MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

UNIVERSITY OF MALTA, MSIDA

MATRICULATION EXAMINATION
ADVANCED LEVEL
SEPTEMBER 2014

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	I
DATE:	2nd September 2014
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) Provide a suitable definition for each of the following *Backup Methods.*
   i. *RAID System*
   ii. *Grandfather-Father-Son*
   iii. *Offsite Backups*. **[6 marks]**

b) What is meant by the term *"Garbage in – Garbage out"?* **[2 marks]**

c) Explain the following *Communication Media*
   i. Fibre Optic
   ii. *Bluetooth*. **[4 marks]**

d) Define the term '*Expert System*'. Briefly give *two* uses for such a system. **[4 marks]**

e) Explain the term *Prototyping.* **[2 marks]**

f) How can *Management Information Systems* help managers take decisions? **[2 marks]**

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2

This question is about *Processing Modes & Training.*

a) A factory uses *Batch Processing* to compute employee salaries. Explain one advantage and one disadvantage of such a method. **[5 marks]**

b) The accounts clerk has never used a computer and is finding difficulties operating the system and needs *training.* What methods of training would you choose for such person? Explain your answer. **[6 marks]**

c) What is the difference between a i) *Master File* and a ii) *Transaction File*? **[3 marks]**

d) An Airline has recently adopted a *Real Time* ticket processing system. Employees are objecting to this change claiming the old system was easy to use and more practical. Explain how *training* can help overcome resistance to change? **[6 marks]**

QUESTION A3

This question is about *Networks.*

a) Define *topologies* and give *one example* . **[3 marks]**

b) Explain the software and hardware components needed for *Cloud Computing* to be implemented. **[3 marks]**

c) What measures would you adopt to reduce *Interference* in a WLAN? **[3 marks]**

d) Differentiate between *Half-Duplex* and *Full-Duplex* transmission. **[4 marks]**

e) Explain the use of *bridges* and *gateways.* **[4 marks]**

f) What is *Internet Protocol* and why is it needed? **[3 marks]**

QUESTION A4

This question is about *Project Management.*

a) Explain what is meant by *Project Management.* **[2 marks]**

b) *Project Managers* are often faced with tight schedules, communication problems and potential fines if deadlines are exceeded. Explain how you would plan and schedule projects so as to avoid these problems. **[5 marks]**

c) Outline the criteria by which a *Project Manager* should be chosen. **[3 marks]**

d) List and explain ways by which a *Project Manager* can review and analyse progress in a particular project. **[5 marks]**

e) What makes a good project team? What measures can the *Project Manager* take to build a successful team? **[5 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) What is meant by 'Communication'? **[4 marks]**

b) Outline a communication model. **[4 marks]**

c) Mention *two* features of the traditional printing processes – books and newspapers. **[4 marks]**

d) Explain three ways how electronic communication is affecting business. **[3 marks]**

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2

What is meant by E-Government? What are the advantages and disadvantages of E-Government? What type of services are normally offered through E-government. **[15 Marks]**

QUESTION B3

Describe the roles of the Chief Information Officer (CIO) and the Chief Security Officer (CSO) in a large organisation? **[15 Marks]**

QUESTION B4

Discuss the statement 'A society based on information technology is threatened by itself'. In your answer describe the different types of crime that can be perpetuated through the use of the Internet. **[15 Marks]**

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SEPTEMBER 2014

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	II
DATE:	3rd September 2014
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) Briefly explain any *two* advantages and any *two* disadvantages with the ever increasing usage of computer mobility in our lives. **[5 marks]**

b) Explain the following:
   i. *RSS*
   ii. *CSS*
   iii. HTML **[6 marks]**

c) Differentiate between *Specific Application Software and General Purpose Software*. **[2 marks]**

d) What is *Normalisation* in Databases*?* Provide two examples. **[2 marks]**

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2

This question is about *Software.*

a) Provide examples and real life scenarios where the following types of *Software* can be used.
   i. *Utility Programs*
   ii. *Translators* **[6 marks]**

b) Illustrate the importance of *Upgrades Compatibility.* Show how these affect software houses and users alike. **[5 marks]**

c) Describe *two* criteria you would use to choose software. **[4 marks]**

QUESTION A3
This question is about *Databases.*

a) Compare and contrast *Manual Filing Systems* to *DBMS*, outlining *two* advantages and two disadvantages of each. **[4 marks]**

b) Explain the following terms:
   i. *Key Field*;
   ii. *Entity*;
   iii. Secondary Key. **[3 marks]**

c) What is the difference between *Data Dictionary* and *File Manager?* **[4 marks]**

d) There are three types of *relationships.* Illustrate each type with an example. **[4 marks]**

QUESTION A4
This question is about *Internet Related Software & Security.*

a) How should *Field Validation* be implemented in a web form*?* **[2 marks]**

b) What measures can be implemented to raise awareness against *Social Engineering?* **[4 marks]**

c) Define a *Key Logger*. **[1 mark]**

d) A sportswear franchise commissioned you to design a web site for their chain of shops in Malta. Outline any *three* important features that should be implemented in the web site. **[5 marks]**

e) Why are *Internet Protocols* needed? **[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.

```
1  public class P2_Sep_2014 {
2
3      public static void main(String[] args) {
4
5          int a = 20;
6          int b = 30;
7
8          int ans = a + b;
9          System.out.println ("Answer = ");
10
11     }
12 }
```

a) With reference to the program code displayed at the bottom of Page 2:
   i. Identify the mistake in the above program.
   ii. What is this mistake called?
   iii. Modify the program so it can accept input from the user and output the multiplication of the two variables.
   iv. Provide ways how to make the program more user friendly. **[10 marks]**

```
CREATE DATABASE [SAMPLE]

CREATE TABLE [SAMPLETABLE]
(
[id] [int] IDENTITY (1,1) NOT NULL,
[Name] [NVARCHAR] (75),
[DATE] [datetime]
)

INSERT INFO [sampletable] ([Name], [Date])
VALUES('John Camilleri','15/4/2014')
```

b) With reference to the SQL snippet above:
   i. State what is happening when the SQL code is run?
   ii. What does the statement "*[Name] [NVARCHAR] (75)" mean?* **[5 marks]**

c) Write down the HTML code to display a 3x3 table. The top row should have the following headings.

Name	Subject	Marks

[5 marks]

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2

This question is about *Design, Programming & Testing.*

a) Outline potential difficulties a programmer may encounter when converting design ideas into programming. **[5 marks]**

b) Develop an algorithm to display the contents of a one dimensional array comprising a list of numbers. The algorithm should process data as it is being fetched from the array to output the average value of the numbers. **[5 marks]**

c) Convert the algorithm in part (b) to JAVA. **[5 marks]**

d) Differentiate between any two different *Testing* techniques and state their importance in system development. **[5 marks]**

QUESTION B3

This question is about *System Development.*

a) Draw a DFD diagram to represent the University Admission process. Use the following information.
   i. The student sends the application form. A 'Rejected' letter is issued if the student does not meet the desired criteria.
   ii. If the desired criteria are met, student details are entered in the database and an acceptance letter issued. **[5 marks]**

b) Write down the potential problems encountered when using *questionnaires* as the sole method to identify pitfalls in the system. Outline how you could solve such problems. **[5 marks]**

c) What *Implementation method* would you adopt for a small scale grocery seeking to upgrade stock control to an automated system? Justify your answer. **[5 marks]**

d) Outline some good practices that would simplify the maintenance of an existing system. **[5 marks]**

QUESTION B4

This question is about *Programming.*

a) Explain any two differences between *Natural & Formal Languages*? **[2 marks]**

b) In Java, *static polymorphism* is achieved through method overloading. Write a program to demonstrate *Static Polymorphism*. Follow the criteria below:
   i. The program should have 2 classes (Test, DemoOverload)
   ii. Class DemoOverload will have 2 methods. Method 1 will return a simple addition between two variables and method 2 will return a simple addition between three variables.
   iii. Class Test will create an instance of DemoOverload and invoke the methods depending on the parameters passed. **[8 marks]**

c) In relation to *Error types & Debugging* explain the following
   i. *Trace*
   ii. *Identifier Evaluation*
   iii. *Breakpoint* **[6 marks]**

d) Explain what is meant by the term *Modularity.* **[4 marks]**