SL Unit 3 – Networks

Quiz 1

Question 1			
Objectives:	3.1.1	Exam Reference:	May-15 2

Outline one example of the use of a virtual private network (VPN). [3]

*Award **[1 mark]** for a relevant example and **[2 marks]** for an elaboration.*
Example 1:
A business can let employees work at home / employees who travel a lot/external (non-employee) users;
Accessing the data and services (at the office);
Via secure login;
Example 2:
Using VPN, address is masked;
The location of the user is not known;
May be essential in delicate situations such as political protest groups working from their own country;
Note: *Accept any legitimate reason for needing to be unknown.*

Question 2			
Objectives:	3.1.10	Exam Reference:	May-16 12.a

A college has a high-speed network. The network is accessible to all students and staff through their personal accounts.

The network may be accessed by using desktop computers available in the college. When in the college, users can also use personal laptops to connect wirelessly or dock with an Ethernet cable. When not in the college, users can connect via a virtual private network (VPN) over the internet.

(a) In the given context, distinguish between Ethernet and wireless in terms of **reliability** of transmission. [4]

*Award **[2]** for an explanation of the reliability of wireless.*
*Award **[2]** for an explanation of the reliability of Ethernet*
*Award up to **[4 max].***
***Note:** Do not accept answers relating to security.*

WIRELESS
The reliability of wireless depends
on the strength of the wireless signal/distance from router;
on the topology/shape of the surroundings;
on interference/number of simultaneous connections on an access point;

ETHERNET
Ethernet is more reliable as the strength of the signal is independent from the distance from the router (within the college);
There is no issue with the topology/shape of the surrounding, as long as the user has a connection;
connection depends on condition of cables – no loose or broken cable connections;

Question 3

Objectives:	3.1.15	Exam Reference:	May-17 8

Explain how the use of media access control (MAC) addresses can improve security. [3]

*Award up to **[3 max]**.*
The MAC address identifies a specific device (network card/controller); MAC address checked against list of approved addresses/whitelist If not on list access to network is denied;
Prevents unauthorized access/makes access more difficult/(unless the NIC is cloned)/providing an extra layer to authentication process;
data sent to a specific MAC address can only be accessed on that device;

Question 4

Objectives:	3.1.7	Exam Reference:	Nov-16 8.c

A bookstore sells books online. A customer can select a book, and then enter their name, address and credit card number. This data is stored on the book shop's central computer in a database of customer orders.

Outline the purpose of protocols in transferring this data. [2]

*Award up to **[2 max]**.*
Protocols are sets of rules for transmitting data correctly;
They ensure that data is sent from a customer's computer and received by theshop's computer;
To create a secure transmission of data from the client to the server through the useof the Hypertext Transfer Protocol (HTTPS) *ie* the customer can pay for the bookssecurely (using TLS or SSL).

Question 5			
Objectives:	3.1.3	Exam Reference:	May-15 9.a

Six lawyers and one secretary work together in the same building and are connected via a LAN to a central server. Each has their own workstation.

Outline the concept of the Open Systems Interconnection (OSI) model in communication across a network. [3]

*Award up to **[3 marks max]**.*
The OSI is a standardized system/model for network connection;
Consists of (7) layers;
Each dealing with specific parts of network communication;
For example the physical layer which defines the physical connection;

***Note:** Award **[1 mark]** for the purpose of any of the 7 layers.*
*If candidate lists all 7 layers with no specific example award **[2 marks]** and a further **[1 mark]** if the purpose of at least one layer is given.*