
	Benefits and drawbacks of cloud computing
Show understanding of the differences between and implications of the use of wireless and wired networks	Describe the characteristics of copper cable, fibre-optic cable, radio waves (including WiFi), microwaves, satellites
Describe the hardware that is used to support a LAN	Including switch, server, Network Interface Card (NIC), Wireless Network Interface Card (WNIC), Wireless Access Points (WAP), cables, bridge, repeater
Describe the role and function of a router in a network	
Show understanding of Ethernet and how collisions are detected and avoided	Including Carrier Sense Multiple Access / Collision Detection (CSMA/ CD)
Show understanding of bit streaming	Methods of bit streaming, i.e. real-time and on-demand
	Importance of bit rates / broadband speed on bit streaming
Show understanding of the differences between the World Wide Web (WWW) and the internet	
Describe the hardware that is used to support the internet	Including modems, PSTN (Public Switched Telephone Network), dedicated lines, cell phone network

2.1 Networks including the internet continued

Explain the use of IP addresses in the transmission of data over the internet	Including: - format of an IP address including IPv4 and IPv6 - use of subnetting in a network - how an IP address is associated with a device on a network - difference between a public IP address and a private IP address and the implications for security - difference between a static IP address and a dynamic IP address
Explain how a Uniform Resource Locator (URL) is used to locate a resource on the World Wide Web (WWW) and the role of the Domain Name Service (DNS)	

Networking Devices

Benefits of networking devices:

- Devices, such as printers, can be shared.
- Licences to run software on networks are often far cheaper than buying licences for an equivalent number of stand-alone computers.
- Users can share files and data
- Data and files can be backed up centrally at the end of each day
- User can communicate using email and instant messaging
- A network manager can oversee the network and, for example, apply access rights to certain files, or restrict access to external networks, such as the internet.
- The employee's computers are the clients
- The server hosts the (shared) files
- An employee can request a file from the server from any of the client computers
- Several employee can access the same file at the same time.