

EXAMINERS' REPORT

AM ENGINEERING DRAWING

FIRST SESSION 2018



**L-Università
ta' Malta**

**MATSEC
Examinations Board**

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General Statistics

The distribution of grades awarded in the May 2018 session are provided in the table below:

Table 1: Distribution of grades awarded in May 2018.

GRADE	A	B	C	D	E	F	abs	TOTAL
NUMBER	0	0	1	0	0	0	0	1
% OF TOTAL	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100

"Paper 1 is common to both Graphical Communication (AM 15) and Engineering Drawing (AM09). It consists of six questions of which the candidates are required to answer any five. All questions carry equal marks. All questions are to be answered on the provided A2 size sheets".

The overall number of candidates sitting for this examination is steadily decreasing. During the past years, centres obviously encouraged candidates to approach this examination seriously and devote adequate time both in class and at home to drawing and designing skills. Examiners can reasonably expect that, after a two-year course, the candidates show signs of genuine confidence and knowledge of ISO standards. This year, the general performance of the candidates was rather weaker to previous years. The panel wishes to encourage candidates to draw exploratory sketches at the top of the drawing sheet before attempting to start the solution. This method will give candidates an indication on whether to go ahead or not, and, if positive, how to lay out the solution. These sketches are not to be erased as they are an evidence of the problem-solving process.

General Comments by Markers

PAPER 1

FIVE questions had to be attempted.

Question 1. Loaded Truss

Four parallel vertical loads were represented on a truss. Some candidates lost marks for using inappropriate types of lines when copying the space diagram, drawing the load line and the bending moment diagram. Ignorance of the sensible application of 'Bow's notation' was often evident on the solutions. The majority of the candidates satisfied the second part of the question by presenting the polar diagram and applying the link lines to obtain the bending moment diagram. The left and right reactions were correctly stated and obtained by using a graphical method. Markers noted that, on some solutions, the polar diagram and the funicular diagram were superimposed on each other. This could have been easily avoided by careful planning as there is enough space on the A2 drawing sheet. The stress diagram stating the force and nature in the vertical member was not answered by a good number of the candidates.

Candidates' performance re-question 1.

	1 to 9 marks	10 to 19 marks	Full marks
Eng. Drg. & Gr. Comm.	3	7	1

Question 2. The first and second auxiliary view

A line in space heading in the direction of a triangular plate was illustrated. Two dimensioned views showing the position of the line and the triangular plate were also included. A first auxiliary view showing the plate as a line and including the position of the line, had to be drawn first, so as to establish and locate the position of the intersection. Some candidates only managed to satisfy this part of the question. A few of these did not even establish the true length on the triangular plate by drawing first a line parallel to the X-Y line and presenting the true length of this line on the other view. Markers noted that only a few candidates knew how to construct the second auxiliary view X2Y2, although projection lines were nearly always correctly projected from the first auxiliary view, normal to X2Y2. The solutions presented for the rest of the question were very disappointing and showed that the second auxiliary view method was not familiar with the candidates. Many candidates presented a series of irrelevant diagrams with the same repetitive mistake – that of transferring the incorrect distances from one view to the corresponding points on the next view.

Candidates' performance re-question 2.

	1 to 9 marks	10 to 19 marks	Full marks
Eng. Drg. & Gr. Comm.	3	10	-

Question 3. Intersection of solids

A diagram of an oblique cone and a right cylinder was shown in Figure 3a. Candidates had to copy Figure 3b showing the given plan, the incomplete front elevation and add an end elevation. The curve of intersection between the two solids, which is the curve common to both surfaces, had to be plotted on the three views. These curves were to be constructed neatly and shown on the three views leaving construction lines visible as an evidence of how intersecting points were obtained. Some of the candidates made it obvious that they first copied the two given views of Figure 3b and then read the question, without having a clue on how to solve it. This type of approach ends up with a particular type of method with a series of lines yielding no result. These lines had to be all erased and another type of method adopted for a different approach. This rendered the final solution untidy and often incomplete.

A significant number of solutions did not progress beyond the re-drawing of the given elevation and plan. Some candidates preferred to take horizontal cutting planes on the front and end elevation. Some failed to project the correct intersecting points from circular cutting planes on the plan down to the respective cutting planes on the elevations to locate the points of intersections. In some instances, where the intersection was obtained and the intersection shown, the hidden detail was missing or not complete.

The marks for the development of the oblique cone were not awarded to candidates who presented the development of a right cone.

Candidates' performance re-question 3.

	1 to 9 marks	10 to 19 marks	Full marks
Eng. Drg. & Gr. Comm.	5	8	-

Question 4. Disc cam with radial arm and roller follower

Candidates who attempted this question were expected to be knowledgeable about "cams" and therefore aware that there are types of (i) cams, (ii) followers and (iii) follower motions. A glance at the illustration Figure 4a, presented with the question, was enough to indicate and identify which category the cam in question was.

Most of the candidates found it convenient to use a displacement diagram in which the rise and fall of the follower was plotted against the angular displacement of the cam. Markers were pleased to note that the majority of the candidates managed to answer this part of the question and presented a satisfactory cam displacement graph.

Some of the candidates did not notice that a radial arm or oscillating follower was to be constructed in the second part of the question. Their solution was irrelevant since the method adopted was completely different from the one requested. The radial arm follower is pivoted at one end. The other end carries the roller and works on the cam profile. Only a few candidates presented the correct solution showing the method for constructing this type of cam profile.

Candidates' performance re-question 4.

	1 to 9 marks	10 to 19 marks	Full marks
Eng. Drg. & Gr. Comm.	2	6	2

Question 5. The Helix

The end of a special screw was shown pictorially in Figure 5a. This view showed clearly the screw with a single-start square right-hand thread on one end and a two-start left-hand square on the other end. Candidates were to copy the full-size elevation of the machined bar shown in Figure 5b and answer parts (a) and (b) of the question.

Part (a) A left-hand single-start square thread had to be constructed on this portion showing the construction of the helix and all the visible helices omitting hidden detail.

Part (b) On the same elevation but on the other end of the bar, the construction of a right-hand two-start square helical thread had to be constructed. The hidden detail was not to be shown so as to leave the elevation of the visible helices, drawn by a fair curve through the intersections, neat and clear.

Some candidates gave the impression that they were only familiar with the single-start thread. Some did not differentiate between the left-hand (rising towards the left) and the right-hand (rising towards the right) helix. Others presented a helical square spring. Only one candidate, managed to present a neat and correct solution of the right-hand two-start square helical thread. The technical terms pitch, lead and hand were often omitted on the drawing.

Candidates' performance re-question 5.

	1 to 9 marks	10 to 19 marks	Full marks
Eng. Drg. & Gr. Comm.	5	5	1

Question 6. Traces of planes

A pictorial view of a vertical and a horizontal plane were shown in Figure 6a. Enclosed between these planes, two solids were positioned showing a pentagonal right prism resting on its base and a right cylinder resting horizontally on its generators. A segment of the cylinder was sliced off to make it stable. An oblique plane partially hatched, inclined to both planes and passing through both solids was pictorially presented in this illustration. A glance at this pictorial view was enough for the candidate to establish the topic of this question and copying the given views shown in Figure 6b on the A2 drawing paper only was a waste of time.

The method of converting the oblique plane to an inclined plane neatly and accurately by constructing an auxiliary view showing the edge view of the oblique plane is of utmost importance. The rest of the question will be completely irrelevant and a waste of time if this method is not executed in the right and correct procedure.

The final part of the question was to determine and draw the sectional plan and elevation of the two given solids by normal projection lines.

Candidates' performance re-question 6.

	1 to 9 marks	10 to 19 marks	Full marks
Eng. Drg. & Gr. Comm.	3	2	-

PAPER 2

The number of candidates sitting for Advanced Level Engineering Drawing was only 1.

As the number of candidates is so small, no detailed discussion about performance can be given.

Chairperson

2018 Examination Panel