

UNIVERSITY OF MALTA

**SECONDARY EDUCATION CERTIFICATE
SEC**

COMPUTING

May 2013

EXAMINERS' REPORT

**MATRICULATION AND SECONDARY EDUCATION
CERTIFICATE EXAMINATIONS BOARD**

Part 1: Statistical Information

One thousand and twenty seven candidates applied to sit for the Computing SEC level examination. This is more than two hundred candidates less when compared to last year's number of registrations.

Seven hundred and twenty candidates applied to take the A-paper whereas three hundred and seven opted for the B- paper. Fifteen candidates were absent in both papers, of which one was registered for paper A and fourteen were registered for paper B.

GRADE	1	2	3	4	5	6	7	U	ABS	TOTAL
PAPER A	58	156	209	164	77			55	1	720
PAPER B				48	98	66	41	40	14	307
TOTAL	58	156	209	212	175	66	41	95	15	1027
% OF TOTAL	5.65	15.19	20.35	20.64	17.04	6.43	3.99	9.25	1.46	100

Table 1: Overall, statistical information

Part 2: Comments regarding candidates, performance

Paper I

Question	Topic Covered	Max	Average	Facility
6	Fetch Execute Cycle	6	2.97	0.5
4	Acronyms	6	3.03	0.51
11	Programming	21	11.36	0.54
9	Algorithms and translators	6	3.49	0.58
3	Systems Analysis	5	2.94	0.59
8	Networking	9	5.44	0.6
10	Computer components	8	4.88	0.61
2	Binary numbers, ASCII and registers	7	4.42	0.63
7	Computer architecture and the CPU	6	3.97	0.66
1	Application Software	5	3.75	0.75
5	Logic	6	4.56	0.76

Table 2: Performance and Facility Levels in Paper 1

The Fetch Execute question turned out to be the most difficult for the candidates, closely followed by the software acronyms question and the programming question. Logic was found to be the easiest topic covered in Paper 1.

Paper II A

Question	Topic Covered	Max	Average	Facility
4	Operating systems, CPU hardware and memory	17	7.18	0.42
3	Programming, translation and programming languages	17	7.47	0.44
2	Networking, storage and I/O	17	8.7	0.51
5	Multimedia, assembly and program testing	17	9.38	0.55
1	Logic and numbers	17	10.3	0.61

Table 3: Performance and Facility Levels in Paper II A

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

The Operating systems/hardware question turned out to be the most difficult question in this paper. The next most difficult topic turned out to be programming. The questions in this paper proved to be challenging for the candidates sitting for the paper as the highest facility index was 0.61. The Logic and numbers question was the easiest question answered as in Paper 1.

Paper II B

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

Question	Topic Covered	Max	Average	Facility
5	Programming	17	8.94	0.53
2	Storage media, ASCII and numbers	17	10.34	0.61
1	Software and hardware	17	11.64	0.68
4	Acronyms, units of speed, effects of computing, and data.	17	12.16	0.72
3	Logic, I/O and storage	17	12.63	0.74

Table 4: Performance and Facility Levels in Paper II B

The question that dealt with programming turned out to be the most difficult with a Facility Index of 0.53. Once again the logic question was the easiest with a Facility Level of 0.74.

Interviews

Interviews with candidates were also held this year. The candidates were interviewed about the project submitted earlier. A number of private were chosen and interviewed by a panel of members from MATSEC and the Computing examination board. Out of the interviewed candidates, some were well prepared and showed they were the authors of their respective coursework while it was clear in some other cases that the candidates didn't know much about the submitted work.

Reports on Papers I, IIA & IIB

Paper I

Question 1

A good number of candidates answered most of this question correctly with a vast majority obtaining at least three marks. The most common mistakes reported were in part (b) create a web page and part (c) the *browser* where *internet* was instead given as an answer.

Question 2

Most candidates answered this question correctly. In part (b) a number of candidates thought that shifting to the right meant multiplying instead of dividing and a few others gave the decimal equivalent to part (c) instead of the binary number.

Question 3

Few candidates obtained full marks in this question as a majority did not list all the steps involved in the development of a computer system and had some of the marks deducted from the total.

Question 4

Very few candidates answered this question correctly. While a number of candidates answered part (c) correctly – CAL, some managed to identify the area of application but failed to name the process.

Question 5

This question was generally answered correctly and was statistically recorded as the question in which the candidates in general did well the most. A few candidates did not manage to get the full marks as they failed to answer part (c) – to fill in the missing values and complete the truth table.

Question 6

The fetch execute cycle seems to be unclear to a number of candidates, with some candidates doing very badly in re-ordering the steps. This question was statistically recorded as the question in which the candidates did well the least.

Question 7

Most candidates answered this question correctly and the question format appears to have been a determining factor. Mistakes most commonly recorded were in parts (b) – read/write line, (c) registers in the Control Unit and (f) data bus width.

Question 8

Candidates generally did well in this question but not many candidates obtained full marks. Most of the incorrect answers were recorded in part (e) – embedded system.

Question 9

The ability recorded for this question was mixed; with some candidates answering the three parts correctly while other candidates answering incorrectly. In part (a) some candidates gave an example of an algorithm rather than define what an algorithm is. In part (b) a few candidates gave ways of representing algorithms but did not highlight the difference between.

Question 10

The range of answers for this question shows that descriptive answers offer a challenge to most candidates. Most of the candidates who failed to obtain any marks for some of the parts in this question gave examples rather than the purpose of the components within a computer system, while others had some marks reduced because their explanations didn't reach the required level.

Question 11

Very few candidates managed to answer this question correctly. The majority had severe difficulties in explaining what the program is doing and did not manage to arrive to the output of the program.

Paper II A

Question 1

- a) i. Most candidates managed to design the circuit correctly with good connections and symbols. However, a number of candidates did not appreciate that all gates are of the same functional power and hence they ended up drawing much bigger logic gates at the end of the circuit to avoid perpendicular lines.
- ii. Most candidates managed to complete the truth table correctly.
- iii. Few candidates answered this question correctly. The mathematical function of the circuit is a logical addition.
- b) i. Most candidates worked out the question correctly and managed to achieve the negative, two's complement number.
- ii. Most candidates answered this question correctly. Some candidates had mistakes in the addition and in the two's complement representation process.
- iii. A good number of candidates managed to obtain a good answer for this question. A few candidates failed to understand that the answer should be understood and interpreted as being a positive binary and hence after obtaining the decimal equivalent, the hexadecimal answer can be calculated.
- c) i. Most candidates answered this question correctly.
- ii. Few candidates managed to obtain a correct answer for this question. The maximum positive value of an 8-bit two's complement register is +127.

Question 2

- a) i. A large number of candidates provided just one correct wireless link. Two examples of wireless links over large distances are satellite links and microwave/radio links.
- ii. Most candidates answered this question correctly.
- iii. Most candidates provided a good answer to this question by explaining the importance of converting from digital to analogue and vice-versa.
- b) i. While most candidates appear to have understood the question, the explanations were generally very poor. Candidates failed to distinguish between direct access and immediate access. This was evident through the examples given.
- ii. The majority of the candidates attempting this question obtained a correct answer.
- iii. Few candidates answered this part of the question correctly. Most candidates showed no knowledge of the disk filing system and its contents.
- iv. Although few candidates provided a good and justifiable answer, the majority chose an inappropriate device.
- c) i. Most candidates provided a good contrast of serial and parallel data transfer however a fair number of candidates answered this incorrectly, mainly confusing it with serial file access and random file access.
- ii. A considerable amount of candidates showed lack of knowledge about the buffer.
- iii. A good number of candidates answered this question correctly but few managed to provide two devices which employ buffering, with some candidates providing just one correct example.

Question 3

- a) Most candidates answered this question correctly. Candidates who failed to answer this question correctly chose looping structures instead of conditional statements.
- b)
 - i. Most candidates provided good JAVA code for the given flowchart with good use of structure, variables, syntax and declarations.
 - ii. While a few candidates replied correctly to this question, the majority provided two lines of code; which is totally incorrect. Other candidates showed lack of knowledge by providing entirely wrong answers.
- c)
 - i. Most candidates answered this question correctly and highlighted the main characteristics such as speed and object code generation.
 - ii. An average number of candidates answered this question correctly, with a number of them giving only ONE advantage.
 - iii. In this part of the question, similar to the previous, some of the candidates managed to answer to ONE disadvantage.
- d)
 - i. Most candidates failed to understand the question and provided wrong answers. Maintenance should be limited to perfective, adaptive and corrective. Most candidates did not provide any of these and listed various incorrect examples.
 - ii. A large number of candidates answered this question about in-line documentation correctly.

Question 4

- a)
 - i. The majority of the candidates answered this question correctly, however a good number of candidates failed to produce two correct characteristics by listing examples of real time operating systems instead.
 - ii. A large number of candidates provided correct examples for this question.
- b)
 - i. Most candidates provided a varied range of hardware resources, all of which were correct.
 - ii. Few candidates managed to obtain full marks in this question. While some candidates failed to differentiate between real-time and online operating systems, others did not manage to get all answers correct.
- c)
 - i. While some candidates answered this question correctly, others mixed the address bus with the data bus.
 - ii. The majority of the candidates gave a correct definition for machine code, but few gave correct answers for opcode and operand.
 - iii. A good number of candidates confused the memory write cycle with the fetch-execute cycle.
 - iv. Most candidates failed to mention caching as an aid to improve the performance of frequently accessed slow devices.

Question 5

- a)
 - i. Most candidates explained well the relation between resolution and speed although some thought that the question was referring to the screen resolution.
 - ii. Most candidates gave a good range of examples.
 - iii. The majority of the candidates provided a good answer to this question with many of them listing RSI as part of the health hazards.
- b)
 - i. Most candidates answered this question correctly.
 - ii. The absolute majority of the candidates answered this question correctly by referring to overflow as the main cause.
 - iii. Candidates provided varied, but correct answers to this question.
 - iv. Few candidates answered correctly by explaining that symbolic addressing gives freedom of relocatability inside memory while still retaining correct programming references.
- c)
 - i. A good number of candidates answered correctly by referring to extreme, invalid and valid data tests.
 - ii. Although a number of candidates answered this question correctly, few managed to provide correct in-depth examples.
 - iii. Most candidates obtained partial marks since most of the answers provided were poorly structured and lacked detail.

Paper II B

Question 1

- a) Most candidates answered this question correctly and no general difficulties were encountered.
- b) Few candidates managed to obtain full marks in this question as they failed to give correct examples and functions.
- c) A good number of candidates managed to obtain full marks in this part of the question.
- d) This part of the question was also generally well answered.
- e) Most candidates obtained a wrong answer for this question as it seems they failed to understand the question.
- f) Candidates failed to show knowledge of the two terms in the question. A few gave an answer to only a part of this question. In part iii b) candidates failed to show the use of ROM.

Question 2

- a) The majority of the candidates managed to answer this section correctly, with few difficulties in answering recorded.
- b) Most candidates answered this section correctly however a few failed to show any knowledge of the ASCII character code.
- c) This question was generally well answered. Few candidates failed to show an understanding of overflow (part iii)

Question 3

- a) A good number of candidates answered this question correctly and correct symbols were given for the expressions.
- b) The truth table part of the question was generally well answered and minimal difficulties by the candidates were recorded.
- c) Even if in this case the acronyms for the internal structure of the computer were given, some candidates failed to associate them with the correct definition.
- d) Candidates managed to identify between the input and output devices presented in this question.
- e) While it is evident that some candidates could not express why backup files are important the majority answered this question correctly.
- f) The majority of the candidates answered this question correctly and placed the titles under the correct headings.

Question 4

- a) The majority of the candidates managed to answer this question correctly and gave proper definitions to the acronyms.
- b) A good number of candidates gave a correct answer to this question and listed both positive and negative effects of computers on our lives.
- c) An absolute majority of candidates re-ordered the frequency units properly and were awarded full marks.
- d) Few candidates answered this question correctly, with the rest failing to provide the required provisions from the Data Protection Act.
- e) No difficulties were recorded from the candidates as the question was generally well answered.
- f) Most candidates failed to obtain full marks in this question, with the majority failing to distinguish between the terms given, such as software activation and software piracy or executable code and source code.

Question 5

- a) Candidates found the descriptive parts of this question easier to answer. Definitions and explaining parts of the code were generally answered correctly, however very few candidates could modify the code to work out the average of two numbers.
- b) Candidates answered this question correctly and most obtained full marks.
- c) The question about HTML was generally well answered and several gave good examples to justify the use of the language.

Chairperson

2013 Examination Panel