3.4 Hardware – Network hardware
QUESTIONS

3.4 Network hardware				
1	Understand that a computer needs a network interface card (NIC) to access a network			
2	Understand what is meant by and the purpose of a media access control (MAC) address, including its structure			
3	(a) Understand what is meant by and the purpose of an internet protocol (IP) address			
3	(b) Understand that there are different types of IP address			
4	Describe the role of a router in a network			

More Guidance:

3.4 Network hardware

Candidates should be able to:	Notes and guidance
1 Understand that a computer needs a network interface card (NIC) to access a network	
2 Understand what is meant by and the purpose of a media access control (MAC) address, including its structure	• A network interface card is given a MAC address at the point of manufacture • MAC addresses are usually written as hexadecimal • MAC addresses are created using the manufacturer code and the serial code
3 (a) Understand what is meant by and the purpose of an internet protocol (IP) address (b) Understand that there are different types of IP address	• An IP address is allocated by the network and they can be static or dynamic • Including the characteristics of and differences between IPv4 and IPv6
4 Describe the role of a router in a network	• A router sends data to a specific destination on a network • A router can assign IP addresses • A router can connect a local network to the internet

3.4 Hardware – Network hardware
QUESTIONS

8 Draw and annotate a diagram to represent the role of a router.

[4]

3.4 Hardware – Network hardware
QUESTIONS

6 A user wants to connect their computer to a network.

(a) **(i)** Identify the component in the computer that is needed to access a network.

..... [1]

(ii) Identify the type of address that is allocated to the component by the manufacturer, which is used to uniquely identify the device.

..... [1]

(b) A dynamic internet protocol (IP) address is allocated to the computer when it is connected to the network.

(i) Identify the device on the network that can connect multiple devices and automatically assign them an IP address.

..... [1]

(ii) Describe what is meant by a dynamic IP address.

.....

.....

.....

.....

.....

..... [3]

3.4 Hardware – Network hardware
QUESTIONS

8 A computer is connected to a network and assigned an IPv4 address.

(a) Tick (✓) **one** box to show which device would assign the IPv4 address to the computer.

A Domain name server (DNS) ☐

B Network interface card (NIC) ☐

C Router ☐

D Web server ☐

[1]

(b) Describe the characteristics of an IPv4 address.

.....

.....

.....

.....

.....

.....

.....

..... [4]

3.4 Hardware – Network hardware
QUESTIONS

3 **Five** network terms or definitions are given in the table.

Complete the table by giving the missing term or definition.

Term	Definition
router	....
.....	This address is assigned by the network and used to identify a device on a network.
network interface card (NIC)	....
.....	This address is assigned by the manufacturer and is used to uniquely identify the device.
.....	This can be hardware or software based and filters traffic coming into and out of a network.

[5]

3.4 Hardware – Network hardware
QUESTIONS

5 Complete and annotate the diagram to demonstrate how packet switching is used to transmit data across a network, including the use of routers, from Device A to Device B.

[4]

9 A device can be given an internet protocol (IP) address. This can be an IPv4 or IPv6.

(a) Give **one** similarity between IPv4 and IPv6.

.....

..... [1]

(b) Describe **two** differences between IPv4 and IPv6.

1 .....

.....

.....

.....

2 .....

.....

.....

.....

[4]

(c) A web page is requested using an IP address.

(i) Identify the system that stores a database of uniform resource locators (URLs) and their corresponding IP addresses.

..... [1]

(ii) Identify the software that sends a request to the IP address to obtain the web page data.

..... [1]

8 A computer can have both a Media Access Control (MAC) address and an Internet Protocol (IP) address.

(a) Give **two** similarities between a MAC address and an IP address.

Similarity 1 .....

.....

Similarity 2 .....

.....

[2]

(b) Give **two** differences between a MAC address and an IP address.

Difference 1 .....

.....

Difference 2 .....

.....

[2]

3.4 Hardware – Network hardware
QUESTIONS

10 Many devices have a Media Access Control (MAC) address.

Give **three** features of a MAC address.

Feature 1 .....

.....

Feature 2 .....

.....

Feature 3 .....

.....

[3]

1 Greta has a computer that she uses for schoolwork and leisure.

(a) The computer has the Media Access Control (MAC) address:

00:A0:C9:14:C8:29

(i) Tick (✓) to show whether the MAC address is initially assigned to the computer by the network, the manufacturer or the user.

	Tick (✓)
Network	☐
Manufacturer	☐
User	☐

[1]