

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD
UNIVERSITY OF MALTA, MSIDA
MATRICULATION EXAMINATION
ADVANCED LEVEL
MAY 2014

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	I
DATE:	21 st May 2014
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 the *Information Systems in Organisations*.
- Briefly describe i) *Strategic*, ii) *Tactical* and iii) *Operational Information Systems*.
 - What is OLAP? Briefly Explain. **[4 marks]**
- b) This part is on *Data and Data Capture*.
- Give an overview of *EDI* and state *three* of its advantages to business organisations.
 - Outline the effects that *negligence* can have in an IS environment. **[4 marks]**
- c) This part is on *Number base Systems and Databases*.
- Add 10110101 and 11001100.
 - Define the *floating point representation* giving a suitable example.
 - Explain the term *Normalisation*. **[6 marks]**
- d) This part is on *User Interface and HCI in IS*.
- State how emerging technologies can help people with physical impairment and provide suitable examples to substantiate your conclusions.
 - Outline *one* advantage and *one* disadvantage of using text versus graphics when designing operational software.
 - How would you implement a security feature through a new technology when designing a mobile application? **[6 marks]**

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2

This question is about *Data Input, Validation & Verification*.

- a) What is the difference between *Validation & Verification*? **[2 marks]**
- b) Explain the following:
- i. *Range Check*
 - ii. *File look-up Check*
 - iii. *Look-up List Check* **[6 marks]**
- c) State how effective *Data Validation* can decrease running costs in an IT organisation. Provide examples where possible. **[4 marks]**
- d) Mention *two* common errors one would expect to find during *Data Validation* and explain how these can be rectified. **[4 marks]**
- e) What *Input Devices* would you recommend to an IT organisation aiming at decreasing costs of Data Inputting in an office? Justify your answer with examples. **[4 marks]**

QUESTION A3

This question is about *Computer Systems*.

- a) A medium sized school would like to outsource its IT services (including e-mails, online management system, storage space etc.) to a private company. Would you be in favour or against such move? Justify your answer. **[5 marks]**
- b) The Head of School is considering an upgrade in the computer labs. What type of computers and storage devices would you recommend and why? Is a paradigm shift towards *Mobile Technology* and *Cloud Computing* advisable in this case? **[8 marks]**
- c) What *Input & Output Devices* would you recommend to the school keeping in mind mixed ability students? How would you implement such aids for the full integration of all students? **[7 marks]**

QUESTION A4

This question is about *Security*.

- a) Explain the importance of *Data Integrity* in an organisation. [2 marks]
- b) Differentiate between *Authentication & Authorization*. [2 marks]
- c) Outline *two Authentication* technologies and describe *one* of them whilst providing a practical real life example. [4 marks]
- d) An IT organisation has been struck by an electric power surge caused by lightning leading to loss of data. Outline consistent actions to be taken to prevent such loss of data? [6 marks]
- e) Users often complain that passwords are too long or complex to remember. How would you go about explaining to employees the need for such policies? [3 marks]
- f) What *three* security measures would you implement to prevent an electronic malicious attack? [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.

Consider the context of a large business organisation.

- a) Mention *two* advantages and two disadvantages of verbal communication. [4 marks]
- b) Outline *four* technologies related to verbal communication. [4 marks]
- c) Mention *two* advantages and two disadvantages of written communication. [4 marks]
- d) Describe *three* Internet Utilities that can be used as communication tools. [3 marks]

Please turn the page.

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2

Explain why a company spreads information to the outside world. Describe at least *five* different methods that can be used to spread such information. **[15 marks]**

QUESTION B3

Differentiate between a sole trader, a partnership, a Private (Ltd) Company and a Co-operative Society. What are the advantages and disadvantages of each one of them? **[15 marks]**

QUESTION B4

Explain the main responsibilities and purposes of the Human Resource Department. How can the Human Resource Department contribute to the profits generated by the organisation? Give *five* reasons for your answer. **[15 marks]**

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD
UNIVERSITY OF MALTA, MSIDA
MATRICULATION EXAMINATION
ADVANCED LEVEL
MAY 2014

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	II
DATE:	22 nd May 2014
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) There are two categories of *Software*. Briefly explain the difference between the *two* categories and provide *two* examples. **[3 marks]**
- b) Explain the following terms:
i. OLE;
ii. Data Consistency;
iii. IMAP. **[6 marks]**
- c) Differentiate between the following:
i. *Machine Language* and *Assembly Language*;
ii. *Digital Signatures* and *Digital Certificates*. **[4 marks]**
- d) Explain *two* utilities a user may use while on the *Internet*. **[2 marks]**

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2

This question is about *Software*.

- a) “*Software is dictating the direction of the development for hardware devices*”. Do you agree with such statement? Substantiate your reasoning. **[5 marks]**
- b) What is meant by *Application Generators*? Provide a practical example where such capability may be useful. **[2 marks]**
- c) Describe the following components of an *Operating System*.
- i. *Kernel*
 - ii. *Memory Manager* **[4 marks]**
- d) What is *Portability*? Explain why such feature is essential for business growth. **[4 marks]**

QUESTION A3

This question is about *Databases*.

- a) A book shop database has the following schema:
CLIENT (Student_ID, Name, Surname, Subject, Marks, Exam Date)
- Write a simple SQL statement to output the students who obtained more than 75% in the Computing examination. Sort the output by Marks in descending order. **[3 marks]**
- b) With reference to part (a) provide correct data types for the fields mentioned. **[2 marks]**
- c) *Databases* can be used in conjunction with websites. Provide an example stating clearly why you would choose to make use of a *Database* in your website. **[4 marks]**
- d) What is a *DBMS*? **[3 marks]**
- e) Explain the following in relation to a *Three Level Schema*.
- i. *Conceptual*
 - ii. *Logical*
 - iii. *Physical* **[3 marks]**

QUESTION A4

This question is about *Internet*.

- a) What is the difference between the following terms:
 - i. *Intranet* and *Extranet*;
 - ii. *HTTP* and *SMTP*;
 - iii. *Worm* and *Virus*?

[6 marks]
- b) There are several *Internet client Applications*. Briefly explain the purpose, features, advantages and disadvantages of *two* of them.

[4 marks]
- c) How can a user be subject to *Internet Based Fraud*?

[2 marks]
- d) In relation to part (c) provide ways how a user can prevent such threats.

[3 marks]

SECTION B: PROGRAMMING TECHNIQUES AND SYSTEM DEVELOPMENT

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

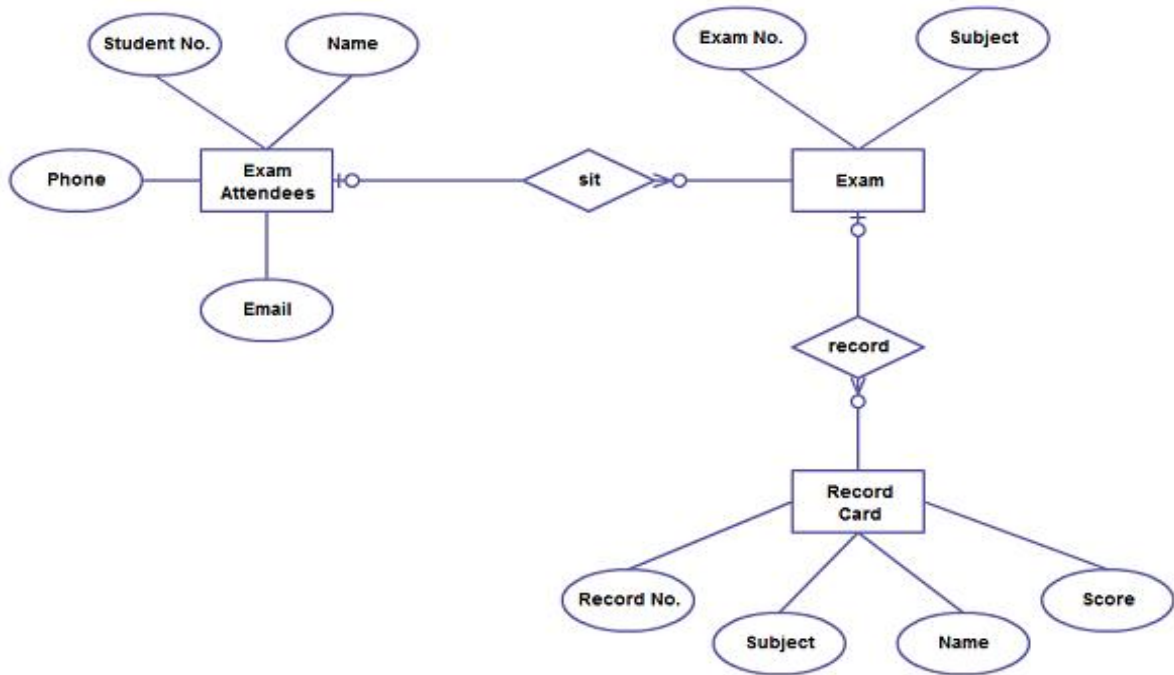
QUESTION B1

This question is compulsory. Answer all parts.

```
1 public class P2_May_2014 {
2
3     public static void main(String[] args) {
4
5         do {
6             char ans = 'y';
7             int count = 1;
8
9             do {
10                System.out.println(count++);
11            } while (count <= 10);
12
13            System.out.println("run the program again?");
14            ans = Keyboard.readChar();
15        } while (ans == 'y');
16    }
17 }
```

- a) With reference to the above code, answer the following questions:
 - i. What is the program doing?
 - ii. Write down the variables used in this program.
 - iii. Would the program work as is? Explain your answer.
 - iv. Suggest an improvement to this program.

[10 marks]



- b) From the E-R Diagram above:
- i. Write an SQL statement to output the name of those students who sat for the exam. Sort your answer in ascending order.
 - ii. What is the use of an ER Diagram?
 - iii. Write an SQL statement to output the highest mark obtained by a student. **[5 marks]**

c) This part is about *HTML & CSS*.

`<style>`

`a {text-decoration: none; color: #E7277D;}`

`a:hover {text-decoration: none; color: #E7277D; text-decoration:underline}`

`</style>`

- i. What is the above code used for?
- ii. Provide *two* examples to show how CSS can be used to tweak text format in websites.

[5 marks]

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2

This question is about *Programming*.

- a) Explain the following terms:
i. *Constant*;
ii. *Conditional Branching*;
iii. *Method*. [6 marks]
- b) What is the difference between *Imperative Programming* & *Object-Oriented Programming*?
Provide examples. [4 marks]
- c) What is *Encapsulation*? Explain this OOP Concept. [5 marks]
- d) Write down an algorithm to search for a particular student in a class of 10 pupils. [5 marks]

QUESTION B3

This question is about *System Development*.

- a) Explain the *Waterfall Model*. [4 marks]
- b) Define the term *TELOS* and illustrate how it can be of benefit in the successful development of a new system. [5 marks]
- c) A retail store is seeking to upgrade the current stock control system. Explain in detail how to analyse the present system to get the best information possible. [6 marks]
- d) Explain why it is crucial to involve employees in the design of a new system. [5 marks]

QUESTION B4

This question is about the *Design stage in System Development*.

- a) Explain the following terms:
i. *Bottom-up approach*;
ii. *Data Structures*;
iii. *File Organisations*. [6 marks]
- b) What should be kept in mind when designing the Interface of the program? Is a “*let’s incorporate every possible feature*” methodology advisable for every project? [6 marks]
- c) List and explain any *two validation methods* in a registration webpage. [4 marks]
- d) Outline and describe *two* testing methods which can be employed for a new mobile application. [4 marks]