1.5 Networks and Topologies: 10-minute Pack

OCR J277 · Calculators not allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State the piece of network hardware described in each case.

(a) Connects a LAN to another network (such as the internet) and directs data packets between the two networks based on IP address. **(1)**

(b) Connects multiple wired devices within a LAN and forwards each data frame only to the specific device it is addressed to, using the device's MAC address. **(1)**

(c) Allows wireless devices to join a wired network by transmitting and receiving data using radio waves. **(1)**

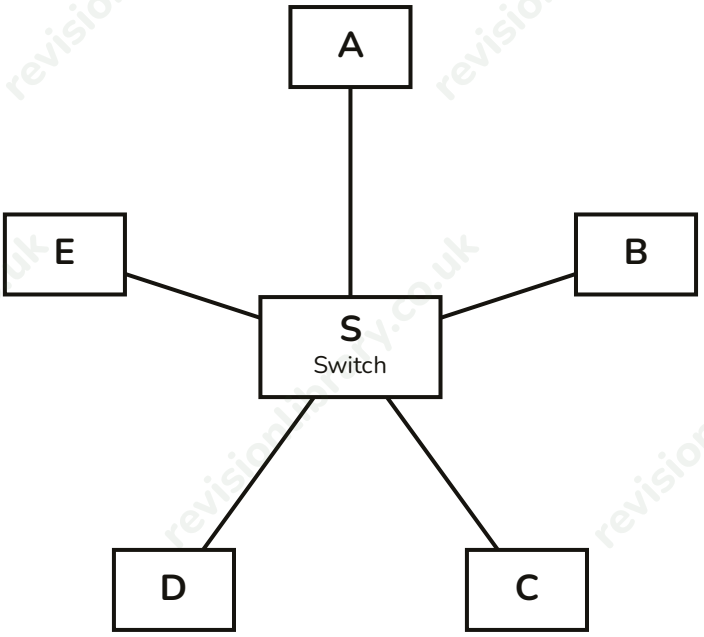
(d) Hardware, built into or fitted inside a device, that allows the device to connect to a network and is given a unique MAC address by its manufacturer. **(1)**

(e) Converts digital data from a computer into a signal suitable for transmission over a telephone/broadband line, and converts the incoming signal back into digital data. **(1)**

(Total for Question 1 is 5 marks)

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2 The diagram below shows part of a small office network.



(a) Identify the network topology shown in the diagram. **(1)**

(b) Give two advantages of using a star topology rather than a mesh topology to connect the computers in a small office. **(2)**

(c) Give two disadvantages of using a star topology rather than a mesh topology. **(2)**

(Total for Question 2 is 5 marks)

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Mark scheme · 1.5 Networks and Topologies: 10-minute Pack

Question 1

(a) router **B1**

(a) Answer: Router

(b) switch **B1**

(b) Answer: Switch

(c) wireless access point (WAP) **B1**

(c) Answer: Wireless Access Point (WAP)

(d) network interface card / controller (NIC) **B1**

(d) Answer: Network Interface Card / Controller (NIC)

(e) modem **B1**

(e) Answer: Modem

Question 2

(a) star topology **B1**

(a) Answer: Star topology

(b) requires far less cabling (one cable per device to the switch), so is cheaper and simpler to install (oe) **B1**

(b) easier to add a new device - only one new cable is needed to the switch, rather than a new cable to every existing device (oe) **B1**

(b) Answer: Less cabling needed (cheaper/simpler); easier to add new devices.

(c) the network relies on the central switch - if it fails, no devices can communicate with each other (single point of failure) **B1**

(c) there is only one path between any two devices (via the switch), so a faulty cable/switch port breaks that connection, whereas a mesh offers alternative routes/redundancy **B1**

(c) Answer: Central switch is a single point of failure; only one route between devices, so no redundancy.

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