



L-Università
ta' Malta

MATSEC
Examinations Board



Examiners' Report

SEC Computing

Special September Session 2020

Examiners' Report (2020): SEC Computing

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A. STATISTICAL INFORMATION

The total number of candidates who registered to sit for Computing was 161, which is 583 candidates less than in 2019. Of these registrations, 89 opted for Paper IIA and 72 opted for Paper IIB.

Table 1 shows the distribution of grades for the Special September 2020 Session of the examination.

GRADE	1	2	3	4	5	6	7	U	ABS	TOTAL
PAPER A	5	19	28	11	6	-	-	18	2	89
PAPER B	-	-	-	4	7	17	15	16	13	72
TOTAL	5	19	28	15	13	17	15	34	15	161
% OF TOTAL	3.11	11.80	17.39	9.32	8.07	10.56	9.32	21.12	9.32	100

Table 1: Distribution of grades for Computing 2020 Special September Session

B. GENERAL REMARKS

General Remarks on Coursework

19 projects submitted by private candidates were corrected.

The examiners highlighted that, most of the work submitted by private candidates was up to SEC standard and the marks achieved were on the high side.

General Remarks on the Written Examination

Throughout both papers, candidates were required to demonstrate ability in all areas of the syllabus. The majority of the candidates gave good responses when recall and comprehension questions were asked. On the other hand, the performance of the candidates in questions that required the application of knowledge was insufficient.

C. COMMENTS ON PAPER I AND PAPER II

Paper I

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	
Max Mark	/6	/2	/4	/5	/8	/5	/16	/4	/4	/5	/4	/5	/6	/5	/6	/85	
Paper IIA	Mean	4.1	1.5	2.6	3.4	6.7	3.3	10.7	3.7	3.7	2.8	2.8	3.9	4.8	2.4	5.1	61.4
	S.D.	1.3	0.5	0.9	1.4	1.6	1.4	2.7	0.6	0.6	1.5	1.3	1.4	1.9	1.8	1.3	12.4
	Facility Index	0.7	0.7	0.6	0.7	0.8	0.7	0.7	0.9	0.9	0.6	0.7	0.8	0.8	0.5	0.8	0.7
	Discrimination Index	0.6	0.3	0.5	0.5	0.6	0.6	0.7	0.5	0.3	0.7	0.7	0.6	0.6	0.8	0.5	-
Paper IIB	Mean	2.3	1.2	1.8	1.8	4.9	1.1	7.8	2.8	3.0	0.4	1.3	1.6	2.7	0.4	3.1	36.2
	S.D.	1.3	0.6	1.1	1.5	2.0	1.1	2.6	1.4	1.0	0.6	1.2	1.6	2.2	0.8	2.1	11.7
	Facility Index	0.4	0.6	0.4	0.4	0.6	0.2	0.5	0.7	0.8	0.1	0.3	0.3	0.5	0.1	0.5	0.4
	Discrimination Index	0.5	0.3	0.3	0.6	0.6	0.6	0.7	0.6	0.3	0.3	0.4	0.7	0.7	0.4	0.6	-

Table 2: Analysis of raw scores in Paper 1 questions by paper choice

The mean is the "average" candidate score to a question. It is computed by adding up the number of marks earned by all candidates, and dividing that total by the number of candidates. The standard deviation, or S.D., is a measure of the dispersion of candidate scores. That is, it indicates how "spread out" the scores were. For example, the majority of candidates got -1.3 and $+1.3$ from the mean (a score between ~ 2.8 and ~ 5.4) in Question 1 Paper 1 (Paper IIA candidates). The Facility Index is a measure of how easy or difficult is a question in an exam. Questions 14 for Paper IIA candidates proved to be the most difficult in Paper I. For Paper IIB candidates, question 10 and 14 were the most difficult followed by question 6. Item discrimination refers to the ability of an item to differentiate among candidates. The closer the value is to 1, the better the discrimination.

Question 1

In part (a), the majority of the candidates identified well the input/output component that provides interface to a smartwatch. In part (b), a good number of candidates selected raster device but the attempt to give a correct reason was inadequate. The attempt of a reasonable amount of candidates to give a good definition for software license in part (c) was insufficient. Candidates who attempted part (d) gave a correct answer for freeware but not for shareware licences.

Question 2

This question required that candidates state whether statements given were true or false. Most candidates managed to answer correctly. However, through the responses it was evident that the statement 'Barcodes are capable of holding a considerable amount of data' confused the candidates. The term 'considerable' was clearly misunderstood.

Question 3

Most candidates performed poor in part (d) where they stated that a systems analyst performs periodic analysis of computer hardware and software using the available technology, rather than a computer engineer.

Question 4

This question required that candidates demonstrate an understanding of spreadsheets. Candidates who performed well were able to describe the 'advantages', 'application of spreadsheets' and 'spreadsheets as part of an integration package.' However, other candidates' performance was insufficient since they were not specific enough in their answers, listed same advantages and lacked knowledge of a spreadsheet as being part of an integrated package.

Question 5

The performance of many candidates in this question was satisfactory, being able to give a list of backing storage devices and their respective use.

Question 6

In part (c), the performance of the majority of candidates was inadequate as the attempt to explain why cache memory can improve the performance was poor. In part (b), the attempt to state what is normally stored in the non-volatile part of a computer's main memory was also inadequate.

Question 7

In part (a), several candidates did not include the property code in the sales table, and included property table fields in clients and sales table. Common mistakes were done for the AutoNumber field setting. Although part (c) was a relatively easy question, candidates gave an incorrect answer or did not attempt it. Some candidates misunderstood the question in part (d) and thought that type check was type of property. Some candidates answered the part about range check correctly.

Question 8

The majority of candidates performed well in this question. Candidates identified correctly the difference between 'tailor made' and 'off the shelf software' and which software is suited best for the company.

Question 9

Candidates performed well in this question and were able to list the hardware devices needed for video conferencing. In addition, the majority of the candidates were able to explain why an antivirus is necessary when using the Internet.

Question 10

The performance of candidates in demonstrating knowledge of how an operating system functions, and to describe the different functions of an OS was poor. Part (b) proved to be the most challenging. There was still an adequate number of candidates who obtained a good result in this question.

Question 11

In part (a), Paper A candidates performed well in giving reasons why programs are written in a high level language and not a low level language. In part (b), few candidates were able to explain where low level could be used. In part (c), few candidates gave a correct reason why assembly language is preferred over machine code.

Question 12

For this question, candidates sitting for both options performed well and obtained remarkable results. The only sections that caused some difficulties were (c) and (d). The first parts (a) and (b) were straightforward and most candidates performed well.

Question 13

Candidates performed very well and obtained good results. Some of the candidates found difficulties in the conversion of numbers given in parts (a) (ii) and (iii).

Question 14

Candidates found great difficulties in the programming question as in previous years. Nearly a quarter of the candidates left this question unattempted.

Question 15

Most candidates were able to complete the flowchart with the statements provided. A few candidates' attempt to place the statements given in the flowchart diagram provided was inadequate.

Paper II

Question		1	2	3	4	5	Total
Max Mark		/17	/17	/17	/17	/17	/85
Paper IIA	Mean	11.3	9.8	12.3	8.4	9.6	51.4
	S.D.	3.2	4.1	3.2	4.8	3.5	15.0
	Facility Index	0.6	0.6	0.7	0.5	0.6	0.6
	Discrimination Index	0.7	0.8	0.8	0.9	0.8	-
Paper IIB	Mean	8.6	6.9	6.9	5.1	7.9	35.4
	S.D.	3.2	4.2	3.2	3.5	2.9	12.5
	Facility Index	0.5	0.4	0.4	0.3	0.5	0.4
	Discrimination Index	0.8	0.7	0.8	0.7	0.7	-

Table 3: Analysis of raw scores for Paper IIA and Paper IIB questions

Paper IIA

Question 1

- The majority of the candidates were familiar with intelligent applications and gave a good explanation. A few did not mention that records of individuals are stored in a database.
- A good number of candidates anticipated the right flow and gave the flowchart. However, some of them mixed up the tasks and made use of the incorrect symbols.
- In most cases, candidates expressed themselves well and gave the testing procedure to perform.
- The candidates could choose either a Yes or a No as an answer for this question. Most candidates were able to explain their choice.
- As has been the case in programming, candidates encountered a variety of difficulties and in most cases incorrect answers were given.
 - In most cases, answers were incorrect.
 - In most cases, the response was very poor. Only a few candidates noticed that the Java snippet did not compile due to the missing main method.
 - The majority of candidates' performance was inadequate.
 - Very few candidates understood the question and gave a correct result.
 - In this part of the question, a high percentage of the candidates answered correctly.

Question 2

- Most candidates were able to complete the truth table for the logic circuit given.
- Most candidates were able to draw the correct logic gate with output Y.
- In this part of the question, candidates encountered a variety of difficulties with some of them presenting different solutions. However, a large number gave an incorrect answer.
- Though one expected candidates to find difficulties to extract the Boolean expressions of outputs X and Y, candidates in most cases gave the correct Boolean expression for the output Y. However, through the responses, it was evident that the output X seemed to be more challenging.
- The question specifically asked for a 'binary arithmetic operation' and a number of candidates gave the answer - XOR operation, which is a 'logical operation' and therefore incorrect.

- f) The two's complement method presented different scenarios. The performance of several candidates was poor and thus couldn't distinguish the process and gave unclear responses.
- g) (i) Most of the candidates answered correctly.
(ii) There was a high percentage of incorrect responses. According to the responses, it is evident that candidates did not understand the question or left out part of the required process to obtain the decimal conversion.
- h) The majority of candidates answered correctly and explained well the operation.

Question 3

- a) Most candidates answered correctly. Some confused the term 'feature' with the term 'advantage'. Therefore, there were candidates who gave an advantage of a LAN rather than a feature.
- b) Candidates gave the correct advantages for a LAN.
- c) Candidates were asked to name a device which allows computers to access the internet and to explain its function. Many candidates named a MODEM as the device, which is correct. Others named routers which is also correct.
- d) Candidates did very well and obtained good results. The vast majority answered that 1000 MB is the preferred bandwidth because of speed, etc. However, no one had the opinion that since it's an insurance office of only 20 computers, 500 Mb bandwidth would be more than enough for the kind of work that the employed will be doing, hence reducing internet connection costs.
- e) In part (i), few candidates answered this question completely correct. In part (ii), very few gave at least one task that should be carried out before implementing the computer system. Those who gave a correct answer mentioned testing.
- f) Many candidates were able to explain the terms 'username and password' and 'encryption'. A few number of candidates were not able to explain the term 'encryption'. Many candidates were able to explain the terms 'log' but were unable to explain the term 'audit trail'. Some did not attempt this question.

Question 4

- a) Most candidates were able to demonstrate the difference between the mnemonics ADD and AND by using the two binary strings given.
- b) A selected number of candidates were aware that the result of an arithmetic and logical operation is stored in an Accumulator. Some candidates mentioned incorrect answers such as the IR register – Instruction Register, cache or storage devices.
- c) The performance of many candidates in distinguishing between a register and main memory was poor.
- d) Candidates encountered difficulties to describe the addressing modes used in assembly language. As has been the case for high-level languages, candidates did find difficulties and it was evident that the majority were not familiar with the mnemonics used.
- e) Though it was a challenging question, quite a number of candidates gave good answers. Most mistakes made in this question were for the last instruction where candidates had to perform an AND 104.

Question 5

- a) Most candidates performed the correct calculation and got the correct answer. However, there were a number of candidates who used the value of 1000 instead of 1024.

- b) In some cases candidates didn't distinguish well the main differences between a solid state drive and a magnetic storage.
- c) Candidates gave correct reasons and the devices to be used. The performance of some candidates in part (c) was inadequate because they did not realise that they had to choose between SSD and HDD (as specified in the context).
- d) Many candidates were able to identify a correct alternative storage by giving the correct reasons. In most cases candidates opted for the standard backups. Very limited ideas were provided.
- e) Good overall explanation.
- f) In most cases a correct response was given.
- g) A considerable number of candidates seemed to be unfamiliar with the term system utilities and gave the incorrect answer.

Paper IIB

Question 1

- a) In most of the cases, candidates completed the flowchart correctly.
- b) Although the majority managed to mention the input and output devices there were still a number of candidates who gave an incorrect answer.
- c) According to the responses, it was evident that candidates were unable to apply their knowledge and understanding of java to answer the questions set on the program snippet provided. Very few candidates were able to describe what causes a runtime error, and to provide the correct programming lines that describe a program construct. Most of the candidates that attempted this question knew what a logical error is, however were unable to write a single line of code that could have fixed the logical error.

Question 2

- a) The absolute majority of candidates identified the logic gates as AND & OR.
- b) The truth tables in most cases were correct.
- c) Only a few were able to complete the truth table of the logic circuit provided.
- d) Nobody answered this question entirely correct. The majority stated No but a correct reason behind it was not given.
- e) Only a few candidates stated correctly, what needs to be changed for the circuit to work correctly.
- f) Since most answered part (e) incorrect, they also answered this part of the question incorrect since it is a continuation of the previous question.
- g) Only a few candidates were able to perform well logical operations, conversions from binary to decimal and shift operations. Some candidates left most parts of this question unattempted.

Question 3

- a) Most candidates gave a correct answer for the acronym LAN.
- b) A number of candidates confused the term 'feature' with 'advantage'.
- c) Very few candidates gave two advantages of using a LAN rather than standalone computers.
- d) (i) The majority of the candidates did not explain the function of a modem adequately.
(ii) Most candidates gave at least one correct use of the Internet for the company.

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- e) (i) & (ii) The majority answered correctly, what WWW stands for but very few candidates gave a correct answer for URL.
- f) (i) Nobody was able to state the name for the first stage of the SDLC.
(ii) Very few candidates gave a correct task that the system analyst does during the first stage of the SDLC.
(iii) Very few candidates gave a correct answer why system maintenance is important.
- g) (i) The minority of candidates explained what a direct changeover means.
(ii) Since this was a continuation of part (g) (i) almost the same candidates gave a correct answer.

Question 4

- a) The absolute majority were aware what the term CPU stands for.
- b) A small number of candidates stated the two main units which make up the CPU
- c) Only few of those candidates that answered part (b) correctly answered this part correctly.
- d) Very few candidates mentioned the ALU.
- e) Very few candidates were able to identify the two statements out of a set of statements that were false and to give the correct statement.
- f) Most candidates were unable to draw a typical diagram of a CPU.
- g) A good number of candidates were unable to provide the correct terms for the fill in the blanks. Some candidates left this question unattempted.

Question 5

- a) Most of the candidates gave poor answers and very few managed to answer correctly.
- b) According to the responses, it was evident that the majority of the candidates did not know what a Graphical User Interface (GUI) is.
- c) Few candidates gave a correct answer for this question.
- d) A good number of candidates were unable to give reasons why an SD card is a better storage than a magnetic one.
- e) The majority of the candidates gave a good explanation for the importance of backups.
- f) In most cases candidates gave correct answers.
- g) Very few candidates mentioned a software utility but some of them did not explain what the utility does.
- h) A decent amount of candidates answered this question correctly.
- i) The performance of the candidates who answered this question was insufficient, as they selected that a tablet is a general-purpose computer system but did not give a reason why it is a general-purpose system.

Chairperson

Examination Panel 2020