Examiners' Report

AM Graphical Communication

Main Session 2022

Examiners' Report (2022): AM Graphical Communication

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A.   STATISTICAL INFORMATION

The total number of candidates who registered to sit for Graphical Communication was 41.

Table 1 shows the distribution of grades for the Main 2022 session of the examination.

GRADE	A	B	C	D	E	F	ABS	TOTAL
No. of Candidates	4	6	8	9	3	11	0	41
% OF TOTAL	9.8	14.6	19.5	22.0	7.3	26.8	0.0	100.0

Table 1: Distribution of grades for Graphical Communication 2022 Main Session

B.   GENERAL REMARKS

A quarter of the candidates were well-prepared for the exam. These attained above 64 marks in Paper 1. Another quarter attained between 50 – 64 marks. Half of the candidates attained less than 50 marks. About a fifth of the candidates attained less than 25 marks The average mark was 46%.

The candidates fared better in Paper 2 attaining an average of 61%.

The average mark of the CAD portfolio was 84%.

The examiners have noted, with concern, the mark difference between Paper 1, Paper 2, and the CAD component.

C. COMMENTS ON PAPER 1

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

Question 1: Traces of planes (20 marks)

The candidates were given an illustration and two orthographic views of a right cone cut by an oblique plane VTH. They were asked to copy the orthographic views and project an auxiliary view to determine the true angle of the incline plane. The candidates were also asked to project the truncated plan, the truncated front elevation, and the true shape of cut. Finally, they were asked to locate the focal sphere in the truncated cone, determine the position of the focal point, the vertex, the directrix, the ratio of eccentricity and the name of the conic section.

Although nearly three quarters of the candidates attempted this question, none of them managed to attain full marks. The average mark was 7/20. Marks were lost for the following reasons.

a)   About a third of the candidates just copied the given views attaining only one mark.

b)   Other candidates attempted to project an auxiliary view to determine the true angle of the inclined plane but in some way or another got mixed up along the way.

c)   Some other candidates managed to successfully complete the projections of the inclined plane, the plan, the front elevation, and the true shape of cut, but did not proceed to locate the focal sphere and consequently find the positions of the focal point, vertex and the directrix.

d)   Others invented the positions of the focal point and the directrix without constructing the focal sphere.

e)   Some candidates tried to construct the focal sphere on the wrong side of the truncated cone.

f)   A few candidates, who correctly completed most of the question, erroneously deduced that the conic section was a hyperbola instead of a parabola. A slight inaccuracy could have led to such an assumption. However, the clever candidates should have known that the conic section was a parabola before constructing the focal spheres. This is because the inclined plane found in the auxiliary view was parallel to the slope of the cone.

Candidates' performance in question 1

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
15	12	0	14

Question 2. Isometric drawing (20 marks)

Three orthographic views of a mechanical component, machined from an octagonal prism, were given. The candidates were asked to draw a small pictorial freehand preparatory sketch of the component. They were also asked to draw a full-size isometric view of the item.

Around eighty percent of the candidates attempted this question. One candidate attained full marks and the average mark was 9/20. Some other candidates presented good solutions, however, others presented solutions which left much to be desired. The following were the main shortcomings.

a)   Some candidates did not copy the given orthographic views correctly. The main hurdle was constructing the regular octagonal plan. It is suggested that the topic about construction of regular polygonsis revised.

b)   Others just copied the orthographic views and did not proceed any further.

c) Other candidates did not manage to visualise correctly the orthographic views. This was evident by the pictorial freehand sketches and isometric drawings presented. Some "stuck" the given views on the isometric crate but could not "sculpture" the form deeper than the surface of the crate.

d) Some isometric circles were drawn freehand without any constructions.

e) Some candidates seemed to have misunderstood the question and attempted to present an auxiliary view of the component.

Candidates' performance in question 2

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
22	10	1	8

Question 3. Loci of mechanisms (20 marks)

A line diagram of a mechanism was given. The candidates were asked to copy the diagram, plot the loci of pin joints C and D, determine the positions of slider Q and its stroke length. Finally, they were asked to draw the displacement diagram of slider Q.

Around a third of the candidates attempted this questions, two attained full marks, others attained a decent mark, while others just copied the given line drawing but did not proceed much further. The average mark was 10/20. The following is a list of common errors noted.

a) Some candidates could not visualise the movements of the linkages, cranks, and slider. This was evident from the solutions presented. Candidates are encouraged to develop their methods of visualising linkages even if this entails using pencils and other items in the pencil case to animate the mechanism.

b) Other candidates lost marks due to lack of accuracy.

c) Some other candidates did not draw the slider displacement diagram.

Candidates' performance in question 3

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
8	3	2	28

Question 4. Archimedean spirals /common tangent (20 marks)

An illustration and a dimensioned drawing of an 'S' scroll was given. The scroll consisted of two Archimedean spirals connected by a common tangent. The candidates were asked to construct the scroll. About half of the candidates attempted this question. The average mark was 9/20 and the highest mark attained was 14/20. Candidates lost marks for the following reasons.

a) Some candidates just copied the given starting lines and did not progress any further.

b) Others did not copy the given starting lines correctly.

c) A few candidates drew the spirals freehand.

d) Certain candidates got confused when constructing the requested 11/12ths of a convolution of the Archimedean spiral.

e) None of the candidates calculated and constructed the common tangent, connecting the two spirals, correctly.

Candidates' performance in question 4

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
10	11	0	20

Question 5. Truncated oblique cone surface development (20 marks)

The candidates were given an illustration and a front elevation of a custom shaped funnel which had the form of a truncated oblique cone. They were asked to copy the given front elevation, find the true lengths of the generators, and construct the surface development of the funnel.

Nearly half of the candidates attempted this question. The average mark was 12/20. Quite a few candidates managed to attain nearly full marks in this question. Others lost marks for the following reasons.

a) Some candidates copied the given front elevation and did not advance any further.

b) Others copied the given drawing incorrectly.

c) A few candidates attempted to proceed with the solution but appeared to have a very vague and confused idea how to find the true lengths.

d) Others tried to find the true lengths without drawing, at least, a part plan.

e) On the other hand, there were candidates who projected a complete truncated plan (which was not requested).

f) Some candidates did not complete the two truncations of the cone.

g) Other candidates used confusing and unclear methods to find the true lengths of the generators. While it is acknowledged that there are different methods of finding the true lengths, the candidates are encouraged to use the most clear and organised approaches. This will benefit both the candidates and the markers.

h) A few candidates who completed the surface development drew folding lines on each generator. It would have been more appropriate to leave the generators as constructions as, in the case of a cone (which has no edges) the generators are not folded.

Candidates' performance in question 5

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
6	12	0	23

Question 6. Interpenetration / surface developments (20 marks)

An illustration of a semi-pentagonal gutter, intersected by a cylindrical drainpipe, was given. Two orthographic views of the arrangement were also given. The candidates were asked to copy the given views, plot, and draw the curve of intersection, and project/construct the surface developments of the gutter and the drainpipe.

Slightly more than half of the candidates attempted this question. One candidate attained full marks and the average mark was 6/20. The following are the main errors that led to the loss of marks.

a) More than half of the candidates who attempted this question did not copy the given figure correctly. These either found difficulty to construct the semi-pentagon in the plan or to construct the elliptical

top of the truncated inclined cylinder. Most of these candidates did not progress any further than this initial stage.

b)   Some candidates did not determine the correct circumference to construct the surface development of the drainpipe.

c)   Other candidates did not draw the folding lines in the development of the semi-pentagonal gutter.

Candidates' performance in question 6

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
18	4	1	18

Question 7. Skew lines in space / shortest distance (20 marks)

A front elevation and a plan of two skew lines were given. The candidates were asked to find the true length of one of the lines. They were also asked to determine and state the shortest distance between the two lines. Finally, they were asked to project the position of the shortest connector in all views. Various auxiliary views were required to work out the solution.

Three quarters of the candidates attempted this question some of whom presented very good solutions. The average mark was 11/20. The following is a list of shortcomings noted by the markers.

a)   About a third of the candidates just copied the given views and did not proceed much further.

b)   Another third managed to project a first auxiliary view of one line and successfully found its true length. However, these did not proceed to project a second auxiliary view to get a point view of the found true length.

c)   Some candidates did not use the correct angles or used inaccurate angles when projecting the auxiliary views.

d)   Others selected inaccurate or incorrect measurements when projecting the auxiliary views.

e)   The last third of the candidates presented very good solutions attaining either full marks or nearly full marks, marks being lost due to slight inaccuracies.

Candidates' performance in question 7

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
9	18	2	12

Question 8. Cantilever loaded with uniformly distributed and concentrated loads (20 marks)

A space diagram of a cantilever carrying two concentrated loads and a uniformly distributed load was given. The candidates were asked to copy the space diagram, construct the bending moment diagram, draw the shear force diagram, and finally calculate and state the magnitude of the greatest bending moment.

Nearly three quarters of the candidates attempted this question. No candidate attained full marks, however, quite a few candidates attained very good marks in this question. The average mark was 14/20. Marks were lost for the following reasons.

a)   The space diagram and the polar diagram were not drawn with the requested scale.

b)   The uniformly distributed load (udl) was not broken up into a series of point loads.

c) More than half of the candidates treated the cantilever as a beam supported at the ends. In these cases, the closer was erroneously drawn spanning across the whole beam. In the case of a cantilever, the closer is to be vertical directly below the fixed support.

d) Some candidates did not calculate the bending moment scale and hence could not determine the magnitude of the greatest bending moment.

Candidates' performance in question 8

1 to 9 Marks	10 to 19 Marks	Full Marks	Not Attempted
3	24	0	14

D. COMMENTS ON PAPER 2

The candidates were asked to attempt four out of five questions presented.

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

This question dealt with a one-point perspective drawing of a theatrical stage. Four orthographic views of this stage were given. Candidates had to use this information to construct the one-point estimated perspective drawing of the entire stage. Overall, candidates did well in this question. The average mark was 25 / 34. However, certain shortcomings were observed in the marking process.

These were the following:
a) some candidates did not make efficient use of the entire side of the paper, resulting in drawings which were too small, comparatively;
b) some areas of the drawing, particularly the ceiling, were partly/completely left out;
c) a few candidates found the omega-shaped steps quite challenging to construct in perspective;
d) a number of candidates failed to represent the top part of the columns properly in perspective;
e) candidates failing to properly and neatly rendering in colour the various listed materials.

Candidates' performance in question 1

1 to 15 Marks	16 to 30 Marks	31 to 34 Marks	Not Attempted
2	30	8	1

Question 2. Infographic chart (22 marks)

This question dealt with the creation of an infographic chart with the use of text, graphs, and symbols to represent passenger and vehicle traffic between Malta and Gozo from 2019 to 2021. This was the least preferred question with candidates (40%) and the one that garnered the least marks (average 10 / 22).

Marks were lost due to:
a) lack of proper planning or very poor generation of ideas to properly convey the graphical information given;

b) lack of properly and neatly executed typefaces;
c) total lack of representation symbols;
d) careless or very poor execution of colour application;
e) drawing graphs/charts from which data is difficult or impossible to be read.

Candidates' performance in question 2

1 to 10 Marks	11 to 21 Marks	Full Marks	Not Attempted
8	8	0	25

Question 3. Logo design process (22 marks)

This question dealt with the creation of a new design to be placed on the side of land vehicles for a company by the name of 'Arrow Freight International'. The majority of candidates (75%) opted for this question, with quite a few good representations. The average mark was 14.5 / 22. However, marks were lost due to:
 a) written analysis / graphical analysis / design synthesis being completely left out;
 b) written analysis / graphical analysis / design synthesis executed only as a praxis rather than to help foment and crystallize ideas for an effective design;
 c) poor pencil drawing of ideas;
 d) poor use of colour application and colour choice;
 e) lack of original and captivating typefaces;
 f) lack of adequate drawings that mirror the company's business nature.

Candidates' performance in question 3

1 to 10 Marks	11 to 21 Marks	Full Marks	Not Attempted
4	27	0	10

Question 4. Pictorial freehand sketching (22 marks)

This question dealt with the pictorial representation of a DSLR camera. Six orthographic views were given, on which candidates had to base their pictorial drawing. Most candidates (78%) attempted this question, with answers ranging variably in technical and artistic quality. The average mark was 11 / 22.

Marks were lost mainly due to:
 a) lack of right proportion/scale in general and/or between the discrete items composing the object;
 b) lines of the pictorial drawing not being properly aligned or parallel to each other;
 c) lack of ability in drawing cylinders in 3D (lens/buttons);
 d) haphazard colour application;
 e) lack of knowledge in defining coloured textures;
 f) some candidates failing to use colour, presenting only line drawings;
 g) items presented in 2D rather than in 3D.

Candidates' performance in question 4

1 to 10 Marks	11 to 21 Marks	Full Marks	Not Attempted
11	21	0	9

Question 5. Shaded two-dimensional freehand sketch (22 marks)

This question dealt with drawing two orthographic freehand sketches of a water dispenser. Most candidates (90%) attempted this question with some delivering very good results. The average mark was 15 / 22. However, marks were lost due to:

 a) freehand lines not being parallel or aligned properly;
 b) haphazard execution of colour;
 c) lack of proper knowledge in representing textured materials;
 d) lack of proper scale/proportion of the discrete items composing the object;
 e) parts of items left out due to inadequate planning (lack of use of freehand crate);
 f) failing to use colour at all.

Candidates' performance in question 5

1 to 10 Marks	11 to 21 Marks	Full Marks	Not Attempted
7	30	0	4

Concluding Comment – Paper 2

- Most candidates did relatively well in the perspective drawing Question 1. Nearly all the candidates were able to correctly construct the perspective grid. Improvements are still required in the neatness and rendering.

- Question 2, which dealt with the graphical representation of data, was the least popular and earned the least number of marks. Candidates need to improve their idea generation skills by improving their 'thinking with their pencil' techniques.

- Questions 4 and 5 dealt mainly with freehand sketching, both 2D and 3D. Candidates still need to work harder to improve their freehand sketching and rendering skills. Continuous practice, to develop their manual dexterity, is recommended.

- Question 3 dealt with logo design. Apart from the few well-presented solutions, it was evident from the responses, that the candidates lack the knowledge of the main rules of this topic. A good logo needs to be simple, memorable, relevant, and original. It is suggested that the tutors encourage their candidates to research the history and the continuous developments of the logo design process.

Chairperson
Examiners Panel 2022