

1.3 EXCHANGING DATA · 1.3.3

Network hardware, client-server & P2P — Mark scheme

32 marks · spec 1.3.3(d)(e)

AO key: AO1 = knowledge & understanding · AO2 = application · AO3 = reasoned judgements. Accept any valid alternative; do not award the same point twice.

Q	ANSWER	AO	MARKS
1(a)	Connects devices on a LAN (1); uses MAC addresses to identify devices (1); forwards each frame only to the device it is addressed to (1). (3)	AO1	3
1(b)	A (unique) MAC address. (1)	AO1	1
1(c)	Any one: twisted-pair copper cable · coaxial cable · fibre-optic cable. (1)	AO1	1
1(d)	Allows devices to connect to the network wirelessly (over Wi-Fi). (1)	AO1	1

Q	ANSWER	AO	MARKS
2(a)	A switch connects devices within a LAN and forwards by MAC address (1); a router connects different networks and routes packets by IP address (1). (2)	AO1	2
2(b)	A router connects networks using the same protocols (1); a gateway connects networks using different protocols (translating between them) (1). (2)	AO1	2
2(c)	A hub broadcasts data to all devices (wastes bandwidth / less secure / causes collisions). (1)	AO2	1

Q	ANSWER	AO	MARKS
3(a)	A central server provides resources/services (1); clients send requests to the server (1); the server manages security/storage/authentication centrally (1). (3)	AO1	3
3(b)	1 mark each, max 2: centralised security · central storage / file management · central backup · easier to control user access / update software centrally. (2)	AO1	2
3(c)	Any one: a small home network · simple file sharing between a few computers · low budget / no need for central control. (1)	AO2	1

Q	ANSWER	AO	MARKS
4(a)	A (powerful) computer that provides resources or services to clients on request. (1)	AO1	1
4(b)	Any one developed: it is expensive (1) as it needs a dedicated server and expertise to manage (1); OR the server is a single point of failure (1) so if it fails, clients lose access to services (1). (2)	AO2	2

Q	LEVELS-OF-RESPONSE MARK SCHEME	AO	MARKS										
5	Mark using the levels descriptors below. AO1 (knowledge of models/hardware), AO2 (application to the company), AO3 (justified recommendation). <table><tr><th>LEVEL</th><th>DESCRIPTOR</th></tr><tr><td>Level 3 (9–12)</td><td>Recommends a model with accurate reasons, names the required hardware, all clearly applied to the company's needs, with a justified recommendation weighing cost vs control. Well structured.</td></tr><tr><td>Level 2 (5–8)</td><td>Covers the model and some hardware with some application and partial justification.</td></tr><tr><td>Level 1 (1–4)</td><td>Basic points about the models or hardware with little application or justification.</td></tr><tr><td>0</td><td>Nothing creditworthy.</td></tr></table> Indicative content (credit any valid point): • Client–server fits: 30 staff, secure logins, central backup and shared files all argue for a central server managing security and storage. • Hardware: a server; a switch to connect wired devices on the LAN; a router for internet access; NICs in each device; cabling (twisted-pair/fibre); a WAP for any wireless devices; the shared printer on the network. • Trade-off: client–server costs more (server + admin) and the server is a single point of failure; mitigate with backups/redundancy. • Peer-to-peer would be cheaper but cannot easily provide central security or backup for 30 machines. • Justified recommendation: client–server, because the company values secure logins and central backup over minimal cost.	LEVEL	DESCRIPTOR	Level 3 (9–12)	Recommends a model with accurate reasons, names the required hardware, all clearly applied to the company's needs, with a justified recommendation weighing cost vs control. Well structured.	Level 2 (5–8)	Covers the model and some hardware with some application and partial justification.	Level 1 (1–4)	Basic points about the models or hardware with little application or justification.	0	Nothing creditworthy.	AO1 ×4 AO2 ×4 AO3 ×4	12
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Total for paper: 32 marks