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

MATRICULATION EXAMINATION
ADVANCED LEVEL
MAY 2015

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	I
DATE:	19th May 2015
TIME:	4.00 p.m. to 7.00 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) This part is on *Information Systems in organizations*.

   i. Briefly describe any *three* characteristics of a Management Information System.

   ii. Explain any *two* uses of an expert system.

   iii. Briefly explain what is i) a smart card and ii) RFID.

   iv. Briefly explain *any two* issues that might indicate the need for a new information system.

   v. What plan could be used as a counter measure for data loss prevention?

[10 marks]

b) This part is on *Networks*.

   i. Mention any *two* advantages of Fibre Optic cable in comparison to Coaxial cable media.

   ii. Define the following acronyms: *PAN* and *MAN*.

   iii. Explain any *two* security measures you would adopt to ensure the protection of a *LAN*.

   iv. List any *four* main types of network topologies.

   v. Explain any *two* differences between a server-based and a peer-to-peer network.

[10 marks]

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2
This question is about *Computer Systems*.

a) What is the function of the ALU and CU respectively? **[2 marks]**

b) What is the difference between ASCII and UNICODE? **[2 marks]**

c) Differentiate between Servers and Supercomputers. Provide a practical situation for both.
[3 marks]

d) Mention how with the use of software and hardware a visually impaired student may be helped during lessons to input data. **[2 marks]**

e) What are *two* advantages and *two* disadvantages of using SSDs (Solid State Drives)?
[4 marks]

f) Briefly explain how students in secondary schools may use different devices to be engaged in learning new topics**. [2 marks]**

g) Describe *one* major difference between different types of Optical Discs currently available. Substantiate your answer with figures. **[2 marks]**

h) Briefly explain how tablets can be useful in a classroom. **[3 marks]**

QUESTION A3
This question is about the *Backups* and *Security*.

a) Define and explain the term *RAID* system. Give a simple example of its use. **[3 marks]**

b) What are *offsite backups*? Give a practical example where these might be useful. **[2 marks]**

c) What is the difference between a *full backup strategy* and an *incremental backup strategy?* Illustrate *two* advantages and *two* disadvantages of each. **[4 marks]**

d) What are *Biometrics?* Give *two* examples and state how they can be useful in enhancing security. **[4 marks]**

e) What is the difference between *physical* and *electronic* security. Give one example of each.
[4 marks]

f) How may organisations protect data in transit? Provide *two* scenarios where this method might be needed. **[3 marks]**

QUESTION A4

This question is about *Information Policies* and *Data Validation*.

a) Explain the concept of *Garbage in – Garbage out*. **[2 marks]**

b) A local school requires an information policy for handling, editing, saving, creating and deleting academic data. Considering that this information may be accessed by teachers, technicians, administration, students and parents alike, create a brief draft information policy. **[6 marks]**

c) Refer to the example illustrated in part (b). Would you opt for *centralisation* or *decentralisation* of data? Give reasons for your answer. **[3 marks]**

d) Why is it important to have '*Consistency of Information' within* an organisation? **[3 marks]**

e) Briefly explain any *three* validation checks of data. **[3 marks]**

f) List any *three* errors that are commonly associated with *Data Input*. **[3 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) Mention any *four* different methods used by organisations to spread information to the outside world. **[4 marks]**

b) Describe any *four* different methods that an organisation may use to encourage upward communication. **[4 marks]**

c) Mention *two* advantages and *two* disadvantages of the internet as a communication tool. **[4 marks]**

d) What is meant by (a) Lateral Communication and (b) Grapevine communication used in internal communication in an organization? **[3 marks]**

Please turn the page.

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2

Describe two external and two internal forces that lead to change in organisations. Why is change necessary? How can resistance to change be overcome? **[15 marks]**

QUESTION B3

Explain the main purposes and responsibilities of the Procurement/Purchasing Department. How can this department contribute to the profitability of the organisation? **[15 marks]**

QUESTION B4

Define e-government. Discuss *two* advantages and *two* disadvantages of e-government. Give examples of *four* services being offered by the Government through the internet. **[15 marks]**

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UNIVERSITY OF MALTA, MSIDA

MATRICULATION EXAMINATION
ADVANCED LEVEL
MAY 2015

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	II
DATE:	20th May 2015
TIME:	4.00 p.m. to 7.00 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: SOFTWARE

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

QUESTION A1
This question is compulsory. Answer all parts.

a)   Explain the difference between the following pairs:
   i.   *System Software* and *Application Software*;
   ii. *Multitasking* and *Multiprogramming*.   **[4 marks]**

b)   Give *one* advantage and *one* disadvantage of the following types of application software:
   i.   Specific;
   ii. Generic;
   iii. Application Generators;
   iv. Integrated and software suites.   **[8 marks]**

c)   Explain the term *Amalgamated Services* and give an example.

                                                                           [3 marks]

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2
This question is about *Internet Related Software.*

a) What is the difference between *Intranets* and *Extranets?* Provide an example how a small business firm can use the two to its advantage.   **[4 marks]**

b) What is the difference between a *DNS* and a *TLD*?   **[2 marks]**

c) What is an *ISP*?   **[2 marks]**

d) Describe how fraud can occur on the *Internet?* Give any **two** examples of such mishaps to substantiate your answer.   **[4 marks]**

e) Malware is a major problem but it is often referred to for viruses only. State three other security problems users might encounter on the *Internet*.   **[3 marks]**

QUESTION A3
This question is about *Filing Systems and Database Design*.

a) Define *manual filing systems*. State any **two** disadvantages of such systems.

                                   [4 marks]

b) Explain the limitations of a *flat file approach*.

                                   [3 marks]

c) With reference to question (b) explain *two* ways how these limitations can be overcome.

                                   [2 marks]

d) Mention and describe any *four* issues to be considered when designing a database.

                                   [4 marks]

e) Should end users be involved in the design of a database? Discuss.

                                   [2 marks]

QUESTION A4
This question is about *Software*.

a) List any *four* criteria for the evaluation of software.   **[4 marks]**

b) "Portability is essential when designing software. Failure to achieve such a capability may result in a disadvantage when compared to other software." Explain the term *portability* and substantiate this statement.   **[4 marks]**

c) An important component of an OS is *Resource Allocation and Scheduling*. What is meant by *Resource Allocation and Scheduling*?   **[3 marks]**

d) The *Operating System* is the interface between the user and hardware. Discuss *two* scenarios where:
   i.   speed is preferred to any other criteria during design;
   ii. ease-of-use is preferred to any other criteria during design.   **[4 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  class Integers {
2     public static void main(String[] arguments) {
3        int c; //declaring a variable
4
5     /* Using for loop to repeat instruction execution */
6
7        for (c = 1; c <= 10; c++) {
8           System.out.println(c);
9        }
10    }
11 }
```

a) Explain the output of this algorithm.   **[4 marks]**

b) What is the difference between *definite loops* and *indefinite loops?*   **[2 marks]**

c) Write a program that outputs a multiplication table (10 values) based on a user's choice from 1 to 10.   **[4 marks]**
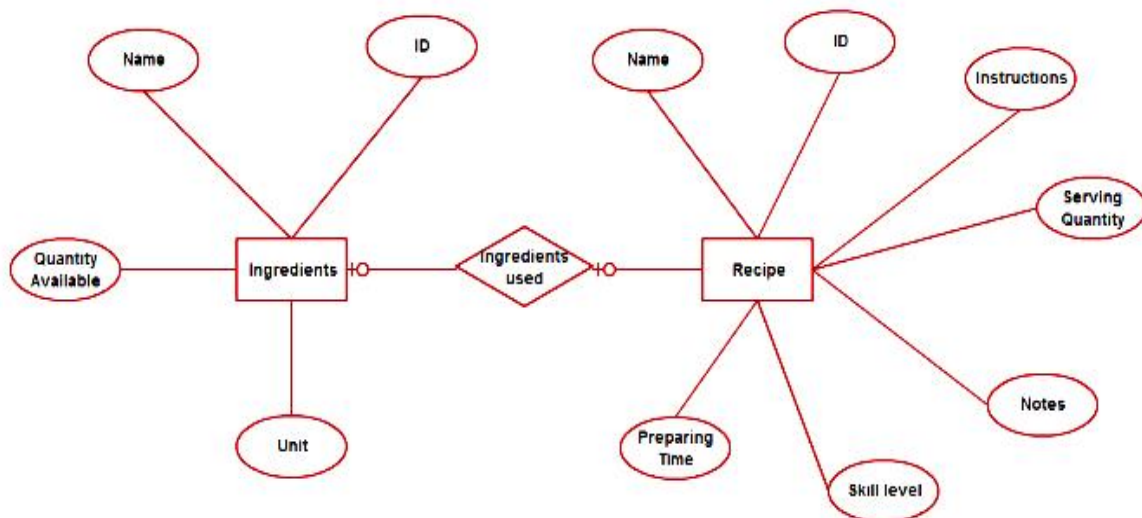
d) Explain the E-R diagram shown above. **[2 marks]**

e) Write an SQL statement to output the preparing time of the recipe with ID "401". **[3 marks]**

```
<table border="1">
 <tr>
  <th>Month</th>
  <th>Savings</th>
 </tr>
 <tr>
  <td>January</td>
  <td>€100</td>
 </tr>
 <tr>
  <td>February</td>
  <td>€80</td>
 </tr>
</table>
```

f) With reference to the code shown above explain the following tags:
   i. <th>
   ii. <tr>
   iii. <td>
   iv. </table>
   v. <table border="1"> **[5 marks]**

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2
This question is about *Testing and Maintenance.*

a) What is the difference between the following types of *testing*:
   i.   Dry Run;
   ii. Unit Testing;
   iii. Integration Testing?   **[6 marks]**

b) Mention and describe ***three*** criteria used to evaluate a computer system. Provide examples where possible.   **[6 marks]**

c) Ease of maintenance is crucial to keep a computer system efficient. Explain ***two*** measures that one may take to ensure trouble free maintenance.   **[4 marks]**

d) Describe any ***two*** issues that might be encountered if a computer system is badly designed or documented.   **[4 marks]**

QUESTION B3
This question is about *Design and Implementation*.

a) With reference to *Implementation e*xplain the importance of:
   i.   *Staff Training* when putting a new system into place;
   ii. *User's guide* and *technical documentation.*   **[4 marks]**

b) What is the difference between the following *Implementation methods*:
   i.   *Parallel*;
   ii. *Direct*;
   iii. *Pilot (Phased).*   **[6 marks]**

c) Explain the following : i) *UML Class diagrams*, ii) *UML Use Case Diagrams*, and iii) *normalised tables*.   **[6 marks]**

d) Explain the *Top-Down* and *Bottom-Up* design approaches.   **[4 marks]**

Please turn the page.

QUESTION B4
This question is about *Programming*.

a) Write a program that will ask the user to cast a vote between two games (Fifa 2015 and PES 2015). Upon selection the program will use two variables (countfifa and countpes) to keep track of votes. The program will then thank the user for the selection, and ask if another vote is needed.

[6 marks]

b) Explain the following terms by providing one example of each:
   i. *Control Structure*;
   ii. *Reserved words*;
   iii. *Logical Expressions* ;
   iv. *Constants*. **[8 marks]**

c) What is *modularity*? **[3 marks]**

d) Differentiate between *simple* and *structured data types.* Provide examples to substantiate your answer. **[3 marks]**