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SUBJECT:	<b>Information Technology</b>
DATE:	12 <sup>th</sup> October 2021
TIME:	4:00 p.m. to 7:05 p.m.

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**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.**

An animal shelter has commissioned a developer to create a database for the animals under their care. The developer intends to make use of databases as these offer several advantages for data storage and data retrieval and can also be connected to the Internet and the shelter's website.

- Explain briefly the use of a key field in a database. Provide a valid key field for such a database. (2)
- What is the purpose of a foreign key in a database? Provide a valid foreign key for such a database. (2)
- Identify **TWO** fields (not mentioned in parts a and b), along with the appropriate field type, that would typically be present in such a database. (4)
- Provide an example of how referential integrity can be of benefit for this database. (1)
- Draw a sitemap that can be used as a basis for the creation of the shelter's website. The website needs to have at least **SIX** different pages. (3)
- Provide an explanation of **THREE** design principles to be considered when designing this website. (3)
- Provide **THREE** components of a valid test plan for this website. (3)

**(Total: 18 marks)**

***Please turn the page.***

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

2. A local organisation is looking into carrying out data analytics in order to study possible patterns that might emerge.
- Identify **TWO** advantages and **TWO** disadvantages of including indirect data in their analytics? (4)
  - The direct data stored by the company include personal and private information. Explain **TWO** principles of the data protection act in Malta and **ONE** scenario where an exemption from this law would be granted. (3)
  - How should personal and private data be stored on the company's servers? (1)

**(Total: 8 marks)**

3. Losses to romance scams reached a record \$304 million in 2020. In similar news, the cost of piracy is expected to rise to \$52 billion by the year 2022.
- Apart from fraud, explain **THREE** other categories of illegal practices. (3)
  - How is piracy defined in relation to software and online video? (2)
  - Explain with the use of examples, how piracy is different from plagiarism. (2)
  - What is meant by open-source software? (1)

**(Total: 8 marks)**

4. The development of a new software system is a complex task that usually spans a number of years to complete, and which requires substantial investment.
- Explain the importance of a feasibility study when developing new software systems. (1)
  - List and explain **THREE** factors that need to be considered during the feasibility study. (3)
  - Explain **TWO** diagrams and notations that are useful during system analysis. (2)
  - Part of the process of developing new software is defining the system and information requirements on the new system. Provide **TWO** examples of items that should be taken into consideration during this stage. (2)

**(Total: 8 marks)**

5. Preparing an online shopping experience requires the use of various technologies. Most notably web development technologies and databases. A local startup has recently acquired funds to move all of their sales online. However, they have no online presence at the moment.
- What is the purpose of the Internet registries in such a scenario? (1)
  - Early on during the process, the local startup has been asked for their DNS hostnames. Explain the importance of having DNS entries. (1)
  - How does JavaScript tie in with HTML and CSS when developing websites? (1)
  - In order to keep their customers updated, the local startup was looking at making use of Really Simple Syndication (RSS). Explain **ONE** advantage and **ONE** disadvantage of RSS. (2)

- e. What would be a valid alternative to RSS? (1)
- f. The local startup have been told to acquire or rent a web server. Why is a webserver required? (1)
- g. Which protocol is used by the web server? (1)

**(Total: 8 marks)**

6. The WWW is only a small part of the Internet as a whole. The Internet is made up of many other utilities.
- a. Mention **TWO** such utilities. (2)
  - b. Explain **both** utilities mentioned in part a. (2)
  - c. For **each** utility mentioned in part a, provide **ONE** example. (2)
  - d. Choose **ONE** of the utilities mentioned in part a and provide **ONE** advantage and **ONE** disadvantage. (2)

**(Total: 8 marks)**

7. Multiple computer systems are available, each of which is used in particular scenarios to cater for various requirements. A meteorological company would like to buy new computer systems which are to be utilised for weather forecasting.
- a. Which types of computer systems are best utilised in such a scenario? (2)
  - b. Explain **TWO** other types of computer systems (different from that mentioned in part a). (4)
  - c. For **each** computer system mentioned in part b, list **ONE** scenario where it is usually utilised. (2)

**(Total: 8 marks)**

## **SECTION B: HUMAN COMMUNICATION AND BUSINESS ORGANISATION**

**Answer Question 1 and ONE other question from this section.**

### **1. This question is compulsory**

An accounting firm is trying to assess the existent communication mechanisms of the organisation (both internal and external). For the purpose of this assessment, only downward communication was considered in relation to internal communication techniques.

- a. What does the term downward communication refer to? (1)
- b. How does it differ from upward communication? (1)
- c. Mention **THREE** methods which can be utilised for downward communication purposes. (3)

***Please turn the page.***

- d. The managers of all departments in the firm encourage lateral communication. Define this term and explain its importance. (2)
- e. Why is external communication essential in such a firm? (1)
- f. Mention **TWO** mechanisms which might be utilised to spread such information. (2)

**(Total: 10 marks)**

**Answer ONE question from 2 and 3.**

- 2. A new computer graduate has decided to become a self-employed entrepreneur owning and running his own business. Thus, he opened a new company named CompTech Ltd.
  - a. What is this type of business organisation called? (1)
  - b. Mention and define **THREE** other types of organisations (different from the answer given for part a). (3)
  - c. For **each** of the three organisation types mentioned in part b, list **ONE** advantage. (3)
  - d. For **each** of the three organisation types mentioned in part b, list **ONE** disadvantage. (3)

**(Total: 10 marks)**

- 3. The 'InsuranceOfYourChoice' company is currently made up of the sales, finance, administration and human resources departments. Recently, the management of the company has agreed that it is best to have a dedicated marketing department.
  - a. Why is the inclusion of a new, dedicated marketing department beneficial? (1)
  - b. Provide a brief description of the functionalities of the existent departments i.e:
    - Sales
    - Finance
    - Administration
    - Human resources. (4)
  - c. Explain briefly what should be the work carried out by the new marketing department. (1)
  - d. Identify **TWO** personnel who might be employed in this new marketing department and briefly explain their main role and responsibilities. (4)

**(Total: 10 marks)**