

UNIVERSITY OF MALTA
SECONDARY EDUCATION CERTIFICATE
SEC

TECHNICAL DESIGN

May 2006

EXAMINERS' REPORT

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD

**SEC Technical Design
May 2006 Session
Examiners' Report**

Part 1: Statistical Information

The table below shows the distribution of grades for May 2006 session.

TABLE 1. GRAPHICAL COMMUNICATION

Grade	1	2	3	4	5	6	7	U	Abs	Total
Paper A	35	68	107	104	64	-	-	61	4	443
Paper B	-	-	-	53	115	100	20	6	18	312
Total	35	68	107	157	179	100	20	67	22	755
% of Total	4.64	9.01	14.17	20.80	23.71	13.25	2.65	8.87	2.91	100%

546 candidates obtained grades 1 to 5 = 72.32%

666 candidates obtained grades 1 to 7 = 88.21%

TECHNOLOGY OPTIONS A & B

Only three candidates opted for Paper A. The three candidates were absent for both papers. Nine candidates opted for Paper B. Seven candidates were absent for both papers. The other two candidates obtained a grade 5.

Part 2: Comments regarding performance**2.1 GENERAL COMMENTS**

The Technical Design SEC examination consisted of a common core Paper 1 that had to be answered by all candidates and a Paper 2 consisting of a choice between two options: the Graphical Communication option and the Technology option.

Paper 2, in both options, were set at two levels: A and B. Paper A is more demanding in content level than Paper B. Paper 1 carried 60% of the total mark, whilst Paper 2 carried 40% of the total mark. Candidates had to answer all six questions in both papers.

Considering only the marks obtained in the Common Core Paper (Paper I) and before the marks are reduced to 60% it is to be noted that only 1% of the 735 candidates present for Paper I obtained less than 10 marks. In 2005, 6% of the 690 candidates present for Paper I, obtained less than 10 marks, whilst in 2004, 20% of the 706 candidates present for Paper I obtained less than 10 marks. This seems to indicate that fewer candidates with a

very low level of Technical Design are opting to sit for this examination and consequently the success rate has been substantially improved.

Just like previous years it has to be noted that some candidates are opting for the Paper B Option, rather than for the Paper A Option, and consequently they are failing to realize their full designing capabilities.

2.2 THE COMMON CORE PAPER 1.

- Q1.** The question concerned the construction of a locus of the end tip of a rod. The majority of the candidates did well in this question achieving more than half the total marks. Most candidates however, failed to consider adequately, the region in the immediate vicinity of B on the semi-elliptical path which gave rise to the highest part of the required locus.
- Q2.** The question concerned finding the floor area of a recreation space using the mid-ordinate method. Only a very small minority satisfied the examiners. Most candidates had no knowledge of the mid-ordinate method and attempted the question by dividing the recreation space into squares of nominal area. These answers could not be credited. This question clearly shows that certain basic concepts in Technical design are being totally ignored in fact from the 730 candidates who sat for Paper I, 516 (71%) failed to obtain a single mark.
- Q3.** The question consisted of drawing an oblique projection, from the given two orthographic views, of a machined block. The drawing was presented in a scale of 1:2 whilst it was to be drawn to a full size scale.
More than 60% of the candidates obtained more than half the marks whilst about 11% obtained nearly full marks.
Some of the candidates had difficulty with the construction of the quarter of an ellipse.
- Q4.** The question involved a basic exercise in the geometrical production of arcs. Most of the candidates obtained a very good mark for this question. Quite a few candidates lacked the ability of producing good and neat compass work.
- Q5.** This question consisted of the drawing of a plan from the two given views in orthographic projection. The majority of the candidates presented a good solution of this question. A number of candidates found difficulty in producing the semi-circular groove as seen in the plan.
- Q6.** Three orthographic views of a machined component were given in this question. The candidates had to draw a freehand isometric drawing.
The great majority of the candidates obtained very good marks for this question. Some of the candidates did not understand that the given base of the crate enclosed the whole component even though it was so stated in the question. It was

quite evident that some candidates lacked the ability to produce neat and well proportioned freehand drawings.

2.3 GRAPHICAL COMMUNICATION PAPER 2A – 2B.

- Q1. 2A** The question involved completing a decorative geometrical pattern. Despite the use of the phrase 'By construction' in the wording of the question, some candidates tried to draw the pattern freehand! Other candidates assumed the centre of the larger arcs, without any constructional work whatsoever. Others even had difficulty transferring the given centre for the smaller arcs, into the top corner area of the equilateral triangle.
- Q1. 2B** The question involved completing the other half of a decorative pattern. Most answers were satisfactory, with some candidates scoring even full marks. On the other hand, some candidates chose to ignore the colouring part, losing precious marks.
- Q2. 2A** The question featured the design of two ideograms, one concerning glass bottles and jars and another concerning neon tubes and electrical bulbs. Although this kind of question appears repeatedly in this exam, many candidates still fail to appreciate the basic features that make a good sign, namely:
- the overall sign shape and layout
 - the use of proportionate peripheral border.
- Q2. 2B** The question featured the design of a sign. The candidates were offered a choice and the majority preferred to represent the prohibited display of frying oil into the kitchen sink. Poorly – scoring answers missed to adopt a suitable sign layout using big, clear representative symbols that are easily read from a distance. The ideograms were expected to be the focal point of an overall sign that employed an appropriate selection of colours.
- Q3. 2A** This question involved the construction of a semi-ellipse and its normal. The position of the focus and the length of the minor axis were given. The candidate had to establish the length of the major axis and then construct geometrically the semi-ellipse. Some candidates failed to judge and position the length of the major axis on the vertical centre line, others mistook the position of the focus as the length of the minor axis.

- Q3. 2B** The construction of a semi-ellipse on a marked minor axis **m-m** and a major axis of 170mm was requested. Some candidates used the given points **m-m** as the major axis and created a wrong minor axis. The second part of the question was completely ignored by the majority of the candidates. All that was requested in the second part of the question was the location of the foci and the construction of the tangent/normal to the ellipse at the point marked **X**. The use of construction lines to draw the ellipse left much to be desired, they were either too thick, bold or barely visible. Construction of the ellipse by the Concentric/Auxiliary Circle method was the most common method used. The other methods were incorrectly presented.
- Q4. 2A-2B** This question involved an electrical circuit. Copying the electrical symbols seemed to be easy and straight forward for the candidates. Connecting the circuit caused problems for most candidates. Some circuits were presented in a crude and clumsy manner. A positive note was that some candidates used red and blue coloured lines to connect the circuit, others represented the *positive* by a bold line and the *negative* by a thin line.
- Q5. 2A-2B** A fairly easy and familiar question involving the interpenetration of a prism to a cylinder. Candidates had to take a number of construction lines, project these lines orthographically on the three views and locate the point of intersection. The intersection points had then to be joined by a smooth curve. All candidates seemed to be aware that they had to draw the projection lines, but some failed to make use of the 45° line. The curve of intersection was at times drawn without the necessary construction lines. The part surface development was at times forgotten completely either because of the lack of knowledge of development or because candidates failed to read the question properly and were thus unaware that they had to construct a part development to finish the question. Some solutions were incorrect because the true width was not measured accurately.
- Q6. 2A-2B** In this question the candidates were given an auxiliary elevation and an incomplete plan. The completion of the plan and the projection of a front elevation were requested. The majority of the candidates managed to solve the first step that is the production of the projection lines from the auxiliary elevation to the plan and then to erect vertical lines to the front elevation. The second and final stage of the question, that is the transferring of the height from the auxiliary elevation to the front elevation, seemed to cause most of the mistakes. The candidates should number the projection points accordingly. It is also to be noted that many candidates did not leave the construction details showing and most of those who did, did so in a very untidy manner.

Chairperson
Board of Examiners
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