

**UNIVERSITY OF MALTA**  
**THE MATRICULATION CERTIFICATE EXAMINATION**  
**ADVANCED LEVEL**

**COMPUTING**

**May 2010**

**EXAMINERS' REPORT**

**MATRICULATION AND SECONDARY EDUCATION**  
**CERTIFICATE EXAMINATIONS BOARD**

**AM Computing  
MAY 2010 SESSION  
EXAMINERS' REPORT**

**Part 1: Statistical Information****Table 1:** Distribution of grades awarded in May 2010

<b>GRADE</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>Abs</b>	<b>Total</b>
<b>Number</b>	20	42	66	43	28	29	4	232
<b>% of Total</b>	8.62	18.10	28.45	18.53	12.07	12.50	1.72	100

**Part 2: Comments regarding candidates' performance*****Question 1***

Majority of the students were well prepared for this question but only half of them gave a correct interpretation of the syntax graph. This might give the impression that the topic is being revised properly by the students.

***Question 2***

This question wasn't meant as a trick question yet majority of the student did not give a straight answer.

***Question 3***

The majority of the students had a good idea of how to use Boolean Algebra Laws to solve the identity.

***Question 4***

- a) The majority of the students gave a correct answer for the first part.
- b) However there was a considerable number that did not work out correctly the two's complement.

***Question 5***

In general students were successful in answering this question. However there were some who misinterpreted and gave answers which were completely out of point.

***Question 6***

A lot of students did not know what were the possible states of a process and in fact most of them mixed them up or gave random answers. For the second part, most students knew what is meant by deadlock but their explanation wasn't always exact.

***Question 7***

The majority of the students had a good idea of how the bubble sort algorithm works and about its complexity (best, worst and average cases). Some students explained it using code/pseudo-code while others used an example. A number of students however, though knowing what it was, failed to clearly explain it.

***Question 8***

- c) The majority of the students provided correct usage of a data definition language within a DBMS. However some students gave confused answers and did not clearly elaborate on the use of a DDL to model the database schema or that it is used to define the structure of files as well as the description of the attributes within the database.
- d) The majority of the students replied correctly to this question. Some students mentioned SQL as one of the tools, rather the correct term/s Data Manipulation Language and Data Query Language.

**Question 9**

Similar to Question 2, majority of students had no straight answer to this question when in reality all that was required was to state that such a process increases execution efficiency and to name three well known techniques to optimise code.

**Question 10**

Majority of students were well prepared for this question and clearly understand the distinction between the three. Some confusion is noticeable between types of compilers and different programming languages.

**Question 11**

- a) There were a considerable number of students who were not sure about the interrupt's relation to the execution of an instruction.
- b) The term polling was also not always understood and was related to timeslots usually associated with OS operation rather than the round robin associated with IO operation.

**Question 12**

Students in general knew the difference between a graphic, sound, video, text and hypermedia file however a substantial number of them could not give an example. In fact most questions had incomplete answers. One of the reasons might be that the file system abstracts the file-type from view. Thus it is recommended that students are given more information on how the file system works.

**Question 13**

The majority of the students answered correctly this question. However there are many who are not able to handle De Morgan's Laws to get the second answer.

**Question 14**

- c) When asked to mention three different types of database models, some students confused these with either the internal structures or the tools within the DBMS. The most common DB models which the students mentioned include: relational, hierarchical and flat file.
- d) The answers supplied reflect the students' good knowledge about the various types of database models.

**Question 15**

- a) The majority of the students answered correctly this question which required five tasks that fall under the responsibility of the DBA. The most common tasks mentioned include:
  - i. The maintenance of the data dictionary
  - ii. The implementation of access privileges for the database users.
  - iii. The allocation of passwords to users

**Question 16**

The majority of the students correctly answered the first part. There were a good number that answered incorrectly, that the contents of the address originating the Move would change.

**Question 17**

Question was intended to query a basic notion which some might take for granted. Very few gave a completely wrong answer while the rest gave an acceptable version of what they thought constitutes a software system. No problem on software development life cycle.

**Question 18**

Half the students gave a correct answer together with a knowledgeable identification of three categories of maintenance. Yet the other half either gave a half-baked answer or no answer at all.

**Question 19**

The majority of the students correctly noted the importance of E-R diagrams in the design of relational databases. However with in part b) of the question they were asked to represent THREE main relationships commonly found between entities in such a database, they failed to correctly use the Crow's foot notation.

**Question 20**

- a) The majority of the students did not elaborate sufficiently on what a data structure is, apart from saying that it is a collection of data. Very few students mentioned the operations associated typically with such structures such as the possibility to add and delete an item.
- b) A number of students tried to explain how the stack's push algorithm works by referring to operands, operators, and memory allocation rather than the software version of the algorithm. A number of the students that did explain how the algorithm works, however they did not refer to the fact that an important issue that needs to be checked by the algorithm is whether the stack is full.

**Paper 2**

**Question 1**

The majority of students who chose this question got it right with slight mistakes in few cases. Clearly those who had a good understanding of the topic could obtain full marks in a shorter time period.

**Question 2**

In general a lot of students answered this question. Most of them knew the answer to the question and answered the questions thoroughly. A substantial number of them failed to complete the whole question leaving important parts out and a good number of them mixed up the definitions, the benefits and limitations. In particular students faced problems when explaining Online and Network OS.

**Question 3**

- a) In their answer, a number of students failed to elaborate sufficiently on the importance and the various forms which lead to effective normalization.
- b) Majority of the students did not introduce suitable attributes, as specified in the question, to act as primary keys or to effectively perform normalization. For example, instead of creating a CompanyID field, students used the supplied Company Title as primary key.
- c) This part of the question depended on part b). Though the majority of the students used the requested notation, their answers were not correct because of incorrect normalization or incorrect use of attributes for primary or foreign keys.
- d) The majority of the students did not correctly use the Crow's foot notation as specified in the question.

**Question 4**

- e) Most students understood this first part though there were a good number of numerically incorrect answers for the total number of instructions.
- f) Answered correctly by the majority, but there was a considerable number who were not able to relate the decimal number to the binary, within the register.
- g) This part of the question required a good understanding of shift. The number of correct answers was considerably less than in part (a).
- h) This depended on (c). Most of those who answered (c) correctly answered d correctly as well.

**Question 5**

Students answered the question well but mixed up file access restrictions and file attributes. Another problem with this question seems to stem from the fact that students tend to ignore the details and do not realise that the marks have been subdivided according to specific components of the answers. For example, clear relevant examples were somewhat missing.

**Question 6**

The majority answered this quite well. This question has mutually dependent parts which are necessary to obtain the correct result. However, when marking, this fact was taken into consideration, and derived results based on initially wrong premise were marked according to the method rather than the answer.

- a) Most students got the truth table correctly.
- b) Most students built the Map correctly. But there was a minority that had no idea of how to handle this, and the subsequent parts.
- c) The majority of the students minimized the Map in the correct way. But there were some who did not understand the mechanism of minimisation.
- d) Most of the students who answered (c) correctly did so as well in (d).

***Question 7***

Very few students selected this question and it was evident that they had difficulty giving a straight answer right away. The question was very direct and initially required the students to state the purpose of this process, namely, to identify errors present in the code that contain irregularities in the language itself as well as the potential outcome. When questioned about the use of the symbol table, majority of students correctly pointed out that it is used to keep a record and track of all variables. For some strange reason when asked what kind of error can be detected during this stage of compilation, the majority of students failed to simply answer 'compile error' and gave several other replies as if they thought it was a trick or complicated answer. Finally, students correctly replied to the rest of the question.

***Question 8***

- a) Strangely enough some students confused binary search with search through a binary tree.
- b) The majority of the students did not correctly compare the linear and the binary search algorithms, mainly because they confused part a) of this question
- c) The majority of the students knew what a linked list is and explained it correctly in terms of nodes and pointers. Very few however mentioned that a node also has data attached to it apart from the pointer.
- d) A number of students found it difficult to explain clearly how the addition and deletion operations within a linked list are performed.
- e) The majority of the students knew that a stack is a LIFO structure and many suggested that a linked list can behave as such by pushing and popping items in the list from the head of the list. However, some explanations left a lot to be desired.

Chairperson  
Board of Examiners  
July 2010