

1.3 EXCHANGING DATA · 1.3.3

Networks, protocols & standards — Mark scheme

33 marks · spec 1.3.3(a)

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)	Local Area Network. (1)	AO1	1
1(b)	1 mark each, max 3: share files/data · share hardware (e.g. a printer) · central backup/management · communication between users · shared internet connection. (3)	AO1	3
1(c)	Any one: a LAN covers a small area / the organisation owns the hardware; a WAN covers a large area / uses third-party infrastructure. (1)	AO1	1

Q	ANSWER	AO	MARKS
2(a)	A set of rules (1) governing how data is transmitted between devices (format, speed, error checking, etc.) (1). (2)	AO1	2
2(b)	Without shared rules devices could not understand each other (1); protocols let different hardware/software communicate and ensure correct/reliable transfer (1). (2)	AO2	2
2(c)	1 mark each, max 2: TCP/IP · HTTP · HTTPS · Ethernet · FTP, etc. (2)	AO1	2

Q	ANSWER	AO	MARKS
3(a)	Each device connects to a central switch/hub (1); data passes via the central device (1). (2)	AO1	2
3(b)	Devices connect to many other devices (1), giving multiple paths for data between nodes (1). (2)	AO1	2
3(c)	More resilient (1): if one link fails, data can be rerouted via another path (no single point of failure) (1). (2)	AO2	2

Q	ANSWER	AO	MARKS
4(a)	An agreed, published specification (1) that manufacturers/developers follow (1). (2)	AO1	2
4(b)	They ensure interoperability (1) so equipment/software from different manufacturers works together (1). (2)	AO2	2

Q	LEVELS-OF-RESPONSE MARK SCHEME	AO	MARKS										
5	Mark using the levels descriptors below. AO1 (knowledge of networks/protocols/standards), AO2 (application to the office), AO3 (justified recommendations). <table><tr><th>LEVEL</th><th>DESCRIPTOR</th></tr><tr><td>Level 3 (9–12)</td><td>Recommends a suitable network type and topology, accurately explains the role of protocols and standards, all clearly applied to the office, with justified recommendations. Well structured.</td></tr><tr><td>Level 2 (5–8)</td><td>Covers most aspects with some application and partial justification.</td></tr><tr><td>Level 1 (1–4)</td><td>Basic points about networks with little application to the office or justification.</td></tr><tr><td>0</td><td>Nothing creditworthy.</td></tr></table> Indicative content (credit any valid point): • Type: a LAN, because all departments are on one site and the office owns the hardware; connected to the internet (a WAN) via a router. • Topology: a star topology via a central switch suits an office (fast, easy to add devices), though the switch is a single point of failure. • Protocols: TCP/IP, HTTP(S), Ethernet let the different devices communicate reliably. • Standards: ensure equipment from different manufacturers (PCs, printer, router) interoperate. • Justified recommendation: a star LAN over Ethernet/TCP-IP, sharing files and the printer, with an internet router.	LEVEL	DESCRIPTOR	Level 3 (9–12)	Recommends a suitable network type and topology, accurately explains the role of protocols and standards, all clearly applied to the office, with justified recommendations. Well structured.	Level 2 (5–8)	Covers most aspects with some application and partial justification.	Level 1 (1–4)	Basic points about networks with little application to the office or justification.	0	Nothing creditworthy.	AO1 ×4 AO2 ×4 AO3 ×4	12
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Total for paper: 33 marks