

GEOMETRICAL AND MECHANICAL DRAWING

| |
|-----------------------------------------------------------------|
| <p>Paper 7040/01 Plane and Solid Geometry</p> |
|-----------------------------------------------------------------|

General Comments

The general standard of the candidates was better this year, and the majority of the candidates had a good general understanding of the syllabus.

The general standard of draughtsmanship was very good. There were fewer rubric errors than in the past. The size of the drawing paper varied a great deal.

Question 1

This was a popular question on the paper. The majority of candidates were able to construct the ellipse for the lower part of the component, and determine the centres of the various blend radii.

Only a few candidates were able to construct the tangent to a point on an ellipse.

Question 2

Another popular question. The majority of the candidates could visualise the mechanism and, consequently, this question had the best solutions to any question on the whole examination paper.

This part of the syllabus had been well taught in most Centres.

Question 3

Most candidates were able to construct the lower half of the polygon correctly, but were unable to construct the 90° angle in the correct position, (i.e. by using the theory that angles subtended at the circumference of a semicircle are 90°) The construction of a similar figure was well answered.

Question 4

Isometric view.

This question was not as popular as in the past, but the majority of the candidates who attempted it, produced good accurate solutions.

Question 5

Most of the candidates failed to construct the octagon in the front elevation; consequently the other views were incorrect. Many candidates did not attempt the development for the octagon.

Question 6

This question had a multitude of different solutions from the candidates. Unfortunately the majority were incorrect.

Most candidates knew the construction for a helix, but the answers varied from a single line helix to a square thread on a shaft.

Where the correct points for the outline of the spring had been plotted, the candidates found difficulty in joining the correct points to give the correct shape of the 15 mm square spring.

Question 7

This was a popular question.

Most Centres had obviously dealt with the intersection of two circular pipes and most candidates produced excellent solutions to this question.

Question 8

This was a popular question, presenting a typical standard conic problem, with various methods of determining the various curves. The majority of the answers were correctly drawn.

Some candidates were unable to correctly project the plotted points from one view to the other views, which is necessary to obtain the required curves.

GEOMETRICAL AND MECHANICAL DRAWING

Paper 7040/02
Drawing (Mechanical)

General Comments

Regrettably this was the last occasion on which this G.C.E. subject will be offered as an examination subject by the Examination Syndicate. However the quality of the scripts were very similar to those of recent years with some excellent solutions presented by the more able candidates.

Centres should ensure that they supply the specified A2 size paper. This enables their candidates to present solutions that reflect their comprehension and draughting ability.

Section 1

Question 1

For a question that states very clearly that a freehand solution is required it was very disappointing to note that many candidates used some mechanical aids with others presenting an isometric projection drawn completely with instruments. Obviously, such practices were penalised with loss of marks. Never the less, there were many creditable unaided freehand solutions.

The majority of candidates correctly interpreted the two given orthographic views into a pictorial form. However, some common errors included:

omission of the 5 mm x 7 mm step, or the inclusion of a second at the opposite end, when not required,

the stirrup drawn the same width as the sole plate, when in fact, it was 40 mm wider and/or the stirrup was drawn as a solid block rather than a 5 mm thick strap,

the proportions of the various elements were drawn considerably out of scale.

Generally, the straight lines and square corners were tackled successfully by the majority of candidates. However, the curves caused more problems, largely due to many candidates failing to 'box in' prior to drawing the necessary elliptical curves.

Except in a handful of cases the line quality of the solutions was of a satisfactory/pleasing standard.

Section 2

Question 2

There were a relatively large number of end views drawn when looking in a different direction to the given arrow and there were also incorrect assemblies seen. It would appear that many candidates had not used the 10 minutes reading time effectively, preferring to start drawing before organising their thoughts and understanding the requirements of the question.

Whilst virtually all candidates had projected their views correctly, the projection symbol, in many cases, did not agree with their solution. Although not necessary, a large number of candidates had attempted a plan view, unfortunately these plans scored no marks. Since the majority of these candidates then failed to complete the two requested views they consequently lost marks by default.

(a) There were a number of common assembly errors:

The shoulder of the bush (4) was not in contact with face F of the bearing and was consequently inserted the wrong way, so that the view became 'handed' i.e. the spindle (5), spacer collars (11), diamond wheel (3), plain washer (9) and M14 nut (10) were drawn on the left instead of the right hand side of the body (1).

The 40 mm diameter x 1 mm deep recess of the two spacer collars (11) were not facing the flat faces of the diamond wheel (3)

The keyway of the pulley (6) and that of the spindle (5) were out of alignment.

A surprisingly high number of solutions showed the grub screws (8) inserted upside down in their holes. That is with the screwdriver slot in contact with the key (7) or surface of the spindle (5) instead of being visible so that a screwdriver could be used to loosen or tighten them during assembly.

The table (2) which should have rested horizontally on top of the body (1) held in place by the pivot pin (12) was often omitted, or drawn vertically, and occasionally on its own separate from the rest of the assembly.

A number of candidates failed to section this view and lost marks by wrongly sectioning their end view instead.

It is pleasing to note that there were a number of excellent answers to this section of the examination paper.

(b) Although attempted by the majority of candidates many lost marks in drawing this view because they:

sectioned the view,

included hidden detail viewed from the wrong side of the body (1),

omitted the diamond wheel (3) and/or table (2).

(c) Relatively few candidates were able to insert examples of the five requested dimensions correctly. This is an aspect of the syllabus that requires more attention.

(d) The expected title was Hobbyists Gem Stone Saw not machine drawing or G.C.E. Approximately 50% of the candidates failed to include the scale used which should have been ideally expressed as a ratio e.g. Scale 1:1. Whilst most candidates worked from a central line, few used a chain line of the correct form.