

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD
UNIVERSITY OF MALTA, MSIDA

MATRICULATION CERTIFICATE EXAMINATION
ADVANCED LEVEL
SEPTEMBER 2012

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	I
DATE:	4th September 2012
TIME:	9.00 a.m. to 12.00 noon

DIRECTIONS TO CANDIDATES

A total of six questions must be attempted; three from Section A and another three from Section B.

SECTION A: INFORMATION SYSTEMS

Answer *the first question in this section* and any other *two* questions.

QUESTION A1

This question is compulsory. Answer all parts.

- a) This part is on Computer Systems.
- Define the basic components of a computer system.
 - Use a diagram to show how the components defined in part (i) are connected together.
 - Identify the main categories of computers currently in existence together with their characteristic use. **[6 marks]**
- b) This part is on the Microprocessor.
- Give an overview of a typical processor identifying the different parts and how they are linked.
 - Identify **two** functions of the microprocessor.
 - Name the **two** main types of memory that are currently in use in the context of the microprocessor. **[6 marks]**
- c) This part is on Input and Output Devices.
- Identify **two** input devices and a typical usage scenario for each.
 - Identify **two** output devices and a typical usage scenario for each. **[4 marks]**
- d) This part is on Storage Devices.
- Identify the **two** types of storage devices and mention an associated characteristic.
 - Name **two** storage devices from any of the types identified in Part (i) together with an associated usage scenario. **[4 marks]**

Answer ANY TWO of questions A2, A3 and A4

QUESTION A2

This question is on Computer Network Security.

- a) Explain why there is a security issue on a network.
How are network users involved with such security issues? **[5 marks]**
- b) Define *access privileges* and *access control*.
Identify and explain one access control level. **[5 marks]**
- c) Identify **two** ways or practices to secure a network.
Give an example of how such security is implemented. **[5 marks]**

QUESTION A3

This question is on Processing Modes.

- a) Distinguish between *batch processing* and *interactive processing*.
Name **one** other processing mode. **[5 marks]**
- b) List the main stages of a batch processing system. **[5 marks]**
- c) Identify **three** criteria for choosing a specific processing mode.
Give a practical example of any **one** of the criteria identified. **[5 marks]**

QUESTION A4

This question is about Project Management.

- a) Why is project management important?
Identify **three** characteristics of a project. **[5 marks]**
- b) Identify **five** tasks of a project manager. **[5 marks]**
- c) What is a project review?
Give **three** outcomes from such a review. **[5 marks]**

SECTION B: HUMAN COMMUNICATION & BUSINESS ORGANISATION

Answer *the first question in this section* and any other *two* questions.

QUESTION B1

This question is compulsory. Answer all parts.

- i) Briefly explain any *one* type of communication of your choice. **[5 marks]**
- ii) Differentiate between a *Sole Trader* and a *Private Limited Company*. **[5 marks]**
- iii) Compare the differences between *open systems* and *closed systems* used in typical organizations. **[5 marks]**
- iv) Distinguish between *centralised* and *decentralised* organizations. **[5 marks]**

Answer ANY TWO of questions B2, B3 and B4

QUESTION B2

Discuss in detail the advantages and disadvantages of verbal and written communication. **[15 marks]**

QUESTION B3

Consider the need for support within the organisation and to external customers. Describe the characteristics of a '*help desk*' and *help desk* software that may be in use today. What is the role of '*traditional*' documentation such as manuals? **[15 marks]**

QUESTION B4

Mention the advantages and disadvantages of the internet as a communication tool. Also mention **four** internet utilities that can be used as human communication tools. **[15 marks]**

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MATRICULATION CERTIFICATE EXAMINATION
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SEPTEMBER 2012

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	II
DATE:	5th September 2012
TIME:	9.00 a.m. to 12.00 noon

DIRECTIONS TO CANDIDATES

A total of six questions must be attempted; three from Section A and another three from Section B.

SECTION A: SOFTWARE

Answer *the first question in this section* and any other *two* questions.

QUESTION A1

This question is compulsory. Answer all parts.

- a) This part is on Database Systems.
- Describe the nature and purpose of a database system.
 - Compare a traditional file system to a database system.
 - Name **two** advantages/disadvantages of each. **[6 marks]**
- b) This part is on Database Management Systems.
- Highlight the structure and features of a DBMS.
 - Where is the information about the database stored in a DBMS?
 - Who should be in charge of a DBMS? **[6 marks]**
- c) This part is on the Conceptual Model.
- Does the design of the conceptual model depend on the type of DBMS to be used?
 - Name the **three** elements that are used to build a picture of the data requirements. **[4 marks]**
- d) This part is on Normalisation.
- What is the purpose of normalisation?
 - Name **one** of the normal forms and describe the state of the table in this particular form. **[4 marks]**

Answer ANY TWO of questions A2, A3 and A4

QUESTION A2

This question is on Generic Software.

- a) What is a word processing package?
Identify and briefly explain **three** features normally found in a word processing package. **[5 marks]**
- b) Which generic software is employed to create worksheets to represent data in columns and rows?
Identify and briefly explain **four** features that are normally found in such generic software. **[5 marks]**
- c) State the type of generic software would normally be used for:
i. looking for information about a digital camera to purchase;
ii. passing on a document to a friend abroad;
iii. writing the lyrics of a song;
iv. showcasing your work to a group of people;
v. keeping track of all the products at a shop. **[5 marks]**

QUESTION A3

This question is on Shared and Distributed Database Systems.

- a) What is a *shared database system*?
Name **three** characteristics of such a system. **[5 marks]**
- b) Define a *distributed database system*.
Identify **three** advantage and/or diadvantages of such a system. **[5 marks]**
- c) Give an example of an organisation that makes use of a shared or distributed database system.
Give **five** reasons for this organisation to hold its data in this way? **[5 marks]**

QUESTION A4

This question is on Internet Utility Software

- a) How does *client-server* technology work?
Which hardware and software is required for this technology to function properly? **[5 marks]**
- b) Name **five** Internet utility software. **[5 marks]**
- c) Which of the utility software named in Part (b) would be more effective if available over a mobile device? Explain? What additional software and/or services are required to render Internet-based utilities mobile? **[5 marks]**

SECTION B: PROGRAMMING TECHNIQUES AND SYSTEM DEVELOPMENT

Answer *the first question in this section* and any other *two* questions.

QUESTION B1

This question is compulsory. Answer all parts.

- a) This part is on Programming Languages.
- i. Name a *natural* and a *formal* language.
 - ii. Identify **two** of the major types of programming languages.
 - iii. Name **two** language translators. **[6 marks]**
- b) This part is on the Imperative Paradigm.
- i. Identify and explain **two** characteristic of the Imperative paradigm.
 - ii. Give **two** examples of Imperative programming languages. **[4 marks]**
- c) This part is on Object-Oriented Paradigm.
- i. Identify and explain **two** characteristics of the Object-oriented paradigm.
 - ii. Give **two** examples of Object-oriented programming languages. **[4 marks]**
- d) This part is on the Programming Paradigms and Problem Solving.
- i. Name **two** more programming paradigms apart from those mentioned in Parts (b) and (c).
 - ii. Give **one** characteristic and one example of one of the paradigms named in Part (i)
 - iii. Write and describe an algorithm for sorting a simple data set. **[6 marks]**

Answer ANY TWO of questions B2, B3 and B4

QUESTION B2

This part is on System and Information Requirements

- a) Why are system and information requirements gathered?
Name **three** methods employed to gather these details. **[5 marks]**
- b) Identify **three** kinds of system/information requirements that are gathered.
Name **two** options that can be used for implementing the system. **[5 marks]**
- c) What type of diagram is created to represent the information about data within the system?
Create a diagram to represent how the following data is processed in a library when a user would like to borrow a book.
The user enters the ID, the system checks the database to verify that this is an authentic user and calculates the due date for the book that is then entered into the database. **[5 marks]**

QUESTION B3

This part is on Error Types and Debugging.

- a) Explain the process of debugging.
Name **three** debugging utilities that are normally found in an integrated programming development environment. **[5 marks]**
- b) Identify **three** error types.
Give an example of **two** of the error types identified. **[5 marks]**
- c) A programmer places a number of unplanned and unspecified output statements onto the screen in key points of a program that is being developed.
i. Is this considered as debugging?
ii. What is the purpose for these statements?
iii. Will they form part of the final system? **[5 marks]**

QUESTION B4

This part is on Analysis, Problem Identification, Investigation and Feasibility Study.

- a) What is the purpose of the analysis stage?
Name **three** findings that result from this stage. **[5 marks]**
- b) What is the purpose of identifying the problem?
Name **three** reasons for introducing a new computerised system. **[5 marks]**
- c) What is the purpose of the feasibility study?
Name **three** feasibility factors that need to be considered. **[5 marks]**