



SUBJECT: **Information Technology**
DATE: 23rd June 2021
TIME: 9:00 a.m. to 12:05 p.m.

Directions to Candidates

Workings are considered as part of the answer and must be shown.

SECTION A: COMPUTING PRINCIPLES

Answer Question 1 and any other FOUR questions from this section.

1. This question is compulsory.

The National Council for the Maltese Language has developed a new website where users can follow Maltese courses at various levels and a spell checker. The website was created with the aim to promote the Maltese language.

- Outline **TWO** bandwidth considerations in order to ensure that the website operates optimally for all users. (2)
- Explain **THREE** items that should be part of the website test plan. (3)
- What is the purpose of the HTML META tags? Provide **ONE** practical use of the META tag. (2)
- The website also makes extensive use of hyperlinks. What is the purpose of hyperlinks?(2)
- Identify **ONE** primary key and **ONE** foreign key from the tables shown in Figure 1. (2)

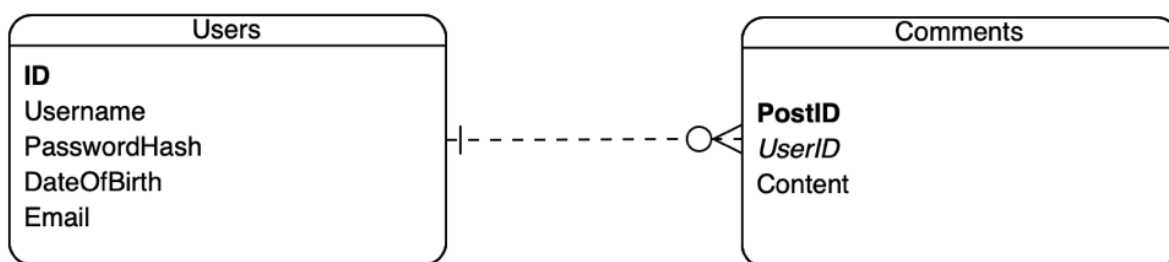


Figure 1

- What is the type of relationship between the Users and the Comments tables? (1)
- What is the purpose of an Entity Relationship diagram? (1)
- Identify the appropriate field types for the Username and DateOfBirth attributes. (2)
- Outline **THREE** validation checks that can be implemented in order to ensure data consistency. (3)

(Total: 18 marks)

Answer any FOUR questions from questions 2, 3, 4, 5, 6 and 7.

2. In December 2020 it was reported that SolarWinds, an American software company, had its security systems compromised. This had a detrimental effect on thousands of its customers amongst which are sensitive US government departments. It is currently estimated that the cost of this incident will be well over \$90 million.

- a. Describe **TWO** ways in which governments can make use of ICT in order to provide better services to their citizens. (2)
- b. Briefly define **TWO** categories of illegal practices associated with computer-related crime. (2)
- c. Provide an outline of what SolarWinds could have used as a means to reduce the effects of such a computer crime. (1)
- d. Outline **THREE** rights of the data subjects exposed by the SolarWinds system security issue. (3)

(Total: 8 marks)

3. A not-for-profit organisation that aims to help abandoned animals is looking to purchase a new computer.

- a. Which storage system would you recommend when considering that they want to keep costs as low as possible? (1)
- b. The computer they identified comes equipped with an operating system which comes at a cost of €150. Describe **TWO** functions of the operating system. (2)
- c. Explain how it might be possible for this organisation to legally avoid paying the €150 operating system fee. In your explanation provide a valid example. (1, 1)
- d. Single program, multitasking and multiprogramming are different types of operating systems. Briefly explain **each** type of operating system. (3)

(Total: 8 marks)

4. A local company has recently overhauled their network in order to better cope with the work from home initiatives which they have implemented. Since implementing the changes, they have noticed a marked increase in the number of complaints received related to the network.

- a. The most pressing complaint is that the employees cannot connect to the mail server which is operating on port 25. Which network device could be blocking everyone's access to port 25? (1)
- b. Which protocol is used to send emails? (1)
- c. Provide **TWO** reasons why the network administrator is insisting of making use of IMAP rather than POP. (2)
- d. The Filezilla application has been installed on the computers of all employees. What is the purpose of this application and which protocol does it make use of? (2, 1)
- e. If the employees working from home have no Internet connectivity, who should they contact first for support? (1)

(Total: 8 marks)

5. The development of a new software is a multi-year endeavour which goes through a number of stages.

a. During the analysis stage, which **TWO** tools can be used in order to gather information? Your answer should provide a scenario when the use of such a tool is preferred. (4)

b. Explain **FOUR** concepts that should be part of the design stage in system development. (4)

(Total: 8 marks)

6. An auditing company, has decided to provide laptops for all of its employees so that they are able to work from out-of-office including at clients' premises or from home.

a. Mention and define **TWO** other categories of computers which could have been provided to the employees instead of laptops (4)

The company has stated that all reports conducted out-of-office should be saved on either optical-based storage devices or flash-memory.

b. Are optical-based storage devices and flash drives considered as being **primary** or **secondary** storage devices? (1)

c. Mention **ONE** advantage and **ONE** disadvantage of optical based storage devices (2)

d. Define flash-memory (1)

(Total: 8 marks)

7. Almost all managers of a local business company are in agreement that more transactions should be conducted online. However, one of the managers is totally against such a proposal due to a concern about Internet security problems.

a. Mention and explain **TWO** possible types of Internet based fraud. (2)

b. Define the term malware. Subsequently, identify **TWO** examples of malware in this scenario. (2, 2)

c. Mention **ONE** solution **for each** of the **TWO** examples of malware mentioned in Part b. (2)

(Total: 8 marks)

Please turn the page.

SECTION B: HUMAN COMMUNICATION AND BUSINESS ORGANISATION

Answer Question 1 and ONE other question from this section.

1. This question is compulsory.

A local gym wants to update their clients' database. Thus, they have sent an email to all their members asking them to reply back with their updated personal information. However, they have noted that a huge chunk of their members did not reply. One of the employees suggested that this might be because different individuals prefer different type of communication.

- a. What is communication? (1)
- b. Discuss how electronic communication is affecting businesses. (1)
- c. Mention **TWO** other Internet utilities apart from electronic communication which could have been utilised as a communication tool. (1)
- d. Discuss **TWO** advantages and **TWO** disadvantages of making use of the Internet as a communication tool. (4)
- e. Apart from written communication, such as in the case of electronic communication other types of communication can be utilised. State and explain **TWO** other types of communication. (2)
- f. Define the term 'help desk'. (1)

(Total: 10 marks)

Answer ONE question from 2 and 3.

2. A local company has decided to change the way the company operates to become more efficient.

- a. Mention **THREE** factors which might have led to such a change. (3)
- b. Discuss **FOUR** factors which should be considered when managing change. (4)
- c. Provide ideas how to overcome resistance to change by current employees. (3)

(Total: 10 marks)

3. A newly established company is trying to determine the most ideal organisational structure for the company to be successful in its operations.

- a. Mention **THREE** ways how a company might be departmentalised. (3)
- b. Describe **THREE** different organisational charts which can be utilised to highlight the structure of an organisation. (3)
- c. Compare and contrast the role of a Chief Information Officer (CIO) and that of a Chief Security Officer (CSO). (4)

(Total: 10 marks)