MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

UNIVERSITY OF MALTA, MSIDA

MATRICULATION EXAMINATION
ADVANCED LEVEL
MAY 2013

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	I
DATE:	29th May 2013
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 *Networks in Organisations.*
   i) Explain *three* media used for communication.
   ii) Illustrate the difference between *Asynchronous* and *Synchronous* communication.
   iii) Mention *two* factors affecting data transmission and explain how these factors can be limited and/or improved.
   iv) Define the term *Cloud Computing.* **[8 marks]**

b) This part is on *Security of Data.*
   i) Explain what can be done to improve security against malicious attacks in a DVD Shop while keeping capital costs contained.
   ii) What is *Disaster Planning*? **[4 marks]**

c) This part is on *Data Validation and Verification in IS.*
   i) Identify and explain *three* validation checks.
   ii) What is *verification* as opposed to *validation?* **[4 marks]**

d) This part is on *Expert Systems.*
   i) Define an *Expert System* and outline the basic benefits and limitations of such system when implemented in a manufacturing firm. **[4 marks]**

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2

This question is about *Role of Information Systems in Organisations.*
a)   Identify and explain the ***three*** types of information systems found in organisations. **[6 marks]**

b)   Explain the terms Management Information System and Knowledge Work System. **[5 marks]**

c)   Differentiate between *Strategic, Tactical and Operation* Information systems.   **[9 marks]**

QUESTION A3

This question is about *Data and Data Capture.*
a)   Explain ***two*** methods used for data capturing.   **[4 marks]**

b)   Outline *two* differences between *OCR* and *OMR*.   **[2 marks]**

c)   Briefly state how you can implement *RFID* in a medium sized firm and explain the advantages of such an implementation.   **[4 marks]**

d)   Differentiate between *Magnetic Stripe Cards* and *Smart Cards*.   **[4 marks]**

e)   Mention the advantages and disadvantages of using *Bar Codes* as the main method for capturing large volumes of data.   **[3 marks]**

f)   Define the term *EDI.* List and explain any *two* uses for EDI.   **[3 marks]**

QUESTION A4

This question is about *Storage Devices and Security Mechanisms.*
a) What is the difference between *Primary* and *Secondary Storage?*   **[2 marks]**

b) In relation to a small sized firm compare the use, performance and capital costs between the two types of storage.   **[6 marks]**

c) A small sized firm is seeking advice for a reliable backup system. Identify ***three*** backup methods and state how they can be applied.   **[6 marks]**

d) What backup strategy would you choose in the situation described in 4c)? Substantiate your answer with *three* valid reasons.   **[6 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) Compare *four* technologies used in verbal communication. **[4 marks]**

b) *"The lack of good external communication can impact severely on the performance of a business".* State whether you agree with this statement and why. **[4 marks]**

c) Outline the advantages and usability of *Social Networks* and *Blogs* over *Word-Processing* and *E-mail* technologies when used in written communication. **[4 marks]**

d) How can resistance to change be overcome when implementing an intranet in a school? **[3 marks]**

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2

Show how *Downward Communication* can motivate or demotivate employees. Outline the various opportunities and threats when using such communication in an organisation. **[15 marks]**

QUESTION B3

Explain the main responsibilities and purpose of the *Marketing Department*. Show how the Marketing Department can contribute to a substantial increase in profits. Give reasons for your answers. **[15 marks]**

QUESTION B4

Data Security is a very important factor in an organisation. Draft a well formed report showing all the necessary measures you would take to prevent:
a) hacking;
b) fraud;
c) data loss;
d) plagiarism;
e) illegal copies of data. **[15 marks]**

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MATRICULATION EXAMINATION
ADVANCED LEVEL
MAY 2013

SUBJECT:	INFORMATION TECHNOLOGY
PAPER NUMBER:	II
DATE:	30th May 2013
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) This part is on the *Internet* and *World Wide Web.*
    Explain the difference between the following pairs:
    i) *Intranets* and *Extranets;*
    ii) *WWW* and *Internet;*
    iii) *DNS* and *TLD;*
    iv) *FTP* and *HTTP.*   **[8 marks]**

b) This part is on *Databases.*
    i) List and describe the **three** levels of a database schema.   **[3 marks]**

c) This part is on the *Operating System.*
    i) Explain why the Kernel is a vital component of the OS.
    ii) Though GUI maybe prominent in today's systems, CLI is still used. List **two** examples where CLI may be still preferred to GUI.   **[4 marks]**

Answer ANY TWO questions A2, A3 and A4.

QUESTION A2

This question is about *Internet Client Applications and Security.*
a) Illustrate how a medium sized firm can use *Amalgamated Services* for marketing purposes.
                                                                              [3 marks]

b)   How can *RSS* benefit business growth?   **[3 marks]**

c)   Today's businesses are aware of the importance of mobility. Show with examples how businesses can increase revenues from mobility.   **[4 marks]**

d)   Suggest ways how businesses can address issues like *phishing, key loggers* and *social engineering*.   **[5 marks]**

QUESTION A3

This question is about *Databases.*
a)   A game shop database has the following schema:
     CLIENT (Client_ID, Name, Surname, DOB, Locality)

     Write a simple SQL statement to output the names and surnames of all those clients residing in Mosta. Sort the output by surname.   **[3 marks]**

b)   Why are relationships used between tables? Give an example in relation to the game shop database.
                                                                               [2 marks]
c)   Explain what is meant by 1st, 2nd and 3rd normal form.
                                                                               [3 marks]
d)   Define the term *foreign key*.
                                                                                [1 mark]
e)   What is the role of a *DBA*?
                                                                               [2 marks]
f)   Explain the following issues that have to be considered when designing a database:
     i)   portability;
     ii) security;
     iii) robustness;
     iv) data size.   **[4 marks]**

QUESTION A4

This question is about *Software.*
a)   What is meant by *General Purpose Application Software?*   **[1 mark]**

b)   Provide a practical example where a *General Purpose Application Software* may be used.
                                                                               [2 marks]
c)   What is OLE?   **[2 marks]**

d)   Why is *portability* important to software?   **[2 marks]**

e)   Mention and explain **four** criteria used for *Software Evaluation.*   **[4 marks]**

f)   Explain the difference between *Batch Processing* and *Online Processing.*   **[2 marks]**

g)   What is meant by *off-the-shelf package*?   **[2 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)   Define the *Object-Oriented Programming Paradigm* and explain why it is given so much prominence nowadays. State its advantages in comparison with other paradigms.   **[4 marks]**

b)   Why is it important to write *algorithms* prior to coding? What are the advantages of such an approach towards designing a solution?   **[3 marks]**

c)   Outline the typical *Programming Error Types* and state how to avoid such errors during coding.   **[4 marks]**

d)   What is a *feasibility study*? Mention the main aspects that should be considered when carrying out such a study.   **[5 marks]**

e)   Mention a common pitfall found in the *waterfall methodology*. Explain how the chosen pitfall can reduce efficiency in programming.   **[4 marks]**

Answer ANY TWO questions B2, B3 and B4.

QUESTION B2

a)   Describe *three* methods for collecting information.   **[6 marks]**

b)   A particular project has reached the implementation stage. Suppose a system analyst made crucial mistakes in the analysis of the problem, how would you go about to solve the situation with minimal consequences?   **[4 marks]**

c)   Differentiate between *alpha testing, unit testing* and *acceptance testing*.   **[3 marks]**

d)   List and explain any *two* criteria that can be used to evaluate a system.   **[4 marks]**

e)   What are the issues encountered during maintenance if a system is designed erroneously?
   [3 marks]

QUESTION B3

a)   Differentiate between a *Class* and an *Object.*   **[4 marks]**

b)   What is *Functional Programming*?   **[2 marks]**

c)   Mention **one** feature and **one** advantage of the interpreter.   **[2 marks]**

d)   Explain why 4GLs are normally used in specific environments. Substantiate your answer with *three* examples.   **[6 marks]**

e)   A library has approximately 500 books with 150 clients registered. An application to cater for the library is to be developed.
     i)   What classes can be defined?
     ii) Identify some of the possible attributes and data types associated with the identified classes.
                                                                           [6 marks]

QUESTION B4

a)   What is *polymorphism*?   **[4 marks]**

b)   Use programming examples to explain the following terms:
     i)   loops;
     ii) branching Statement;
     iii) variables.   **[8 marks]**

c)   Using *Pseudo Code* sort 30 student marks stored in a single dimensional array. Explain in detail how you would design such a solution.   **[8 marks]**