MODULE E NETWORKS · E4

Network hardware: mark scheme

20 marks · Cambridge 0478 syllabus 3.4.1 (a computer needs a NIC to access a network; a NIC is given a MAC address at the point of manufacture) and 3.4.4 (the role of a router)

How to use. One mark per creditworthy point up to the maximum shown. **/** separates alternative words; **//** 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) 0478 3.4.1	Network interface card // NIC	**1**	Accept network interface controller. Do not accept router / modem / switch.
1(b) 0478 3.4.1 (notes)	MAC address // media access control address	**1**	Do not accept IP address.
1(c) 0478 3.4.1, 3.4.4	Connect a local network to the internet: True Router gives the MAC address: False Router can assign IP addresses: True No NIC but plugged into a router: False	**4**	One mark per correct row. A row with both boxes ticked scores 0.
2(a) 0478 3.4.4	Any three from: Sends / forwards data to a specific destination on a network Uses the (destination) IP address to decide where to send the data Connects a local network to the internet // connects networks together Can assign IP addresses to devices on the network Receives data from the internet and passes it to the correct device on the local network	**3**	max 3. Do not accept "gives the internet / Wi-Fi" alone. Do not credit "assigns MAC addresses".
3(a) 0478 3.4.4	Any two from: The router reads the destination // IP address of the data Each computer on the network has its own IP address (assigned by the router) The router sends the data to the specific destination // computer with that IP address	**2**	max 2. Do not accept "the router sends it to every computer".

QUESTION	ANSWER	MARKS	GUIDANCE
3(b) 0478 3.4.4	Any two from: So the laptop can be identified on the network So data can be sent to the laptop // the router knows where to send data meant for it An IP address is allocated by the network (not set at manufacture) // the laptop has no IP address for this network yet So no two devices on the network have the same IP address	**2**	max 2. Accept "the IP address may be dynamic / change each time it joins". Do not credit answers saying the router assigns the MAC address.
4(a) 0478 3.4.1	Any two from: The printer needs (its own) network interface card // NIC to access a network A router alone is not enough // the router sends data / connects networks, it does not give a device access to the network Without a NIC the printer cannot send or receive data on the network // has no MAC address	**2**	max 2. Accept "the printer must have a NIC (built in)" for the first point.
5(a) 0478 3.4.1, 3.4.4	Any five from: **NIC:** the computer needs a NIC to access the network the NIC has a MAC address, given at manufacture, that identifies it the NIC sends / receives the data (the request) to / from the network **Router:** assigns an IP address to the computer (when it joins the network) connects the local network to the internet sends / forwards the request to a specific destination // the server using the (destination) IP address sends the reply / file back to the computer that asked for it (using its IP address)	**5**	max 5. Max 3 if only the NIC or only the router is described. Do not credit "the router gives the computer its MAC address" or "the NIC connects networks together".

Total: 20 marks