MODULE E NETWORKS · E4

Network hardware: mark scheme

20 marks · OCR J277 spec 1.3.1: the hardware needed to connect stand-alone computers into a LAN (wireless access points, routers, switches, NIC, transmission media) and the tasks performed by each piece of hardware

How to use. 1 mark per bullet up to the maximum shown. **/** separates alternative answers. Words in (brackets) are not needed for the mark. Credit any other valid answer that shows the same understanding.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) J277 1.3.1	Radio waves to a wired network: Wireless access point LAN to the internet: Router Hardware inside a device: NIC Within a LAN, only to the intended device: Switch	**4**	1 mark per correct row. 2+ ticks in a row = 0 for that row.
2(a) J277 1.3.1	Copper cable / Ethernet cable / twisted pair cable Fibre optic cable	**2**	1 mark per bullet, max 2. Accept coaxial cable as a copper example. Do not accept "cable" / "wire" alone. Two types of copper cable = 1 mark max. Do not accept radio waves / Wi-Fi here.
2(b) J277 1.3.1	Radio waves	**1**	Do not accept "Wi-Fi" / "the air" / "signal" alone.
3(a) J277 1.3.1	The switch reads the (destination) MAC address (of the data) It sends the data only to the port / cable connected to the device with that MAC address It stores which MAC address is connected to which port	**2**	1 mark per bullet, max 2. Do not accept "IP address" for the switch. Do not accept "sends it to all devices".
3(b) J277 1.3.1	A switch only connects devices within the (same) LAN A router connects the LAN to another network / to the internet / to a WAN A router sends data between networks using IP addresses	**2**	1 mark per bullet, max 2. Do not accept "faster" / "more secure" alone.
4(a) J277 1.3.1	Wireless access point / WAP	**1**	Accept a (home) router with a built-in wireless access point. Do not accept "router" alone / "Wi-Fi" / "switch".

QUESTION	ANSWER	MARKS	GUIDANCE
4(b) J277 1.3.1	A NIC is the hardware (every) device needs to connect to a network The (wireless) NIC sends and receives the data (as radio waves) // communicates with the wireless access point The NIC has a (unique) MAC address, so data can be sent to the laptop	**2**	1 mark per bullet, max 2. Do not accept "to get Wi-Fi" alone.
5(a) J277 1.3.1	A NIC in each device (1) ... so that each computer / tablet can connect to the network // send and receive data (1) Transmission media // Ethernet / copper / fibre optic cables (1) ... carry the data between the desktops and the switch (1) A switch (1) ... connects the desktops within the LAN // sends data only to the intended device using MAC addresses (1) A wireless access point (1) ... lets the tablets connect to the wired network using radio waves (1) A router (1) ... connects the LAN to the internet // sends data between networks using IP addresses (1)	**6**	1 mark for each piece of hardware and 1 for its task, max 6. A task mark is only given with its matching hardware. A list of names with no tasks: max 3. A home "router" that combines router, switch and access point: credit each role only where it is explained. Do not credit a server / modem / "the Cloud" as LAN hardware.

Total: 20 marks