MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

UNIVERSITY OF MALTA, MSIDA

MATRICULATION EXAMINATION
ADVANCED LEVEL
SEPTEMBER 2016

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	I
DATE:	2nd September 2016
TIME:	9.00 a.m. to 12.05 p.m.

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) Explain each of the following terms:
    i. Gateway;
    ii. Data Validation;
    iii. Digital Image Processing;
    iv. Fibre Optic.   **[8 marks]**

b) Give *one* practical example for each of the following in the context of a small business:
    i. CCTV;
    ii. Offsite Backups;
    iii. Permissions and Restrictions.   **[6 marks]**

c) List and briefly describe any *two* processing modes.   **[4 marks]**

d) List any *two* features of *Cloud Computing*.   **[2 marks]**

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2
This question is about *Internet, Communication and System Applications.*

a)   Name any ***two*** protocols commonly used on the Internet. **[2 marks]**

b)   What is the difference between *wired* and *wireless* communication. Give ***three*** disadvantages and ***three*** advantages for each. **[8 marks]**

c)   Explain the difference between *simplex* and *duplex* communication. **[4 marks]**

d)   List and explain any ***two*** Internet related security problems. **[4 marks]**

e)   Briefly explain what is an *Expert System.* **[2 marks]**

QUESTION A3
This question is about *Information Systems and Data Security.*

a)   Explain each of the following acronyms:
       i.   OCR;
      ii.   EDI;
    iii.   ALU;
    iv.   ASCII;
     v.   ROM. **[10 marks]**

b)   Outline any ***three*** advantages of using *tablets* as a learning aid. **[3 marks]**

c)   List and briefly explain the function of any ***two*** main components of a microprocessor. **[2 marks]**

d)   Define the terms *interference and noise* in communication systems. **[2 marks]**

e)   Distinguish between *data loss* and *data recovery*. **[3 marks]**

QUESTION A4
This question is about *Information Systems and Tools.*

a)   Briefly list and explain any ***three*** features of *Business Intelligence Software.* **[3 marks]**

b)   What is *RFID*? **[2 marks]**

c)   Explain why organisations have codes of practice. List and briefly explain any ***two*** ethical issues. **[3 marks]**

d)   What is the difference between *GUI* and *CLI?* Give a practical example for each interface where one is preferred to the other. **[4 marks]**

e)   Explain what is *Rapid Application Development* (RAD). List and briefly explain any **three** features of RAD.   **[4 marks]**

f)   Explain how an *expert system* can help engineers design better aircrafts. Give any **two** examples.   **[4 marks]**

SECTION B: HUMAN COMMUNICATIONS & BUSINESS ORGANISATION

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

QUESTION B1
This question is compulsory. Answer all parts.

a)   E- Government services are supposed to offer several benefits. Briefly discuss and explain these benefits. Give **one** example of an E-Government service.   **[3 marks]**

b)   Briefly explain the importance of using ICT for science. Give any **two** examples.   **[3 marks]**

c)   Briefly list and explain any **two** health and safety issues arising from computer use.   **[4 marks]**

d)   Briefly list and explain any **two** issues that need to be considered when creating IS strategies in Business Organisations.   **[4 marks]**

e)   Why is it important to use licensed software or have a software licence? Explain briefly.
                                                                                        [1 mark]

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2

Discuss the importance of E-Learning in modern education. Discuss any **three** advantages and **three** disadvantages of E-Learning.   **[15 marks]**

QUESTION B3

Several security risks are associated with information. Discuss this statement and explain any **five** of these possible risks.   **[15 marks]**

QUESTION B4

Change in business organisation takes place quite often. What is change? Describe which factors lead to change and how change can be managed.   **[15 marks]**

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)   What is HTML? Where is it used? **[2 marks]**

b)   In the context of databases, state the importance of *portability*. **[2 marks]**

c)   Why is *compatibility with existing software* an important criteria to evaluate software?
[2 marks]

d)   Mention *three* responsibilities commonly associated with the role of a DBA. **[3 marks]**

e)   Describe the following terms:
   i.   Record;
   ii.   Data Query Language;
   iii.   Normalisation. **[6 marks]**

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2
This question is about the *Internet.*

a)   Briefly describe *three* utilities found on the Internet.   **[6 marks]**

b)   Suggest *three* ways how a user can prevent *Internet based fraud.*   **[6 marks]**

c)   Suggest why protocols such as *FTP* may be blocked in public access areas such as schools and libraries.   **[3 marks]**

QUESTION A3
This question is about *Databases.*

a)   What is *a data dictionary?*   **[2 marks]**

b)   Explain the use of *relationships* within a relational database.   **[2 marks]**

c)   Briefly explain *two* methods how data can be inputted in a database.   **[4 marks]**

d)   Differentiate between *Hierarchical* and *Network* data model.   **[4 marks]**

e)   What is an *E-R diagram*? Provide an example.   **[3 marks]**

QUESTION A4
This question is about *Software.*

a)   Explain the following terms:
    i.   Communication Software;
    ii.   Benchmark Test.   **[4 marks]**

b)   What is a *translator? Give an example to substantiate your answer.*   **[2 marks]**

c)   Write down *three* examples of an *Operating System* (OS).   **[3 marks]**

d)   List *three* components of the *Operating System* (OS).   **[3 marks]**

e)   Explain the term *error handling.*   **[3 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)   Draw a flowchart for the following code:

```
1.          public class SDemo {
2.              public static void main(String[] args)  {
3.                  System.out.printIn("What do you wish to eat?");
4.                  Scanner scan = new Scanner (System.in);
5.                  String choice = scan.nextLine ();
6.                  int cost = 0;
7.
8.                  if (choice.equals("Hot Dog"))
9.                     cost = 40;
10.                 else if (choice.equals("Burger"))
11.                    cost = 80;
12.                 else if (choice.equals("Pizza"))
13.                    cost = 90;
14.             }
15.     }
```

[6 marks]

b)   Explain the following terms with reference to the code in B1 part (a).
   i.   Subroutines;
   ii.   Control Structures.   **[4 marks]**

c)   Explain the following SQL statement

SELECT * FROM Customers WHERE Country='Malta';

[3 marks]

d)   Explain how you can modify the statement in B1 part (c) to retrieve 35-year old customers (assuming that the age attribute exists in table Customers).   **[2 marks]**

e)   Construct a sitemap (Organigram) of the following scenario:
      The Home page comprises of 4 pages: Galleries, Links, Contact and Information. The Galleries page has 3 subsections named Photography, Art, Other.   **[5 marks]**

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2
This question is about *Practical Implementation of System Development*.

a)   Outline and explain the difference between a *DFD* and a *class diagram*.   **[6 marks]**

b)   "Analysis is fundamental to determine a good design." State and explain whether the statement is correct.   **[4 marks]**

c)   There are *three* ways how you can implement a new system. Provide a practical example how you can use each of them when having to switch between a manual book keeping service and an automated one in a DVD shop.   **[6 marks]**

d)   What makes a system "easy to maintain"? Explain any *two* ways how this can be achieved.
        [4 marks]

QUESTION B3
This question is about *Programming Concepts.*

a)   Explain the following terms:
       i.   Logical Error;
       ii.   High Level Languages;
       iii.   Translator;
       iv.   Syntax Error.   **[8 marks]**

b)   Identify and explain *three data types.*   **[3 marks]**

c)   Write a program that accepts a student mark as input. The input should ask 'Enter mark obtained'. The program should output, pass if the student's mark is above 50, or otherwise fail.
        [5 marks]

d)   There are *two* types of *Logical Expressions.* Briefly explain each one of them.   **[4 marks]**

QUESTION B4
This question is about *System Development*.

a)   Differentiate between *alpha testing and acceptance testing*.   **[4 marks]**

b)   Mention and explain any *three* key principles of object oriented development.   **[3 marks]**

c)   Outline *four* factors that can contribute to choosing a particular design over another.
        [4 marks]

d)   Draw a *DFD* for a business process of your choice. Explain why the *DFD* would be beneficial to the coder.   **[5 marks]**

e)   What is TELOS? Why is it used?   **[4 marks]**