L-Università ta' Malta

Examiners' Report

IM Computing

First Session 2023

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A. STATISTICAL INFORMATION

A total of **71** candidates applied for the May 2023 Intermediate Computing examination session.

The weight of the written component is 80% of the global examination mark while the remaining 20% is carried by the coursework exercise.

50 candidates sat for the written exam. **21** candidates were absent for the exam sitting.

A coursework project was also required for this session. **45** submitted the project. **26** candidates did not submit a project. **5** of these candidates sat for the exam but did not submit the project. There were no candidates who presented the coursework but were absent for the written paper.

For this session, the mean mark for the written paper was **44.4** (out of a maximum of 80) while that of the coursework was **15.7** (out of a maximum of 20). Chart 1 and Table 1 below show the distribution of the global marks (written paper plus coursework) as scored by the candidates.
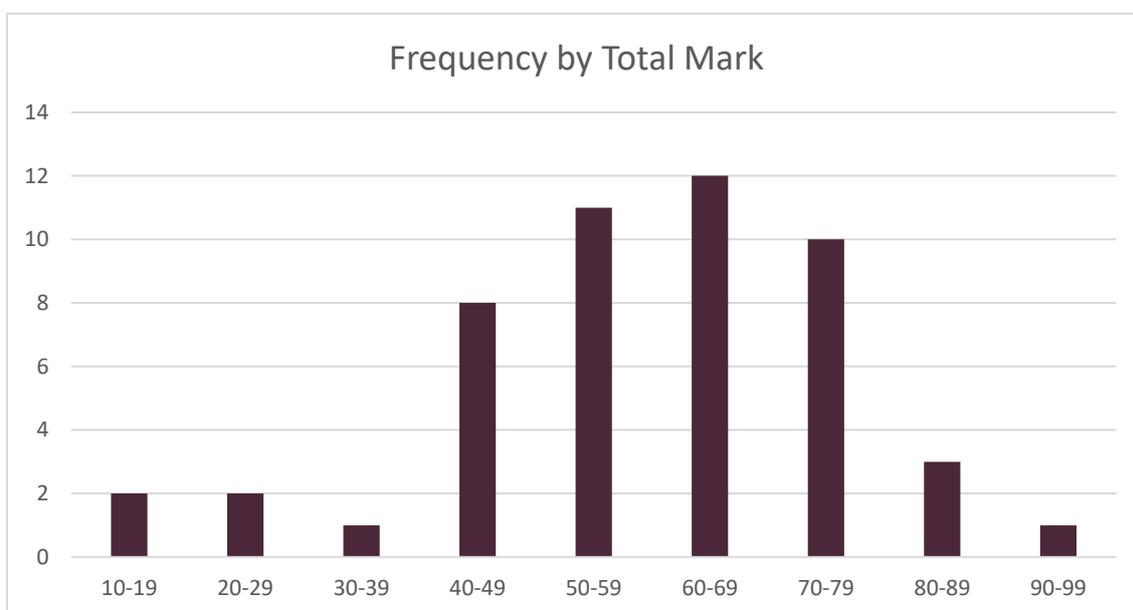
Chart 1

Table 1

Class Intervals	Frequency
10 – 19	2
20 – 29	2
30 – 39	1
40 – 49	8
50 – 59	11
60 – 69	12
70 – 79	10
80 – 89	3
90 – 100	1

Table 2 below shows the grades obtained by the candidates and the percentage of each grade.

Table 2

Grade	A	B	C	D	E	F	Absent	TOTAL
Number of Candidates	4	6	21	11	3	5	21	**71**
Percentage of Candidates	5.6%	8.5%	29.6%	15.5%	4.2%	7.0%	29.6%	**100%**

B. GENERAL REMARKS

General Remarks on Coursework

During the coursework moderation exercise, the moderators visited all the colleges that prepared candidates for this examination session.

The moderators' feedback was that, in all colleges, the marks allotted by the tutors were fair and therefore these marks were retained. All private candidates were asked to attend for an interview regarding the coursework they presented to the board.

General Remarks on the Written Examination

Table 3 below shows the Maximum mark that could be scored for each of the 12 items in the written paper, the Mean mark scored and the Standard Deviation for each item. The table also shows the Facility Index for each item – the index may range from 0, for an item in which candidates obtained 0 marks, to 1.0 for an item in which all candidates scored full marks.

Table 3

Item Number	Maximum Mark	Mean	Standard Deviation	Facility Index	Choice Index *
A1	6	3.2	1.3	0.5	
A2	6	3.2	1.5	0.5	
A3	6	3.7	1.5	0.6	
A4	6	3.8	1.5	0.6	
A5	6	4.4	1.3	0.7	
A6	6	3.3	1.4	0.6	
A7	6	3.9	2.1	0.6	
A8	6	3.1	1.7	0.5	
A9	6	1.8	1.6	0.3	
A10	6	2.2	1.5	0.4	
B1	20	12.5	4.5	0.6	0.68
B2	20	10.7	4.4	0.5	0.32

*The Choice Index given usually in the table above is a measure of the popularity of an item – an index of 0 indicates that an item was not chosen by any candidate; while an index of 1.0 shows that an item was selected by all candidates. The choice index only applies to the two items in Section B because the items in Section A are compulsory.

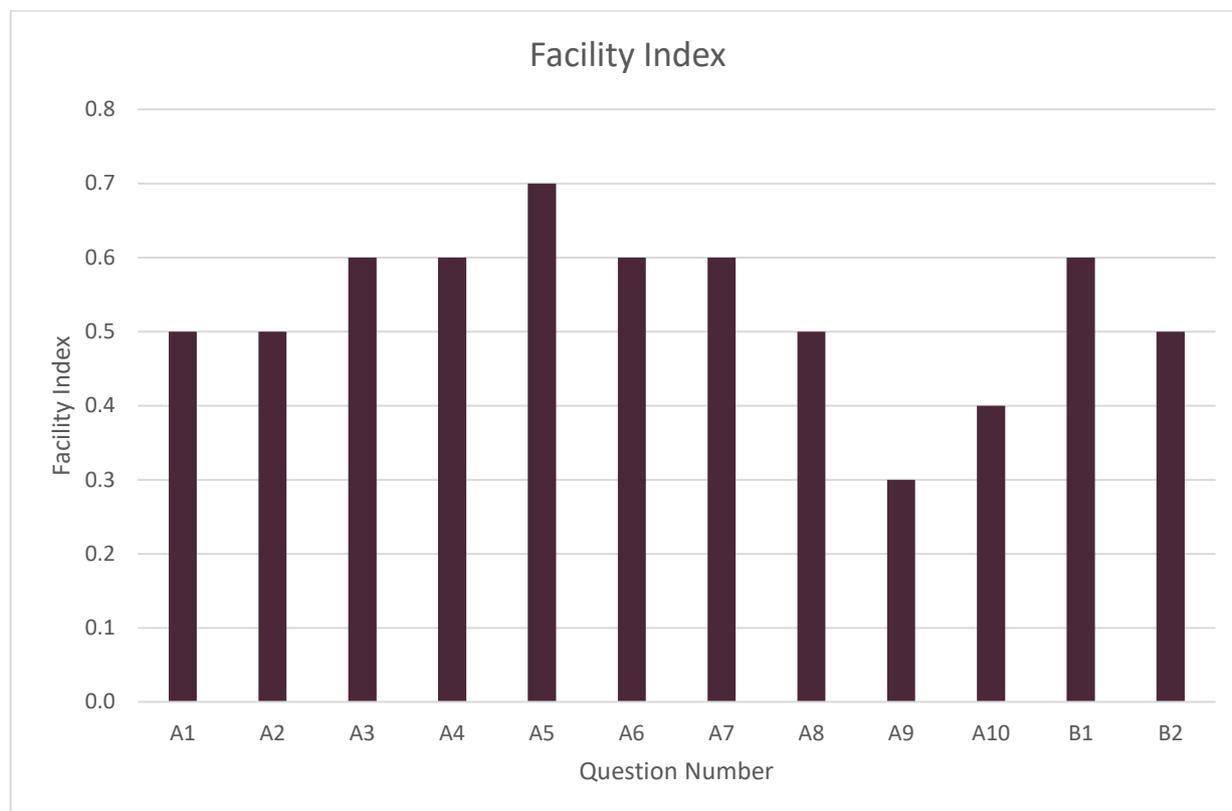Chart 2 below shows the Facility Indices in graphical format.

Chart 2

Table 4 below shows the items in decreasing order of facility, together with the topic that the item tested.

Table 4

Item Number	Facility Index	Topic Tested
A9	0.3	Given a case study - drawing of a context diagram, identification of type of maintenance required, and naming of an applicable UML diagram.
A10	0.4	Array as a data structure, advantage and disadvantage of array vs list, accessing array values, array type applicable for storing a given 2-D table, array declaration syntax.
A1	0.5	Operating Systems – reasons for not always upgrading to newer versions, Windows not batch processing, scheduling approaches, deadlock in multiple threads, memory protection in memory management.
A2	0.5	Analog vs digital communication, electrical data transmission cable type, minimisation of noise in chosen cable type, coaxial vs fibre for last part of network, amplitude vs frequency modulation.
A8	0.5	Given an assembly language code snippet – identification of operand and opcode, direct and immediate addressing instructions. Naming of another addressing mode. State of one register following execution of given code.

B2	0.5	Given a set of processor specifications - explain relationship of word length to processor performance, address bus size to system performance. Define functions of memory management, logical and physical addresses. Explain role of the Memory Data Register and the Memory Address Register. Explain relationship of high-level languages to CPU function, platform independence of object code, name role of a translator other than compiler and compare, associate linker and loader with respective roles. Given an assembly code snippet – to identify a mnemonic, label declaration, instruction referring to a label, state changes of registers during execution of the code snippet, overall function of the code snippet, equivalent of code in Java.
A3	0.6	Given a Java program segment with array, loop and conditional. Questions on method calling format, array declaration, benefit of encapsulation for security features, benefit of OOP to productivity, benefits of e-Commerce to suppliers and role of internet in each case.
A4	0.6	Given a small Java program with loop, conditional statements and counting. Questions on flowchart. Given additional statements to complete certain instructions, logical positioning of a given instruction.
A6	0.6	Advantage of e-commerce to consumers. Disadvantages of remote working. Applicability of message and circuit switching protocols.
A7	0.6	Boolean Algebra – simplification of expression, drawing of logic circuit, application of laws to Boolean expressions.
B1	0.6	Truth table completion, Karnaugh Map generation, logic expression minimisation, logic circuit drawing using NAND gates. Given a database design requirement - identification of table, fields, data types, field sizes, primary and foreign keys. Outline benefits of relational database, definition of data dictionary and role of database administrator, definition of query language and how used in given case.
A5	0.7	Given a network implementation project, choose between star vs bus LAN Network layouts. Contrast PAN vs LAN and name devices connectable via PAN. Data protection responsibilities related to biometric data collected via portable devices.

C. COMMENTS PER QUESTION

Section A

Generic comment:

The presentation of some candidate's work was remarkably careless. In some instances, parts of some answers were completely illegible, impacting the awarded mark. Some candidates also tended to stagger their answers sub-questions all over the booklet without adequately clarifying this on the coversheet, hence for instance one may find a one-line answer to a sub-question of one question between answers to other question. This was combined with poor numbering and often hard to decipher handwriting.

Question 1

Part (a) of this question was generally well-answered with respondents giving acceptable responses e.g., user hesitancy of new versions as these may be viewed to be unreliable. Generally, candidates correctly answered part (b) in the negative. However, in some cases the explanation was unrelated to the fact that Windows is required to respond interactively, which batch processing does not allow for. Part (c) was generally correctly answered. In part (d) quite a lot of candidates incorrectly explained deadlock as two processes requiring the same resource. Some candidates lost marks in part (e) as they answered about memory management generically.

Question 2

This question was generally correctly answered. In part (b) a good percentage of candidates replied 'fiber optic'. At times, in part (c), very brief answers which implied, rather than gave, answers (e.g., 'put underground') lost candidates marks. In part (d) (ii) candidates who answered incorrectly tended to answer that coaxial is faster or more reliable. Part (e) of this question was also generally correctly answered, however very brief, incomplete answers cost some candidates marks (e.g., 'amplitude modulation varies amplitude and frequency modulation varies frequency').

Question 3

This question was generally correctly answered. In part (b), however, quite a sizeable number of candidates lost part or all marks here, showing an inability to declare an array. Some marks were lost in part (d) for lack of detail with answers that failed to allude to child classes inheriting methods and properties.

Question 4

This question was generally correctly answered. In part (a), however, a few respondents did not seem to know what flowcharts are and produced the algorithm in diagrammatic form. In part (b) (i) where there were any, the mistakes generally pertained to line 49.

Question 5

This question was generally correctly answered. In some cases, answers to part (b) (i) were somewhat vague: e.g. 'PAN is found in the house and LAN is found in an office'. Some candidates lost marks in part (c) for poorly explained answers or wording the same responsibility in different words.

Question 6

Most of the candidates did not read part (a) (ii) correctly as they just assumed that the disadvantages were for e-Commerce, whereas the disadvantages referred to remote working. Most candidates also lost marks in part (b) of the question since answers were given as "simplex, half duplex or full duplex".

Question 7

Candidates lost most of the marks in part (c) of the question. It could be seen that they had no knowledge on said laws.

Question 8

Most of the candidates mixed up the addressing modes in part (b) of the question.

Question 9

Only a few of the candidates managed to gain marks in this question. Responses indicated that the candidates lacked knowledge of DFDs. Some even drew a hybrid of a DFD and a use-case Diagram. Candidates showed also a lack of knowledge of what UML diagrams were.

Question 10

There were only a couple of candidates who managed to answer this question correctly showing that the candidates had no understanding of what a two-dimensional array is. Most candidates assumed that list in part (b) of the question referred to an array list. They were given the benefit of the doubt and a mark was still awarded.

Section B

Question B1

Relatively well answered apart from the last part (g) where it could be seen that the candidates were not that confident with queries.

Question B2

In part (a) quite a few candidates remained vague using terms like 'more efficient' but not clearly explaining why. Part (b) was generally correctly answered. Part (c) was generally correctly answered, however some candidates failed to mention that these were used when the CPU is accessing main memory.

Part (d) (i) was generally correctly answered. Most candidates had valid answers for parts (d) (ii) and (d) (iii) but some lost marks for vaguely stating their points e.g., failing to link object code being platform specific to the instruction set; failing to point out that an interpreter does not produce object code.

Part (e) was generally correctly answered; however, a sizeable number of candidates answered the part (e) (i) on the loader correctly but gave the wrong answer for 'linker' in part (e) (ii). Part (f) was generally correctly answered except for part (f) (iii) which was generally poorly or incorrectly answered.

Chairperson
Examiners Panel 2023