UNIVERSITY OF MALTA

SECONDARY EDUCATION CERTIFICATE
SEC

COMPUTER STUDIES

May 2014

EXAMINERS' REPORT

MATRICULATION AND SECONDARY EDUCATION
CERTIFICATE EXAMINATIONS BOARD

SEC Computing
May 2014
Examiners' Report

Part 1: Statistical Information

GRADE	1	2	3	4	5	6	7	U	ABS	TOTAL
PAPER A	61	173	211	153	78			45	4	725
PAPER B				44	91	64	39	34	16	288
TOTAL	61	173	211	197	169	64	39	79	20	1013
% OF TOTAL	6.02	17.08	20.83	19.45	16.68	6.32	3.85	7.80	1.97	100

Table 1: Overall, statistical information

One thousand and thirteen candidates applied to sit for the Computer Studies SEC level examination. This is roughly the same amount of candidates that applied last year.

Seven hundred and twenty five candidates applied to take the A-paper whereas two hundred and eighty eight opted for the B- paper. Twenty candidates were absent in both papers, of which four were registered for paper A and sixteen were registered for paper B.

Part 2: Comments regarding candidates, performance

Paper I

Question	Topic Covered	Max	Average	Facility
1	File access	4	1.42	0.36
8	The stages of computerisation	7	2.94	0.42
2	Relational database	5	2.28	0.46
10	Java Programming	17	8.13	0.48
6	System Bus	3	1.63	0.54
3	CPU and fetch execute cycle	10	6.16	0.62
11	Program translators	7	4.59	0.66
9	Hardware devices	9	6.46	0.72
4	Logic	8	5.83	0.73
5	RAM & ROM	5	3.63	0.73
7	Hardware devices, Software and Networking	10	7.45	0.75

Table 2: Performance and Facility Levels in Paper 1

The File access question turned out to be the most difficult for the candidates, followed by the question about the stages of computerisation, relational database and the programming question. The Hardware devices, Software and Networking question was found to be the easiest topic covered in Paper 1.

Paper II A

Question	Topic Covered	Max	Average	Facility
1	Software and Programming Languages	17	8.92	0.52
3	Networking	17	9.58	0.56
5	Operating Systems	17	10.59	0.62
4	Assembly Language and the CPU	17	10.8	0.64
2	Logic Circuits and Number Representations	17	13.48	0.79

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 Software and programming languages question turned out to be the most difficult question in this paper. The next most difficult topic turned out to be Networking followed by Operating Systems and the question about Assembly Language and the CPU. The candidates found the Logic Circuits and Number Representations question to be the easiest.

Paper II B

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

Question	Topic Covered	Max	Average	Facility
5	Java programming	17	6.2	0.36
2	Records, data entry, programming and the operating system	17	9.22	0.54
4	Hardware, the operating system, numbers and logic	17	9.25	0.54
1	Networking	17	9.46	0.56
3	Computerisation	17	9.86	0.58

Table 4: Performance and Facility Levels in Paper II B

As in previous years, the question that dealt with programming turned out to be by far the most difficult with a Facility Index of 0.36. The candidates found the other questions to be of approximately the same difficulty level with their facility index varying between 0.54 and 0.58.

Interviews

Interviews with candidates were also held this year. The candidates were interviewed about the project submitted earlier. A number of private candidates were chosen and interviewed by a panel of members from MATSEC and the Computer Studies 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 did not know sufficiently about the submitted work.

Reports on Papers I, IIA & IIB

Paper 1

Question 1

Few candidates managed to obtain a pass mark in this question, with the majority obtaining a maximum of one mark.

Question 2

A good number of candidates identified keyfields for the candidates and team tables but fewer candidates gave a correct keyfield for the fixtures table. Most candidates discussed the relationship between the tables in relation to the primary and foreign key rather than giving the cardinality that exists between the tables.

Question 3

Most candidates gave the correct answer for the acronyms however answered personal computer for PC. In the remaining part of the question, a few candidates obtained full marks.

Question 4

Responses suggested that not all candidates understood what was required for part (a) of this question. However, except for a few, the answers provided for part (b) were correct.

Question 5

Unfortunately there are still candidates who do not know what ROM stands for. A good number of candidates did not highlight the main difference between RAM and ROM: that RAM is read/write and ROM is read only. Most candidates answered that RAM is volatile while ROM is not.

Question 6

Few candidates managed to obtain full marks for this question, as most could not distinguish between the data bus and the address bus.

Question 7

Most candidates answered this question correctly and were successful in differentiating between the pair of terms even though a few confused the definitions for Raster and Vector devices.

Question 8

A good number of candidates gave the life-cycle step numbers even if not requested for their answer rather than giving the name for the stages, while other candidates failed to answer this question correctly, mistaking one stage for another.

Question 9

The majority of candidates answered Part (a) of this question correctly. In Part (b) a good number of candidates gave trade names for their answer rather than the generic name of the software.

Question 10

For part (a), most candidates only gave if or if else (which is considered as one correct answer) for the conditional statement and forgot that the switch statement is also a conditional statement. Programming is still the weakest area for most candidates. In fact very few candidates obtained full marks for this part of the question – part (b). In part (c) most candidates only mentioned flowchart and pseudo code but failed to highlight the difference between the two. In part (d) some candidates mixed up logical and runtime errors while others failed to state which error it is. A number of candidates still cannot spot a reserved word in Java.

Question 11

A good number of candidates answered parts (a) and (b) correctly and a good number of candidates were capable of identifying the three translators but a few of these could not highlight a correct feature for each. The majority identified the interpreter as the best-suited program development tool.

Paper II A

Question 1

In general most candidates answered correctly most for the sections within this question. Only a few failed to obtain a pass mark in this question. However, responses suggested that a good number of candidates might have had difficulties in expressing themselves and answering accurately.

a) Most candidates knew that 4th generation languages are more recent than 3rd and since 3rd generation are considered as "older" languages they were defined to be closer to machine code.
b) Most candidates chose a correct 3rd generation language however answered the 4th generation wrong.
c) A large number of candidates answered this incorrectly by explaining that an interpreter translates a program line by line and a compiler translates it at one go. While this is also true, this does not answer the question.
d) The majority of the candidates answered this part correctly but failed to mention that the consent of the author is still necessary when distributing freeware.
e) The majority of candidates answered this part correctly
f) The majority answered this question correctly, with most of the incorrect answers said "parity bit".
g) While a few candidates provided a correct answer, others understood the question wrongly. The answer in this case should focus on cross-platform compatibility.

Question 2

a) The majority of candidates provided complete and correct answers. Some candidates were awarded partial marks for a partly correct truth table.
b) Most candidates managed to answer this part correctly. Those who fared less, usually obtained no marks.

c) A considerable proportion of the answers given were incorrect. Candidates seemed to be lacking the skills to perform binary arithmetic.

d) Most candidates did not have a problem with the binary conversion. However, a considerable number did not manage to arrive to the conclusion that an underflow occurs.

Question 3

a) Most candidates answered correctly by providing and explaining various relevant Internet services.

b) Surprisingly, a large number of candidates answered this question incorrectly be referring to topologies instead of communication media. Clearly, these candidates did not understand the question well. Few candidates provided a correct answer by referring to any of wired communication media such as UTP and Fiber Optic.

c) Few candidates failed to provide a correct answer. A good number of candidates answered correctly by referring to any two of the set of principles found in the Data Protection Act.

d) Most candidates answered this question correctly by specifying tools such as login names and passwords as examples of how to restrain access to data.

e) Most of the candidates achieved partial marks. This was due to the fact that having different access rights was the best answer.

Question 4

a) Some candidates answered this correctly while a few others obtained no marks.

b) Most candidates provided a correct answer by specifying any of the given operators as examples.

c) Most candidates failed to provide a correct answer and did not show capabilities in differentiating between different addressing modes.

d) Most candidates answered this question correctly and obtained full marks by specifying runtime error as the error that will be generated.

e) The correct answer was a multiplication of two. Some candidates provided a correct answer whereas others failed to identify this, obtaining no marks.

f) Most of the candidates answered this correctly by specifying the assembler as the software used.

g) Most of the candidates attempted this question correctly. The instruction register is responsible for holding the op-code.

h) Most of the candidates provided a correct answer and achieved full marks. The control unit and the arithmetic and logical unit are the two units responsible for this.

i) Most candidates answered this question correctly.

Question 5

a) Most of the candidates listed useful features of any operating system and achieved full marks. Others failed to provide a correct answer and thus no marks were awarded.

b) Batch OS's are mostly used for billing and payroll purposes. Some candidates identified these (and others) as good examples and thus obtained full marks. Others failed to provide a correct answer.

c) Most of the candidates answered this question correctly though more detail in explaining how an OS manages such resources was needed, resulting in half marks being awarded.

d) Most of the candidates showed that they have a vague idea of what an embedded system is made up of. However, clear, complete and detailed answers are needed. An embedded system consists of input, processing, output, feedback sensors and proprietary OS whereas a general purposes system is aimed at general purposes use. As a result, a good proportion of the candidates obtained partial marks.

e) Embedded systems are based on the characteristics of: input, processing, output, feedback sensors and proprietary OS. Few candidates provided a correct answer and achieved partial marks.

Paper II B

Question 1

a) A good number of applicants attempted this question correctly by giving the right acronym definition. Few applicants were unable to identify the right definition for each acronym. Few others failed to answer what they were asked for and provided unrelated answers.

b) Most of the applicants provided various and different advantages offered by networks. However, more detail and real life examples are needed. Few applicants failed to provide a correct answer or did not show understanding of the question.

c) Most of the candidates provided a correct answer and attributed viruses, hacking and spying as main threats to networks. Few candidates provided an incorrect answer.

d) A good proportion of the answers provided by candidates were correct by highlighting optic fibre, satellite links and microwave as three different links used in networks. However, a number of candidates failed to identify the three correct terms and provided only two correct terms thus achieving partial marks. Few candidates provided completely incorrect answers.

e) Most answers provided were correct. Only few candidates obtained partial marks while a handful of applicants provided a completely incorrect answer.

f) A fair number of candidates provided incorrect answers. Security and integrity can be assured through backups and file protection methods. A number of candidates showed an understanding of the question and knowledge in the area by providing

correct examples.

g) A number of candidates found it difficult to convey a complete and clear answer to this question whilst showing their understanding of the question. Some candidates provided excellent replies and obtained full marks. Encryption involves scrambling of data so that hackers or infiltrators do not easily read it.

Question 2

a) A good proportion of candidates failed to provide a correct answer to this question by providing irrelevant examples. This shows either lack of understanding of the question or lack of knowledge. Fixed length records are records whose length or number of characters required is fixed for all records e.g. employee date of birth whereas variable length, by nature, can vary in number of characters e.g. employee address.

b) Most of the candidates provided a correct answer and obtained full marks. Few candidates failed to provide a completely correct answer and obtained partial marks due to few incorrect / misplaced terms.

c) The absolute majority of applicants provided a correct answer by assigning the correct terms to the definition and obtained full marks. Only a handful of applicants provided a partially incorrect answer and thus obtained partial marks.

d) Most of the candidates provided the two correct answers by identifying 'area' as an identifier and '=' or '*' as operators, thus achieving the full mark. Only few candidates provided an incorrect answer.

e) Most of the answers were correct with examples of commercial operating systems. Only few candidates provided an incorrect answer.

Question 3

a) Most of the answers provided were correct: CAM – Computer aided manufacturing, CAD – Computer aided design. However, a good number of replies were not completely correct and obtained partial marks. Few candidates answered the question completely wrong.

b) Most of the examples provided by candidates were correct and including social and economic reasons. Only few candidates provided incorrect answers.

c) The majority of the answers provided by candidates were correct by listing all the steps in a correct sequence. Some candidates provided a partially correct sequence of steps and thus obtained partial marks.

d) The absolute majority of the replies provided were correct by assigning the job description with the matching job title. Only a handful of candidates failed to provide at least a partially correct answer.

e) A number of candidates provided a correct answer by highlighting the main characteristics of each type of operating system. However, a number of applicants failed to associate the right characteristics with the relative type of operating system.

f) A relative majority of candidates provided correct examples for each type of operating system. Other candidates provided different and incorrect answers.

Question 4

a) Most of the answers provided were correct and included the three correct hardware components. Only few candidates provided a partially correct answer.

b) Most of the candidates provided a correct answer by referring to (v) as the correct answer.

c) Most candidates provided a correct answer by referring to the hard-disk as the right hardware where to store the operating system.

d)

    i. Most of the answers were correct by indicating 00000000 as the minimum value that can be represented. Some candidates gave the decimal notation instead of binary, which was also taken as correct.

    ii. Surprisingly, only a fair amount of candidates answered this question correctly. Those who gave a wrong answer did not present a common mistake but various wrong values were presented. The maximum value that can be represented is 11111111. Decimal values were also accepted.

    iii. The absolute majority of the replies were correct, indicating 00000000 as the binary equivalent of 0 in decimal.

e)

    i. Regretfully, only a number of candidates provided a correct answer. A relatively large proportion of candidates made mistakes in their computation. The mistakes done were varied and resulted in different values. A smaller number of candidates did not attempt this question.

    ii. A good proportion of the replies were correct by giving 11000111 as the binary equivalent. However, a noticeable number of candidates had mistakes in their computation resulting in wrong answers.

    iii. An average number of candidates attempted the question correctly.

    iv. An average number of candidates attempted this question correctly. For all parts of this question, it has to be noted that most of the work presented by candidates did not reach the level of presentation and legibility expected by the examiners.

f)

    i. A relative majority of candidates drew the correct OR symbol or wrote the name of the gate, both of which were deemed correct. However, a good number of candidates either did not notice this part of this question or, less likely, did not show any knowledge in designing and understanding digital circuits by leaving the missing gate empty.

    ii. Surprisingly, relatively few responses to this question were completely correct and thus awarded full marks. Many candidates gave a partially correct answer whereas few left output Y empty obtaining no marks.

Question 5

a)   The minority of candidates answered this question completely correct and obtained the full marks. Many candidates answered this question partially correct and obtained a partial mark. These candidates did not show a clear understanding of how each variable and data type differ from the rest. Few candidates answered this question completely wrong.

b)   Most of the candidates answered this question incorrectly. The work behind the program is to produce a table of 5.

c)   Many candidates showed knowledge on how to use the '//' symbol to add comments but others either gave a wrong answer or did not attempt the question.

d)   Many candidates failed to indicate the 'for' loop as the loop being used by the program. Many others incorrectly referred to selection statements while a number of candidates left this question unanswered.

e)   Many candidates attempted this question correctly by referring to increment as the work behind the statement.

f)
      i.   A large number of candidates attempted this question correctly

      ii. Many candidates failed to understand the question well and provided incorrect answers. Declaring a variable does not automatically initialise the same variable.

      iii. Many candidates attempted this question correctly.

g)   Many responses to this question were not completely correct due to various mistakes including: logic, poor design, poor legibility, incorrect connection points, missed operations, and bad use of correct symbols. It has to be noted that diagrams play an important role in providing answers and these have to be carefully designed, neatly presented in pencil and planned beforehand.

Chairperson
2014 Examination Panel