

UNIVERSITY OF MALTA

**SECONDARY EDUCATION CERTIFICATE
SEC**

**COMPUTING
May 2012**

EXAMINERS' REPORT

**MATRICULATION AND SECONDARY EDUCATION
CERTIFICATE EXAMINATIONS BOARD**

SEC EXAMINERS' REPORT MAY 2012

**SEC COMPUTING
May 2012 Session
Examiners' Report**

Part 1: Statistical information

GRADE	1	2	3	4	5	6	7	U	ABS	TOTAL
PAPER A	66	177	228	195	89			42	3	800
PAPER B				68	140	98	60	62	18	446
TOTAL	66	177	228	263	229	98	60	104	21	1246
% OF TOTAL	5.30	14.21	18.30	21.11	18.38	7.87	4.82	8.35	1.69	100

Table 1: Overall statistical information

One thousand two hundred and forty six candidates applied to sit for the Computer Studies SEC level examination, twenty one were private candidates. Seventy two candidates did not present their coursework exercises. The whole candidate cohort is approximately one hundred and fifty candidates less when compared to last year's number of registrations.

Eight hundred candidates applied to take the A-paper whereas four hundred and forty six opted for the B-paper. Thirty seven candidates were absent for both papers, of which three were registered for paper II A and thirty four were registered for paper II B.

Part 2: Comments regarding candidates' performance

Paper 1

Question	Topic covered	Maximum mark	Paper II A Cands.		Paper II B Cands.	
			Average	Facility index	Average	Facility index
1	Logic circuits	9	8.05	0.89	5.81	0.65
2	Number systems	10	8.17	0.82	6.24	0.62
3	Storage media and OS	5	4.68	0.94	3.95	0.79
4	Computer systems	7	6.16	0.88	5.16	0.74
5	Problem analysis and design	10	6.10	0.61	3.41	0.34
6	Networks	6	3.89	0.65	2.88	0.48
7	Language translation	8	7.43	0.93	6.08	0.76
8	Programming	18	12.59	0.70	5.32	0.30
9	Files and databases	8	3.86	0.48	1.76	0.22
10	Security of data	4	3.07	0.77	2.46	0.61

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Table 2: Performance and Facility Levels for Paper 1

In general, candidates that were registered for either paper II A or II B found that the question about 'Files and databases' was the most difficult to respond. On the other hand, it turned out that the question about 'Storage media and OS' was the easiest for both groups of candidates.

Paper II A

Question	Topic covered	Maximum mark	Average	Facility index
1	Logic circuits, number systems and CPU architecture	17	11.79	0.69
2	Networks, embedded systems and processing modes	17	10.65	0.63
3	Peripherals, database design and data access modes	17	11.05	0.65
4	Network services, assembly language and language generation	17	10.35	0.61
5	Programming, system implementation and computer application	17	11.75	0.69

Table 3: Performance and Facility Levels for Paper II A

This paper had five questions, all compulsory, each of which carried seventeen marks to a maximum total of eighty five marks for the whole paper.

Question 4 turned out to be the most difficult question in this paper while questions 1 and 5 turned out to be the easiest. The questions in this paper proved to be more challenging for the candidates sitting for the paper when compared to paper 1 as the highest facility index was 0.69.

Paper II B

Question	Topic covered	Maximum mark	Average	Facility index
1	Computerisation, back up, OS management and computer types	17	10.86	0.64
2	Character coding, computer applications and I/O devices	17	9.31	0.55
3	CPU architecture, booting up, social implications and personnel	17	11.42	0.67
4	Storage media, number systems, logic circuits and security	17	8.66	0.51
5	Database design and programming	17	7.80	0.46

Table 4: Performance and Facility Levels in Paper II B

As for Paper IIA, all the questions in this paper were compulsory.

Candidates found question 5 as the most difficult while question 3 as the easiest. As with paper IIA, the questions in this paper proved to be more challenging for the candidates when compared to paper 1 as the highest facility index was 0.67.

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Coursework interviews

After the coursework of the twenty one private candidates was marked, they were called for an interview held at the MATSEC building. The interviewing board consisted of members from MATSEC and from the Computer Studies examination panel.

The boards' task was checking the authenticity of the coursework exercises that were presented by these candidates. During the interviews it turned out that a couple of candidates were not 'up to scratch' with their coursework! Needless to say, their coursework marks were adjusted accordingly.

Reports on Papers I, IIA & IIB

The comments below are being reproduced *ad verbatim* as compiled by the markers during the marking of scripts.

Paper I

Question 1

The majority of students managed to answer correctly this question. However the students which did not, get the question totally wrong. A common feature in the wrongly drawn circuits was that the AND/OR gate were drawn with only one input.

Question 2

- a. (i) The most common wrong answer was 2^8 .
- (ii) Binary, base 2 and decimal where the most common wrong answers.
- b. (i) Most of the students answered this correctly except for the value of gigabyte where a considerable amount of students answered 1024M x1024M.
- (ii) Only a small number of students did not manage to answer this question.

Question 3

This question was answered correctly by most students however mistakes were done in parts c and d where pen drive was chosen as answer.

Question 4

The majority of students answered correctly this question however most of the mistakes where in part f where students chose mainframe instead of super computer.

Question 5

- a. Most students answered by saying that this is the procedure to computerise a manual system but did not elaborate further. A considerable number of students referred to systems analysis as the person who designs a new system.

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- b. A considerable number of students mistook algorithm for encryption and gave the definition of the latter. Most of the students did not specify that an algorithm is used in the design of a program but referred to an algorithm as a means of explaining what a program does and did not specify that an algorithm may be either as a flowchart or pseudo code.
- c. A very common answer was “explanation of a program using shapes”
- d. The most common answers where:

Answer 1 :

- i. Validation : to check that data is valid
- ii. Verification : to verify data

Answer 2 :

- i. Validation : checking data on entry
- iii. Verification : checking data after input

- e. Many students said that program documentation is to show the user how the program works and how to use it.

Question 6

- a. Many students gave sharing of peripherals and sharing of data as the two advantages of using LANs.
- b. The majority of students answered correctly this question however a very common partially correct answer was that “a modem is used to convert data from one form to another”.
- c. A common answer was that “a conference is held between people who are far away from each other but can see and hear each other” without specifying how and why this is possible. When asked for the hardware involves many students did not include speakers.

Question 7

The majority of students answered correctly this question however when marks were deducted it was mainly because students interchanged source code and machine code.

Question 8

What was noted in this question was that a considerable number of students did not manage to explain the algorithm in words however they managed to write the program correctly (or nearly correct). A common mistake found in the program was that the students wrote if condition in the following manner:

```
If (i mod 4 =0)
then
    Written (i,'is leap')
else
    i=i+1;
```

Question 9

- a. Most students managed to give two types of operations.
- b. A small number of students managed to answer correctly this part.

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- c. (i) The majority of students answered correctly this part.
- (ii) Many students made reference to fetching certain data from transaction file to calculate the wage then update the master file.

Question 10

- a. This part was answered correctly by the majority of students.
- b. A considerable number of students said installing a firewall would increase security and encrypting data would increase privacy.

Paper II A

Question 1

- a. (i) The absolute majority of students answered this question correctly. It has to be noted, however, that many students need to present logic diagrams in a neater way, in pencil, lines drawn clearly with ruler and the symbols drawn should be drawn more clearly and precise. It's very important that students should understand the need for better presentation of diagrams.
- (ii) The majority of students answered this question correctly, i.e., all columns have been completed correctly. Few students answered it incorrectly.
- (iii) A number of students answered this question correctly, i.e. AND gate. However a number of students did not realise that the logic behind this function was a 2 input AND gate.
- b. (i) The majority of the students failed to understand the properties of an integer, two's complement register. The mistakes were various. Students need to understand that a two's complement, integer register is one which is able to store both negative and positive, integer values. In this case, the range should be: -128 to +127
- (ii) Most students know what shifting of bits is all about with many students obtaining the correct answer. Few students answered it incorrectly due to wrong mathematical calculations.
- (iii) A number of students have failed to obtain a correct answer due to wrong calculation. Values should be converted into two's complement (in case of positive integer it will remain as it is) and added together. A number of students failed to understand and be proficient with working in binary two's complement
- c. (i) The majority of students answered this correctly.
- (ii) The majority of the students failed to list the exact sequence of steps as indicated in the syllabus. A number of the students managed to list most of the steps correctly, but not in their completion.

Question 2

- a. (i) An average number of students answered one difference correctly. The other difference was deemed as incorrect since such a difference was just an opposite difference to the first one. Students need to realise that if two differences are expected, these should be independent of each other.

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- (ii) Similar to a.(i)
 - (iii) More than average number of students answered the question correctly. The principles identified by the data protection act are fixed and clear and any choices should be made from them.
 - (iv) Many students did not understand the differences between piracy and copyright. Both terms were interchanged and most students showed lack of good knowledge about both terms. A high number of students failed to explain the differences due to bad use of English.
- b. (i) Most students showed an overall understanding of an embedded system, however, they failed to indicate, spot-on, what are the properties which make up an embedded system: specific input, output devices, feedback sensors, appropriate processor and built-in firmware.
- (ii) The absolute majority of students answered this correctly.
 - (iii) Most students gave one correct example, obtaining half marks.
- c. (i) Most students managed to list the sequence of words correctly.
- (ii) Most students failed to explain the properties of real-time and batch processing systems. Real-time systems need to carry out the processing and give output within a pre-specified bracket of time, whereas batch processing systems are non-interactive, oriented towards repetitive, similar tasks and not time-bound.
 - (iii) Most students failed to give correct examples. Some students showed that they did not appreciate the difference between 'online' and 'real-time' systems and interchanged both types incorrectly. Examples used for 'real-time' systems were misinterpreted as 'real-time'.

Question 3

- a. (i) The absolute majority of students answered this correctly.
- (ii) The majority of students answered this correctly. Few students failed to identify the VDU as raster based. VDU is not vector based.
- Most students differentiated correctly between colour depth and resolution. Few students did not use correct English. This deficiency has been noticed throughout descriptive based answers.
- (iii) Most students identified the correct type of printer: dot-matrix, and gave a good justification. However, few students failed to give the correct reason for having a buffer.
- b. (i) The absolute majority of students identified both the field and data type correctly. Students who provided 'text' as data type, were also deemed as correct answers.
- (ii) As for b.(i)

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- (iii) The explanation given by students along with the redesign of the same database were correct by most of the students.
- (iv) Most students appreciated the fact that relationships are needed to exchange data and ease the process of data searching and data updating.
- c. (i) Most students explained serial access correctly, however, a large number failed to explain direct access completely and correctly. Many students found difficulty in expressing themselves correctly. Direct access is a type of access where the system goes directly on the record/data to be searched without the need for having to read all the previous records one by one thus avoiding time wastage.
- (ii) The average number of students identified the correct type of access: serial.
- (iii) Most students identified a correct medium e.g. flash drive. However the justification provided was inadequate.

Question 4

- a. (i) Most students failed to identify the main components and characteristics of eLearning: learning through the use of computers based on communication through the internet, sharing different types of communication technologies e.g. webcam, keyboard, audio/video etc..
- (ii) Some students identified one correct situation, whereas the other situation give was not appropriate.
- (iii) Most students failed to give the correct explanation of e-Commerce and gave partly correct answers. E-Commerce is the process of buying and selling online and other business activities through the use of internet.
- (iv) A number of students failed to explain this correctly. They provided answers which did not answer the question given.
- b. (i) A number of students have shown lack of knowledge in identifying correct opcodes, operands and labels. Some students identified a 'conditional instruction' correctly.
- (ii) A number of students understood and answered this question correctly by giving 'two's complement' as a correct answers.
- (iii) Few students gave a correct answer.
- (iv) It has to be noted that the decimal values: positive (unsigned) and negative (two's complement) were deemed as correct hence students who presented -51 or 205 were deemed as correct answers.
- c. (i) Most students listed the correct sequence of words.
- (ii) Most students gave one correct disadvantage and failed to give another, distinctively correct disadvantage.

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Question 5

- a. (i) Most students gave only two correct loops in Pascal. Some students interchanged incorrectly loops with conditional statements (if, if..else).
(ii) Many students answered both questions correctly while few students answered one question correctly, leaving the other question answered incorrectly.
(iii) Most students apprehended the aim of the program and the important use of the MOD function. All students who managed to construct a well structured program, having the mod function, and a correct output obtained almost full marks. A good number of students answered this question correctly.
- b. (i) Surprisingly, a number of students did not provide two correct responses. It has to be noted that, at times, a one/two word sentence is not enough to provide a meaningful answer.
(ii) Most students identified the correct types of changeover: any two from: direct, stepped, pilot, parallel. Few students failed to understand what they were being asked about and provided completely incorrect answers.
(iii) A number of students identified the correct tasks needed by the systems analyst. Few others failed to identify the steps clearly.
- c. (i) A number of students failed to identify the acronym CAD correctly: computer aided design.
- d. (i) The majority of students identified one correct advantage but a number of students failed to give a well justified second advantage. Again, the use of good English in providing explanations might have hindered students from providing correct answers.

Paper II B

Question 1

Candidates generally well answered this question except parts a(iii) where some students failed to give meaningful answers and b(ii).

Question 2

Candidates found quite hard to answer parts b(i) (ii) and c(ii). The difference between vector and raster seemed to be difficult for some candidates to explain. Other parts of the question were generally well answered.

Question 3

Most students performed well in this question.

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Question 4

Most students performed well in this question although some candidates found it difficult to explain the difference between the two wordlengths.

Question 5

This question was generally well answered.

**Chairperson
Board of Examiners
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