

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD**SECONDARY EDUCATION CERTIFICATE LEVEL
2024 SUPPLEMENTARY SESSION**

SUBJECT:	Information Technology
PAPER NUMBER:	Synoptic – Unit 3
DATE:	4 th November 2024
TIME:	2:30 p.m. to 4:35 p.m.

**THIS PAPER SHOULD BE RETURNED TO THE INVIGILATOR
AFTER THE EXAMINATION.**

For examiners' use only:

Question	1	2	3	4	5	6	7	8	Total
Score									
Maximum	6	8	8	12	12	8	8	8	70

Answer **ALL** questions in the space provided.

Scenario

- Carmen is a family doctor.
- She is currently refurbishing an apartment to turn it into a medical clinic.
- Carmen is aware that having a network is very important for the daily running of the clinic.
- Carmen would like to acquire further information to be able to set up the best network for the clinic.

Question 1

K-1 (6 marks)

a. Define the term network.

(2)

b. State **TWO** purposes of a network, apart from sharing of hardware.

Purpose 1: _____
_____ (1)

Purpose 2: _____
_____ (1)

c. Outline **ONE** use of networks in hospitals and **ONE** different use of networks at home.

Use of networks in hospitals: _____

_____ (1)

Use of networks at home: _____

_____ (1)

6

Question 2**K-2 (8 marks)**

- a. Name **FOUR** different types of networks, apart from Campus Area Network (CAN) and Wide Area Network (WAN).

Network 1: _____ (0.5)

Network 2: _____ (0.5)

Network 3: _____ (0.5)

Network 4: _____ (0.5)

- b. Outline each of the networks you named in Question 2a with respect to their geographical area.

Outline of Network 1: _____

_____ (0.5)

Outline of Network 2: _____

_____ (0.5)

Outline of Network 3: _____

_____ (0.5)

Outline of Network 4: _____

_____ (0.5)

- c. Carmen is wondering what makes a client-server architecture different from peer-to-peer.

Differentiate between client-server and peer-to-peer network architectures with respect to cost and security.

Differentiation with respect to cost: _____

_____ (2)

This question continues on next page.

Differentiation with respect to security: _____

_____ (2)

8

Question 3

K-3 (8 marks)

Similar to other networks, the clinic's network setup will make use of data transmission media.

a. State **TWO** types of data transmission signals, apart from light.

Data transmission signal 1: _____ (1)

Data transmission signal 2: _____ (1)

b. The following are some types of data transmission media.

coaxial cable, microwave frequency, infrared, optical fibre cable

Categorise these data transmission media as wired or wireless. (2)

Wired	Wireless

c. Outline **ONE** limitation, based on distance, for infrared and twisted pair cable data transmission media.

i. Limitation of infrared: _____

_____ (2)

ii. Limitation of twisted pair cable: _____

_____ (2)

8

Question 4**C-1 (12 marks)**

- Carmen is thinking about the type of network she should implement in the clinic.
- She would like to have all computer systems connected together on the same network.
- Computers include two desktop computers at the front desk, and portable computer systems intended for doctors and medical staff.

a. For the above scenario, identify:

i. the appropriate type of network: _____ (2)

ii. the appropriate data transmission: _____ (2)

b. Justify the type of network and data transmission identified in Question 4a.

Justification of type of network: _____

_____ (2)

Justification of data transmission: _____

_____ (2)

c. Justify why Carmen should opt for Wi-Fi rather than infrared as one of the appropriate data transmission medium with respect to speed of transmission and interference:

Justification with respect to speed of transmission: _____

_____ (2)

This question continues on next page.

Justification with respect to interference: _____

12

(2)

Question 5

C-3 (12 marks)

- Carmen started working on the clinic's network plan.
- As shown in Figure 1 below, the location of the modem and the router (which can connect up to 4 wired devices) has been determined.
- The network plan should ensure that the two desktop computers at the front desk will have Internet access.
- Also, people working at the clinic and patients should be able to access the Internet using portable devices.
- Furthermore, Carmen does not want to pass too many data cables within the clinic.

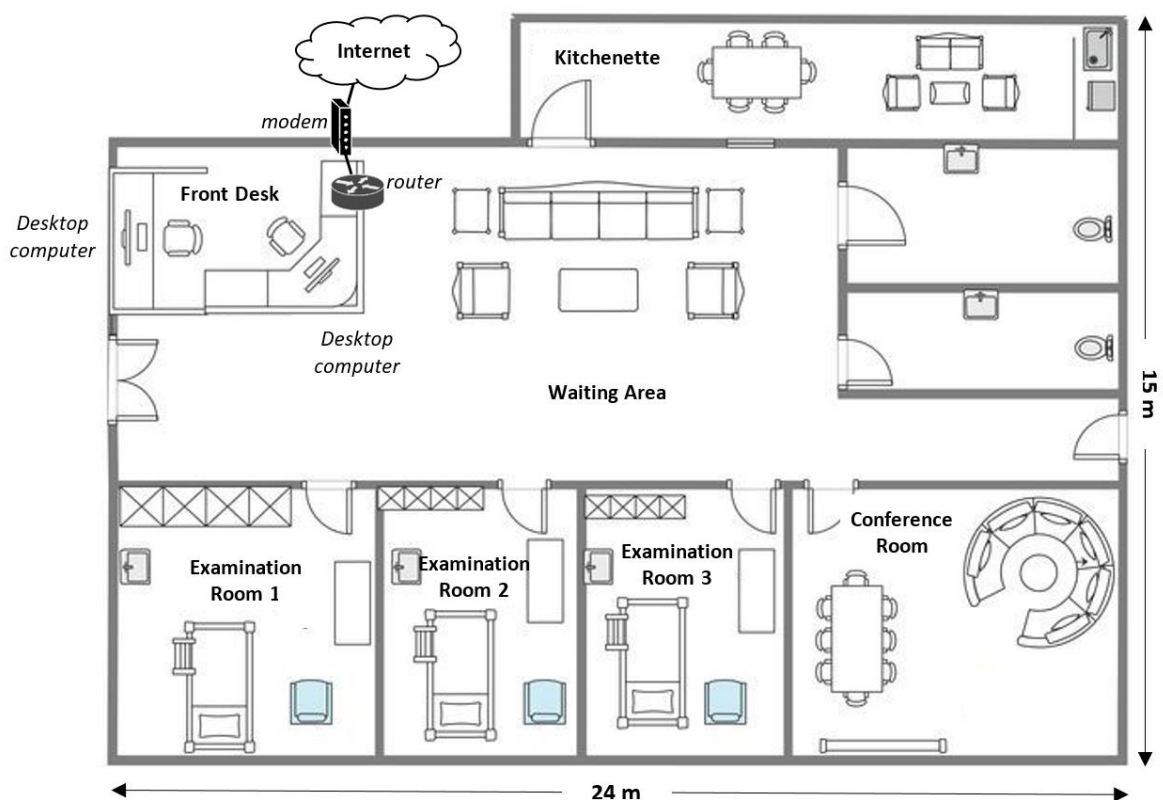






Figure 1: Architectural design for Carmen's clinic
(Source: <https://www.pinterest.com>)

- a. From the following network devices, choose **TWO** devices necessary to complete the wireless aspect of the network setup for the clinic:

Access point	Switch	Repeater	Host
			
(Source: https://conceptdraw.com)	(Source: https://vecta.io)	(Source: https://vecta.io)	(Source: https://vecta.io)

Network device 1: _____ (2)

Network device 2: _____ (2)

- b. On the architectural design presented in Figure 1, illustrate the network plan by:
- placing the network devices chosen in Question 5a in their proper place. You can either draw the symbol of the device or write down its name. If required, the same device can be installed more than once to guarantee an optimal network setup. (2)
 - drawing and properly labelling all the data transmission media to be used in this network setup. Make sure to include the front desk computers as part of your network setup. (2)
- c. i. Justify the **TWO** network devices you chose in Question 5a and the data transmission media included in Question 5b:

Justification of chosen network devices: _____

Justification of data transmission media: _____

(2)

This question continues on next page.

- ii. Justify why the **TWO** network devices you chose in Question 5a were placed in the specific locations on the architectural design in Question 5b:

(2)

12

Question 6**K-8 (8 marks)**

- The desktop computers at the front desk are available for use by anyone working at the clinic including doctors and receptionists.
- Hence, Carmen would like to assign different user account to each employee depending on their role within the clinic.

- a. List **TWO** different local user accounts, apart from guest account.

Local user account 1: _____ (1)

Local user account 2: _____ (1)

- b. Describe the purpose of the **TWO** local user accounts you listed in Question 6a.

Purpose of local user account 1: _____

(1)

Purpose of local user account 2: _____

(1)

c. Outline **TWO** advantages and **TWO** disadvantages of online user accounts.

Advantage 1: _____

_____ (1)

Advantage 2: _____

_____ (1)

Disadvantage 1: _____

_____ (1)

Disadvantage 2: _____

_____ (1)

8

Question 7

K-9 (8 marks)

- At the clinic, sometimes there is the need to share data between different doctors and medical staff.
- Carmen needs to know more about possible file and folder sharing permissions.

a. List **ONE** type of file sharing permission and **ONE** different type of folder sharing permission, apart from read and modify.

File sharing permission: _____ (1)

Folder sharing permission: _____ (1)

This question continues on next page.

b. Outline the following sharing permissions:

i. Read file sharing permission: _____

 _____ (1)

ii. Modify folder sharing permission: _____

 _____ (1)

c. Differentiate between centralised and distributed modes of sharing.

 _____ (4)

8

Question 8

K-10 (8 marks)

- Carmen is concerned about the security of the network.
- She wants to make sure that the clinic's network is protected from any possible threats.

a. List **FOUR** network security threats, apart from phishing.

Network security threat 1: _____ (0.5)

Network security threat 2: _____ (0.5)

Network security threat 3: _____ (0.5)

Network security threat 4: _____ (0.5)

- b. State **FOUR** possible protection measures which can be used to protect networked devices, apart from security updates and sand boxing.

Protection measure 1: _____
_____ (0.5)

Protection measure 2: _____
_____ (0.5)

Protection measure 3: _____
_____ (0.5)

Protection measure 4: _____
_____ (0.5)

- c. Outline **FOUR** protection measures which can be used in a wireless network setup, apart from hiding the SSID.

Wireless protection measure 1: _____

_____ (1)

Wireless protection measure 2: _____

_____ (1)

Wireless protection measure 3: _____

_____ (1)

Wireless protection measure 4: _____

_____ (1)

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