L-Università ta' Malta

MATSEC
Examinations Board

Examiners' Report

AM Graphical Communication

Special September Session 2020

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A. STATISTICAL INFORMATION

The total number of candidates who registered to sit for Graphical Communication was 29.

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

GRADE	A	B	C	D	E	F	ABS	TOTAL
No. of Candidates	-	5	7	6	3	7	1	29
% OF TOTAL	0.0	17.2	24.1	20.7	10.3	24.1	3.4	100

Table 1: Distribution of grades for Graphical Communication, Special September Session 2020

B. GENERAL REMARKS

As indicated in the above table, none of the candidates attained a grade 'A'. There were some candidates who presented good solutions in particular questions, however some of these candidates either did not manage to complete the whole paper or found difficulties in other questions. When marking Paper 1, it was noted that certain candidates seem to have forgotten the basic geometric constructions and projections, which were covered during their SEC level course. Examples of these are the polygons, the construction of a tubular helix and the projection of an orthographic view of an inclined circular face. In what regard Paper 2, markers noted that most candidates performed quite well in the perspective question but performance in the other three questions was inferior.

It is extremely important that candidates are aware of the requirements of the syllabus and practise continuously throughout the two-year course. The working out of past examination papers, and be familiar with questions set at this level, is also very important.

C. COMMENTS ON PAPER I AND PAPER II

PAPER I

The candidates were asked to attempt five questions from the six presented.

Question 1. Interpenetration (20 marks)

Candidates were given a front elevation, an incomplete plan and a pictorial illustration of an igloo-shaped doghouse consisting of a hemisphere with an offset pentagonal entrance. They were asked to complete the plan and project an end elevation. In both views, the candidates had to show the curves of intersection.

About 80% of the candidates attempted this question. The average mark was 10. One third of the candidates attained a very good mark. The others lost marks for the following reasons:

1. Several candidates drew section planes in the front elevation but failed to draw the corresponding circles to represent the sections in the plan. Apparently, only the first stage of the method was well remembered. This shortcoming resulted in incorrect intersection curves in both the plan and end elevation.
2. Incorrect methods to determine the curves of intersection were used. These methods included the division with the 30° / 60° setsquares of the hemisphere in the three views. The results were obviously erroneous.

3. Some candidates drew the 45° line facing the other way round. This led to a confusing end elevation.
4. Quite a few candidates did not complete the solution or stopped at the early stages of the solution.

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
10	8	1	10

Table 2: Candidates' performance in Question 1

Question 2. Helix / Superior Trochoid (20 marks)

A front elevation of a Solomonic candle holder was given. This ornament consisted of a base, which had a profile of semi superior trochoid, a cylindrical spacer, two helical tubes, and a decorative cast cylindrical top to hold the candle. The separate dimensioned items were given in another figure. The candidates were asked to construct the front elevation of the assembled candle holder.

More than three quarters of the candidates attempted this question. The average mark was 10. A quarter of the candidates who attempted this question managed to attain a very good mark. The other candidates were less successful due to the following shortcomings:

1. Quite a few candidates presented inadequate drawings of a helix.
2. Some other candidates constructed the helices correctly but only a few drew the Ø10 circles on the plotted points on the helices to create the two cylindrical helices. Most of these candidates just copied freehand the central helices to make the helices look cylindrical.
3. A few candidates used an incorrect diameter to construct the helices.
4. Others divided the pitch into eighteen equal parts while dividing the Ø40 circle into twelve equal parts.
5. Only a few candidates managed to complete the superior trochoid correctly. The main defects in their constructions were the incorrect measurements of the distance travelled by the rolling circle. In some cases, the circumference was calculated on the generating circle instead of the rolling circle. This resulted in a larger base.
6. Some candidates changed the direction of the directing line from horizontal to vertical.
7. Other candidates did not complete the trochoid, some stopped at the initial stages while some others did not manage to proceed much further.

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
5	13	-	11

Table 3: Candidates' performance in Question 2

Question 3. Dihedral angle / true shapes (20 marks)

Two right hexagonal pyramids were used and arranged to form the upper part of a bird feeder. An illustration of the complete bird feeder accompanied the question. Six ridge caps were required to assemble one of the hexagonal pyramids. Two orthographic views of one ridge cap were presented with the question.

It is a normal procedure in industry that, before a task is manufactured, preliminary drawings and estimates are done. A pattern drawing is worked out and complete drawings are presented to the sheet metal worker.

From the two given views, candidates were requested to determine the true shape of the ridge cap before bending. Not all candidates were aware that the question included an object with inclined faces of a complex nature. The best approach to solve the solution was to draw a first auxiliary view and project a second

auxiliary view projected from the first auxiliary view. Some candidates did not analyse the question thoroughly and set off by copying immediately the two given views. A few of these candidates attempted to find the true length of each side and stopped there. Others merely copied the two given views only.

Markers noted that a good number of the candidates took the correct approach and presented a satisfactory solution, by projecting a first auxiliary view and a second auxiliary view to solve and determine the dihedral angle of the bent sheet metal plates of the ridge cap. The dimensions from the original view were carefully transferred to the appropriate projectors above the datum lines (X-Y line). Full lines and hidden details were neatly presented. The reference numbers or letters were included, making it easily to follow the method adopted. Some candidates moved the X_1Y_1 line to a new position and included the words 'Shadow X_1Y_1 line'. The true shape of the ridge cap was presented by projecting another auxiliary view from the previous view, in a neat and clear manner.

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
7	8	-	14

Table 4: Candidates' performance in Question 3

Question 4. Transition piece development (20 marks)

An illustration and two orthographic views of a rectangle to round transition piece were given. The rectangular end of the transition piece was resting on the horizontal plane and the circular end was inclined at 30° to the horizontal. The candidates were asked to draw the given views, draw the crease lines, and construct their true lengths.

Most of the candidates attempted this question. The average mark was 8.5. None of the candidates managed to attain full marks. Their errors consisted mainly of the following:

1. Since the top circular part of the transition piece was inclined at 30° to the horizontal, the projection of the inclined circle to the plan had to be represented by an ellipse. Most candidates did not draw the ellipse but drew a circle instead. Others just drew a freehand ellipse.
2. Some candidates drew the creasing lines incorrectly.
3. Most of the candidates did not construct the true lengths correctly. Some remembered the initial stages of a particular method but could not complete the subsequent steps. Others did not realise that, since the top part of the transition piece was inclined, the vertical height had to vary according to the position of the crease lines. These candidates constructed the true lengths by using the maximum vertical height.
4. Because of the bad construction of the true lengths (which in some cases were far off the mark), most of the surface developments were incorrectly constructed. Only a few candidates came close to drawing it correctly.
5. Some other candidates did not even attempt to construct the surface development.

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
9	11	-	9

Table 5: Candidates' performance in Question 4

Question 5. Traces (20 marks)

An illustration of a trophy, resting on the horizontal plane and cut by means of an oblique plane, was given. Two orthographic views and the vertical and horizontal traces were also given. The trophy consisted of a square base with a chamfered top. The upper part of the trophy comprised an inverted octagonal right pyramid inserted in the centre of the square base. An oblique plane truncated the base and pyramid to give the trophy a unique and recognisable feature.

More than 80% of the candidates attempted this question. The average mark was 8. Marks were lost for the following reasons:

1. Most of the candidates did not construct a correct octagon in the plan.
2. Half of the candidates, who attempted this question, just copied the given orthographic views.
3. Some candidates managed to project the auxiliary view and converted the oblique plane into an inclined plane. However, when they tried to project lines from the cutting plane to the plan, they failed to locate the correct intersections to draw the truncated plan. This was because, when copying the plan, they did not draw the hidden edges of the inverted pyramid.
4. Only a few candidates attempted to project the true shapes of cut.

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
10	9	-	10

Table 6: Candidates' performance in Question 5

Question 6. Framework (20 marks)

A framework of a roof supported at both ends was illustrated below the question. The framework was made up of a number of simple triangular frames and loaded with three parallel forces supported by two reactions at its extremities.

Candidates were asked to reproduce the given space diagram using the scale specified and complete this diagram with Bow's notation. Markers noted that not all candidates used capital letters when using Bow's notation on the framework, some of which were carelessly and haphazardly written down. Some of the arrow heads were untidily drawn.

Most of the candidates succeeded in drawing the polar diagram, the link polygon, and the force diagram correctly. Parallel lines were transferred from the polar diagram and drawn in their correct spaces on the link polygon. On some solutions the 'closer line' was not transferred accurately on to the force diagram and the magnitude of the left and right reaction were incorrectly stated.

A good number of candidates did not attempt the last part of the question, stating which member of the framework was in tension or in compression. Some candidates stated that a member was a tie or a strut without showing how they arrived at this conclusion. Markers came across neat, tabulated results distinguishing between struts and ties, including vector diagrams for each junction of the framework. The magnitude of each member of the framework was also correctly stated in the table.

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
3	13	3	10

Table 7: Candidates' performance in Question 6

PAPER 2

The candidates were asked to attempt all the four questions presented.

Question 1. Two-point perspective drawing (34 marks)

Candidates were presented with four orthographic views of a BBQ area, from which they had to construct an estimated two-point perspective drawing. The average mark was 21.2 / 34.

The following shortcomings were noted during the marking process:

- Incorrect/incomplete/inaccurate construction of a two-point perspective grid. This resulted in either elongated or widely stretched drawings. Some other candidates respected the drawing scale given but failed to make wise use of the provided space. This resulted in small drawings when compared to the overall scale of the drawing sheet.
- Some grids did not observe the rules of perspective, failing to decrease in size as they receded from the viewer.
- Construction work that was not neat, due to dark unsharpened pencils being used.
- Rendering that was not up to standard.
- The room ceiling not protruding on all sides of the utility room.
- Drawing of a one-point perspective or simply scattering the items around the grid at will and not as indicated.

1 to 15 Marks	16 to 33 Marks	Full Marks	Not Attempted
5	17	-	7

Table 8: Candidates' performance in Question 1

Question 2. Freehand sketching (22 marks)

Four orthographic views of a food blender were given. Candidates had to use the information supplied in these orthographic views to draw a well-proportioned Isometric view of the blender. Candidates also needed to render the listed materials in colour, label the different parts of the blender, and indicate both movement of parts and operation of the blender with arrows.

The average mark of this question was 13.2 / 22.

The following shortcomings were noted during the marking process:

- In many cases, drawing crates were not used, hindering the process of keeping the right proportions between different parts of the blender.
- Lack of firm use of freehand drawing, with noticeable lines not parallel where required.
- Missing annotations of the separate parts of the blender as requested or missing arrows to indicate movement of parts and the operation of the blender.
- Lack of proper rendering of the material, resorting to haphazard and careless use of colour.

1 to 10 Marks	11 to 21 Marks	Full Marks	Not Attempted
3	19	-	7

Table 9: Candidates' performance in Question 2

Question 3. Infographic Chart (22 marks)

Statistical information was provided to indicate the lending activity in a secondary school library. Candidates had to turn these statistics into graphical information using graphs/charts and suitable pictograms. Candidates were also required to use suitable typefaces for statements and display thinking progression using preparatory sketches.

The average mark of this question was 13.9 / 22.

The following shortcomings were noted during the marking process:

- Very few candidates used proper typefaces and only resorted to normal writing for statements and titles.
- Very few candidates used the provided space effectively, resorting to a poorly congested infographic.
- Pictograms for Part B of the question were many times left out or simply ignored, resorting to simple bar graphs only to represent information.
- Preparatory sketches were in many cases left to a minimum, or else haphazardly executed, showing no progression of thought, or failing to convey proper messages.
- Writing wrong statements such as 'benefits of knowledge' instead of 'benefits of reading'.
- Very few answers showed decent use of colour and shading.

1 to 10 Marks	11 to 21 Marks	Full Marks	Not Attempted
6	16	-	7

Table 10: Candidates' performance in Question 3

Question 4. Shop Sign (22 marks)

Candidates were required to come up with an appropriate shop sign for a Barber shop offering services ranging from haircuts to beard shaving and grooming.

The average mark of this question was 11.8 / 22.

The following shortcomings were noted during the marking process:

- Many candidates focused only on the shop's title, rendering only a type-faced sign devoid of any graphical symbols or pictograms.
- The majority of sketches were rough, failing to show any development of thought or ideas.
- Some candidates did not do any sketches at all and started drawing directly on the presentation space.
- Use of colour was sparse and in the majority of cases was carelessly executed.

1 to 10 Marks	11 to 21 Marks	Full Marks	Not Attempted
5	17	-	7

Table 11: Candidates' performance in Question 4

Chairperson
Examination Panel 2020