L-Università ta' Malta

MATSEC
Examinations Board

Examiners' Report

SEC Computing

Main Session 2022

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A. STATISTICAL INFORMATION

The total number of candidates who registered to sit for Computing was 639, which is 111 candidates less than in 2021. Of these registrations, 488 opted for Paper IIA and 151 opted for Paper IIB.

Table 1 shows the distribution of grades for the May 2022 Session of the examination.

GRADE	1	2	3	4	5	6	7	U	ABS	TOTAL
PAPER A	46	101	137	122	32	-	-	40	10	488
PAPER B	-	-	-	36	16	24	14	32	29	151
TOTAL	46	101	137	158	48	24	14	72	39	639
% OF TOTAL	7.2	15.8	21.4	24.7	7.5	3.8	2.2	11.3	6.1	100.0

Table 1: Distribution of grades for SEC Computing 2022, Main Session

B. GENERAL REMARKS

General Remarks on Coursework

The examiners moderated a total of 160 projects in 9 state, church, and independent schools. 5 candidates had their mark reduced by four marks. In addition, 18 projects submitted by private candidates were corrected and, each were called for an interview.

The examiners highlighted that, overall, most of the work submitted by private candidates was up to SEC standard and the marks achieved were very good. Three private candidates performed poorly in the interview and another candidate presented a coursework which was not compliant with the syllabus.

The following remarks reflect comments made by the moderators:

- The moderated work was generally of the indicated quality, suggesting hard work by most educators and candidates.
- Candidates should be encouraged to choose a project themselves. There were several classes in which candidates did the same project and had very similar documentation layouts.
- Candidates should be guided better to refer to the right features in their code when it comes to the Special Features section in the documentation.
- Candidates should be encouraged to list and explain features that could be possibly improved or included to improve the program outcomes.
- The algorithm (flowchart or pseudocode) is the section which resulted to be most challenging. The use of the correct flowchart symbols, being complete, readable, and easy-to-follow algorithm are tasks that should be addressed better. The flowchart development needs to be split in sections so that there is a clear understanding of the task being implemented.
- The plan of test data should be made in a logical way to test the program sections and not only one section of the program, such as the main menu. This will assist to improve the program and where applicable modify program segments.

General Remarks on the Written Examination

Throughout both papers, candidates were required to demonstrate ability in all areas of the syllabus. Most candidates gave good responses when recall and comprehension questions were asked. On the other hand, responses indicate that the majority of the candidates found application of knowledge type of questions more challenging, especially candidates who opted for Paper 2B.

C. COMMENTS ON PAPER I AND PAPER II

Paper I

Question		1	2	3	4	5	6	7	8	9	10	Total
Max Mark		4	9	10	10	10	8	5	13	6	10	/85
Paper 2A	Mean	2.9	5.7	7.7	7.9	8.5	7.1	3.8	8.9	4.4	5.8	60.7
	Standard Deviation	0.9	1.9	1.6	1.8	1.4	1.8	1.3	2.8	1.1	2.9	15.5
	Facility Index	0.7	0.6	0.8	0.8	0.8	0.9	0.8	0.7	0.7	0.6	0.7
	Discrimination Index	0.4	0.7	0.4	0.6	0.7	0.6	0.5	0.8	0.4	0.8	-
Paper 2B	Mean	2.6	3.5	6.6	6.2	7.0	4.3	3.1	5.4	3.4	2.2	43.8
	Standard Deviation	1.0	1.8	1.9	2.0	1.5	3.3	1.3	3.4	1.3	2.2	13.4
	Facility Index	0.7	0.4	0.7	0.6	0.7	0.5	0.6	0.4	0.6	0.2	0.5
	Discrimination Index	0.5	0.7	0.6	0.7	0.7	0.7	0.4	0.9	0.5	0.7	-

Table 2: Analysis of raw scores for Paper I 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, most Paper IIA candidates got –0.9 and +0.9 from the mean; a score between ~2 and ~3.8 in Question 1 Paper 1. The Facility Index is a measure of how easy or difficult is a question in an exam. Questions 2 and 10 for Paper IIA candidates proved to be the most difficult in Paper I. For Paper IIB candidates, question 10 was the most difficult followed by questions 2 and 8. 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

a) Many candidates were able to identify the applications. However, the attempt to answer part (ii) was inadequate. Several candidates stated that HTML is the application software used to create a web page.
b) Most candidates were able to identify the system utility to prevent from receiving malware.

Question 2

a) Many candidates correctly associated 2.6 GHz with the speed of the CPU. However, only a few candidates explained its meaning.
b)
   i. Most candidates gave the correct acronym of the term RAM.
   ii. Even though many candidates gave the correct characteristics of RAM, a significant number of candidates mentioned only that is 'volatile'.

iii. Most candidates answered correctly. However, a significant number of candidates mentioned only that the system will be 'faster' without specifying that it will improve the running of the applications. Some other incorrect answers related to an increase storage space.

c)

i. The majority of candidates gave a valid reason for sending a low-resolution photo rather than high-resolution image.

ii. Only a few candidates managed to calculate correctly the maximum storage space needed to store the photos.

iii. Most candidates gave the correct system utility required to send photos as an email attachment. It was noted that the most common incorrect answer was GMAIL.

Question 3

a) Many candidates were able to identify the correct input/output devices and their use in the scenario given but some candidates did not use the given scenario and used generic examples.

b)

i. Most of the candidates provided a correct reason for using a file server.

ii. Some candidates identified that the magnetic storage is better and justified their answer properly. Other candidates identified magnetic storage but without specifying a reason. A few candidates chose optical with/out explanation.

iii. The majority of candidates provided a valid storage device to save a 5-minute video footage.

Question 4

a) Most candidates provided a correct application. Mostly mentioned DBMS and Ms. Access. Some candidates incorrectly mentioned Excel or Spreadsheet.

b) In this question there was an equal proportion of candidates who identified the correct primary key and its data type, those who identified the primary key correctly but not the data type, and others who identified the primary key incorrectly.

c) Most candidates answered this part correctly. There were a few candidates' responses that showed a poor understanding of the term relationships in Databases.

d) Most candidates answered this question adequately.

Question 5

This question presented several multiple-choice answer types of sub questions. Overall, the candidates performed very well. There was an error in part (h) whereby RAM should have been given instead of ROM. Thus, marks for this part of this question were awarded to all candidates.

Question 6

Most candidates answered this question correctly. Responses indicate that the candidates who did not identify the logic gates, performed very poorly in the truth table.

Question 7

Most candidates performed adequately. Responses indicate that some candidates confused between the functions of File Management and Memory Management OS.

Question 8

a) Responses indicate lack of application of knowledge. Most candidates were unable to identify an analogue data and a digital data from the given scenario.
b) Most candidates answered correctly and provided a suitable explanation.
c) A significant number of candidates related flowchart symbol in part (c) (i) as a process construct.
d) The performance of most candidates was inadequate.
e) Responses indicate that most candidates were aware that the FOR Loop is not ideal in the presented scenario. However, only a few included a correct justification.
f) Overall, the candidates explained the function of the algorithm well.

Question 9

a) Most of the candidates' attempt to provide a correct reason was insufficient. Some candidates provided a variety of good answers, even though the reason was not clearly expressed.
b) Most candidates mentioned a correct method to log on to a system. However, very few candidates mentioned biometrics.
c) Most candidates answered correctly. Some incorrect included were antivirus and encryption.
d) Most candidates managed to answer this question adequately.
e) Most candidates managed to answer this question adequately. A common incorrect answer was switching off the computer.

Question 10

Overall, most the candidates' responses showed a lack of understanding and knowledge of the Java programming language, and programming in general. Whereas most candidates were able to identify a suitable datatype for part (a), only a few managed to answer properly all or part of the remaining sub-questions. Some candidates, mostly Paper 2B candidates, did not attempt the sub-questions.

Paper II

Question		1	2	3	4	5	Total
Paper 2A	**Max Mark**	**16**	**16**	**19**	**17**	**17**	**/85**
	Mean	8.1	10.0	9.4	9.8	9.5	46.8
	Standard Deviation	3.4	3.8	5.4	4.1	3.7	16.6
	Facility Index	0.5	0.6	0.5	0.6	0.6	0.6
	Discrimination Index	0.8	0.8	0.9	0.8	0.8	-
Paper 2B	**Max Mark**	**14**	**15**	**20**	**20**	**16**	**/85**
	Mean	5.6	7.5	6.3	9.9	7.5	36.8
	Standard Deviation	3.2	3.3	5.1	4.3	3.6	15.7
	Facility Index	0.4	0.5	0.3	0.5	0.5	0.4
	Discrimination Index	0.8	0.8	0.9	0.9	0.7	-

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

Paper 2A

Question 1

a. Most candidates answered correctly but the attempt to justify their answer was inadequate.
b. Most candidates answered correctly but the attempt to justify their answer was inadequate. In some cases, the candidates' responses showed a lack of understanding of the differences between High-Level and Low-Level Languages.
c. Most candidates answered correctly the first three sections (i, ii, iii) of this question. Responses indicate that most candidates performed adequately in part (iv). However, responses also indicate that the attempt to provide a good explanation of the function of the code snippet and consequently the one line of JAVA code was insufficient.
d. Most candidates answered correctly. A common incorrect answer was modem.

Question 2

This question presented a scenario involving Hexadecimal colour codes and a digital thermometer to assess the candidates about number systems and arithmetic, as well as problem solving through flowcharts. Most candidates answered the entire question correctly, except for part d (i) in which only few candidates performed the Two's Complement calculation properly or provided the answer in the appropriate format.

Question 3

A significant number of candidates managed to properly answer the first three sections of this question. The attempt of some other candidates to extract the Boolean expression was inadequate, thus performing poorly in parts (b) and (c). The attempt of most candidates to answer the rest of the question, was adequate. However, the performance in parts d (iv) and d (vi), was inadequate whereby most candidates provided the entire F&E steps rather than a brief description of it.

Question 4

a) Most candidates performed adequately.
b) Most candidates performed adequately.
c) A good number of candidates answered correctly. However, other candidates stated 'Control and Review' as their answer which might indicate a misconception that testing is done only at the end of the development life cycle.
d) A good number of candidates answered correctly. However, other candidates' responses indicate a lack of ability to differentiate between the different types of documentations.
e) Overall candidates answered correctly. However, there were some instances in which candidates confused the Implementation phase with the Changeover phase.
f) While most of the candidates answered the first two sections of this question properly, their responses to parts (iii) and (iv) indicates poor programming skills.
g) Most candidates performed adequately.

Question 5

a) Most candidates answered correctly. However, a considerable number of candidates referred to a network as several computers connected together over the internet. This might indicate that candidates relate networks to the internet and overlook the fact that a network can exist without internet.
b) Most of the candidates provided the correct term for the acronyms LAN and WLAN and gave the correct advantage of LAN over WLAN.
c) Most candidates answered correctly.
d) Most candidates answered correctly but only few candidates explained the function of a MODEM.
e) Few candidates gave the complete correct answer.
f) Few candidates managed to provide one factor that affects connection performance in a WAN.

Paper 2B

Question 1

a) Most candidates performed adequately.
b) Many candidates performed adequately.
c) Only a few candidates managed to provide the correct characteristics for low-level languages.
d) Many candidates managed to provide the correct characteristics of a high-level languages.
e) A good number of candidates provided a correct answer. However, it was evident that most of the candidates found it difficult to express themselves and to provide an example of a syntax error.
f) Most candidates performed adequately.

Question 2

a) Most of the candidates answered this question properly. However, in most cases, the working was not shown.
b) Only a few candidates performed adequately. Responses indicate that most of the candidates encountered difficulties in converting hexadecimal to decimal.
c) A good number of candidates did not attempt this part. Those who attempted it, did not include a justification.
d) Most of the candidates managed to properly label the different sections of the flowchart.
e) Most of the candidates answered this question properly. However, an explanation was not given.
f) Responses indicate a lack of understanding of standard character coding representation, including ASCII and the purpose of such a standard.

Question 3

Overall, most candidates did not attempt most parts of the question.

a) In most cases the two missing gates were identified.
b) Candidates who identified the gates, completed the truth table correctly.
c) The performance of almost all candidates was very poor.
    i. Most candidates found difficulties to provide an explanation of the purpose of the CU and ALU.
    ii. Very few candidates answered the question correctly. Responses indicate a lack of knowledge about the architecture of a processor. Thus, difficulties in attempting the rest of the parts of this question were noted.
    iii. Most of the candidates did not distinguish between the buses properly.
    iv. Overall, very poor performance was noted.
    v. Responses indicate that this part of the question was challenging to almost all candidates.
    vi. Very few candidates showed an understanding of the fetch and execute cycle.

Question 4

a) Most candidates found difficulty in explaining the role of a Systems Analyst.
b) Most candidates chose the correct answers.
c) Responses indicate a poor understanding of the System Development Life Cycle in general.
d) Most of the candidates answered correctly and were able to differentiate among the documentations.
e) Most of the candidates did not attempt this part of the question. The few candidates who attempted this question performed poor.
f) Most of the candidates left this part unattempt or provided incorrect answers.

Question 5

a) Most candidates defined the term network correctly.
b) Most candidates provided a correct answer, except for the term WLAN which many interchanged with WAN.
c) Most candidates performed adequately.
d) Only a few candidates answered correctly and correctly provided two uses of the Internet.
e) Some of the candidates provided a correct answer but only a few managed to explain the purpose of a MODEM.
f) Overall, most of the candidates gave a correct answer. Responses indicate that the most challenging part was to explain why encryption is not a data-integrity measure.

Chairperson
Examination panel 2022