1.3 EXCHANGING DATA · 1.3.3

The Internet — Mark scheme

32 marks · spec 1.3.3(b)

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)	1 mark each: application (1); transport (1); internet/network (1); link (1). (4)	AO1	4
1(b)	Adds IP addresses / routes packets across networks. (1)	AO1	1
1(c)	Any one: HTTP · HTTPS · SMTP · FTP. (1)	AO1	1

Q	ANSWER	AO	MARKS
2(a)	Domain Name System. (1)	AO1	1
2(b)	It translates the domain name into an IP address (1); the browser then connects to that IP address (1). (2)	AO1	2
2(c)	Users can remember readable names (1) instead of numeric IP addresses, which may also change (1). (2)	AO2	2

Q	ANSWER	AO	MARKS
3(a)	Dividing networking into separate layers (1), each with a defined job and a fixed interface to the next (1). (2)	AO1	2
3(b)	2 benefits, 1 mark + 1 for development, max 3: • a layer can be changed/replaced independently without affecting the others (1) • easier to develop, understand and maintain (1) • different manufacturers can work on different layers (1)	AO1	3

Q	ANSWER	AO	MARKS
4(a)	The message is split into packets (1); each is labelled (destination/source/sequence number) and travels possibly by different routes (1); packets are reassembled in order at the destination (1). (3)	AO1	3
4(b)	It is detected as missing and resent / retransmitted. (1)	AO1	1

Q	LEVELS-OF-RESPONSE MARK SCHEME	AO	MARKS
5	Mark using the levels descriptors below. AO1 (knowledge of switching/TCP-IP), AO2 (application to the video-call app), AO3 (justified conclusion).	AO1 ×4 AO2 ×4 AO3 ×4	**12**

LEVEL	DESCRIPTOR
Level 3 (9–12)	Accurately compares packet and circuit switching and explains how the TCP/IP stack supports reliable delivery, clearly **applied** to the app, with a **justified** conclusion. Well structured.
Level 2 (5–8)	Covers both switching methods and the stack with **some** application and partial justification.
Level 1 (1–4)	Basic points about switching or the stack with little application or justification.
0	Nothing creditworthy.

Indicative content (credit any valid point):

- Packet switching shares the network efficiently and reroutes around failures, suiting internet traffic; circuit switching reserves a dedicated path (guaranteed bandwidth) but wastes capacity.
- The internet uses packet switching, so the app's data is split into packets.
- Transport layer (TCP) numbers packets, checks they arrive and resends lost ones, then reassembles them in order — giving reliability.
- Internet layer adds IP addresses so packets are routed to the right user.
- Conclusion: packet switching with TCP is appropriate for reliable delivery; a justified trade-off (e.g. latency vs reliability for live video).

Total for paper: 32 marks