L-Università ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD

**SECONDARY EDUCATION CERTIFICATE LEVEL
2022 SUPPLEMENTARY SESSION**

SUBJECT:	**Information Technology**
PAPER NUMBER:	Synoptic – Unit 3
DATE:	1st November 2022
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	8	8	8	12	70

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

Scenario

- 'KK Hotels' is a hotel chain.
- It has several hotels across Malta including Mosta, Sliema and Qrendi.
- The management of the hotel chain are currently working on opening a new hotel in Gozo.
- They are currently discussing and planning the network system for this new hotel.
- The management would like to gain more knowledge on networking.

Question 1   **K-1 (6 marks)**

a) Define the term network.

_____

_____

_____ (2)

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

Purpose 1: _____

_____ (1)

Purpose 2: _____

_____ (1)

c) Outline **ONE** use of networks in hotels and **ONE** use of networks in cars.

_____

_____

_____

_____

_____

_____

_____

_____ (2)

6

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

a) Name **FOUR** different types of networks, apart from Local Area Network (LAN) and Personal Area Network (PAN).

Network 1: _____ (0.5)

Network 2: _____ (0.5)

Network 3: _____ (0.5)

Network 4: _____ (0.5)

b) Outline each of the networks named in Question 2a with respect to the geographical area they cover.

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) The management of the hotel chain are not aware of the differences between client-server and peer-to-peer network architectures.

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

This question continues on next page.

Differentiation with respect to Network Management: _____

_____

_____

_____

_____

_____ (2)

Differentiation with respect to Security: _____

_____

_____

_____

_____ (2)

8

Question 3   K-3 (8 marks)

- The management of 'KK Hotels' need to decide which data transmission media should be used for the new hotel.
- They want to make sure that data is transmitted within the new hotel as well as between the chain of hotels in an efficient and effective way.

a) State **TWO** types of data transmission signals.

Data transmission signal 1: _____ (1)

Data transmission signal 2: _____ (1)

b) The following are different data transmission media being considered by 'KK Hotels'.

twisted pair cable,   infrared,   radio frequency,   coaxial cable

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

Wired	Wireless

DO NOT WRITE ABOVE THIS LINE

c) Outline **ONE** limitation, based on distance, for any **TWO** data transmission media categorised in Question 3b.

   i. Data transmission medium: _____

      Limitation of data transmission medium: _____

      _____

      _____ (2)

   ii. Data transmission medium: _____

      Limitation of data transmission medium: _____

      _____

      _____ (2)

8

Question 4   C-1 (12 marks)

- The management of 'KK Hotels' are currently discussing which type of network setup should be implemented for the different needs of the new hotel.
- The director of the new hotel would like to connect his smartwatch to the laptop when at his office.
- He needs data between the devices to be transferred as fast as possible while he roams about in the office.

a) For the above scenario, identify:

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

   ii. the appropriate type of data transmission: _____ (2)

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

   Justification of type of network: _____

   _____

   _____

   _____

   _____ (2)

This question continues on next page.

Justification of data transmission: _____

_____

_____

_____

_____ (2)

c) The director of the new hotel is considering connecting the smartwatch and the laptop through Bluetooth rather than infrared.

Justify why Bluetooth is the appropriate data transmission medium for this scenario with respect to speed of transmission and interference:

Justification with respect to speed of transmission: _____

_____

_____

_____

_____ (2)

Justification with respect to interference: _____

_____

_____

_____

_____

_____ (2)

12

Question 5   K-6 (8 marks)

Different CISCO symbols were shown to the management of 'KK Hotels' to identify the network devices which will be used to set up the hotel's network.

a) Identify the network device represented by each CISCO symbol presented in the table below.

Table 1: CISCO Devices Symbols

	Symbol	Device Name
Device 1	(Source: https://vecta.io)	_____
Device 2	(Source: https://vecta.io)	_____
Device 3	(Source: https://vecta.io)	_____
Device 4	(Source: https://conceptdraw.com)	_____

(2)

b) State the use of each network device identified in Question 5a.

Use of Device 1: _____

_____ (0.5)

Use of Device 2: _____

_____ (0.5)

Use of Device 3: _____

_____ (0.5)

Use of Device 4: _____

_____ (0.5)

This question continues on next page.

c) The features of the network switches which will be used in the new hotel are presented in the below screenshot:

HARDWARE FEATURES	
Standards and Protocols	IEEE 802.3i, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3x
Interface	48 10/100/1000Mbps RJ45 Ports (Auto Negotiation/Auto MDI/MDIX)
Network Media	10BASE-T: UTP category 3, 4, 5 cable (maximum 100m) 100BASE-TX/1000BASE-T: UTP category 5, 5e or above cable (maximum 100m)
Physical Security Lock	No
Power Supply	100-240VAC, 50/60Hz
Dimensions (W x D x H)	17.32*8.7*1.73 in.(440*220*44 mm)
Mounting	Rack Mountable
Max Power Consumption	32.29W(220V/50Hz)
Max Heat Dissipation	110.17BTU/h

Figure 1: Features of the TP-Link switch
(*Source: https://www.tp-link.com/*)

Based on the features provided in Figure 1, outline the following specifications:

i. Number of Ports: _____

_____

_____ (2)

ii. Power Source: _____

_____

_____ (2)

8

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

- Every employee working at any hotel forming part of the 'KK Hotels' chain is assigned a user account.
- The assigned account depends on the employee's role and responsibility.

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 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: _____

_____
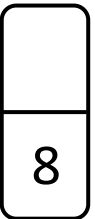
_____

_____ (1)

Advantage 2: _____

_____

_____

_____ (1)

Disadvantage 1: _____

_____

_____

_____ (1)

Disadvantage 2: _____

_____

_____

_____ (1)

8

Question 7   **K-10 (8 marks)**

- The management of 'KK Hotels' know that any networked system is exposed to risks and threats.
- They want to try to identify mechanisms which can be used to mitigate such risks.

a) List **FOUR** network security threats, apart from hacking.

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 installing security updates and using anti-malware software.

Protection Measure 1: _____

_____ (0.5)

Protection Measure 2: _____

_____ (0.5)

Protection Measure 3: _____

_____ (0.5)

Protection Measure 4: _____

_____ (0.5)

c) Some areas of the new hotel will have a wireless network which will be used by employees only.

Outline **FOUR** protection measures which can be used in a wireless network setup, apart from setting WPA and WPA2.

Wireless Protection Measure 1: _____
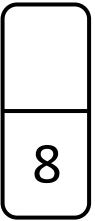
_____

_____ (1)

Wireless Protection Measure 2: _____

_____

_____ (1)

Wireless Protection Measure 3: _____

_____

_____ (1)

Wireless Protection Measure 4: _____

_____

_____ (1)

8

Question 8   C-5 (12 marks)

- Security measures for the wired network of the new hotel have been planned.
- One of the managers of 'KK Hotels' stated that to reduce costs, the wired network of the new hotel should be left unsecured.

a) State **FOUR** repercussions of having an unsecured wired network in this scenario.

Repercussion 1: _____ (1)

Repercussion 2: _____ (1)

Repercussion 3: _____ (1)

Repercussion 4: _____ (1)

b) Explain each repercussion stated in Question 8a.

Explanation of Repercussion 1: _____

_____

_____

_____ (1)

Explanation of Repercussion 2: _____

_____

_____

_____ (1)

Explanation of Repercussion 3: _____

_____

_____

_____ (1)

This question continues on next page.

Explanation of Repercussion 4: _____

_____

_____

_____ (1)

c) Security updates and anti-malware are two possible protection measures used to secure the network of 'KK Hotels'. Justify each protection measure, based on ease of installation and effectiveness.

Justification of security updates with respect to ease of installation:

_____

_____

_____

_____ (1)

Justification of security updates with respect to effectiveness:

_____

_____

_____

_____ (1)

Justification of anti-malware with respect to ease of installation:

_____

_____

_____

_____ (1)

Justification of anti-malware with respect to effectiveness:

_____

_____

_____

_____ (1)

12