

GEOMETRICAL AND MECHANICAL DRAWING

Paper 7040/01

Plane and Solid Geometry

General comments

The standard of answers was very similar to that in the past years. Many candidates failed to read the instructions correctly and answered 4 questions in **Section 2**. Some Centres are allowing candidates to use more than one sheet of drawing paper for their answers. Other Centres are sending the scrips rolled up instead of flat or folded.

Comments on specific questions

Section A. Plane Geometry

Question 1

This was by far the most popular question, and generally well answered by the majority of the candidates. Some candidates drew an escribed pentagon instead of the required inscribed pentagon. The construction of a square equal in area to the pentagon was very well answered, and had been well taught by the various Centres.

Question 2.

Unfortunately although this was a popular question, many candidates were unable to construct the involute to the 50 diameter circle. Very few candidates were able to construct the tangent to the involute correctly and it would appear that some Centres have not covered this area of the syllabus.

Question 3

This question was well answered by a few candidates, but other candidates drew cycloids, or epicycloids, instead of the required hypocycloid. The complexity of their construction often led to the incorrect plotting of the curve.

Section 2 Solid Geometry

Question 4.

Another popular question, but many candidates found difficulty in interpreting the end elevation. The auxiliary view was often drawn as an isometric view.

Question 5

Those candidates that attempted this question generally interpreted the shape correctly. There were very few freehand sketches of the bracket.

Question 6

For some reason the candidates were unable to draw the given views correctly. The 55 mm square was drawn as an irregular diamond, and circles of several diameters, consequently the curves of intersection varied according to the candidates solution. It was apparent that the candidates were able to draw the intersection of a cylinder and a round pipe, but were unable to visualise a cylinder intersected by a square duct.

Question 7

This question was attempted by very few candidates. The candidates appeared to have difficulty in visualising a line in space between the x and y-axis. Some candidates were able to find the true length of the line, but very few could determine the true angle of the line to the horizontal and vertical planes.

Question 8

A standard popular question with the majority of candidates having a reasonable idea of the correct solution. Some candidates were unable to complete the question due to the complexity of their own solution.

GEOMETRICAL AND MECHANICAL DRAWING

Paper 7040/02
Drawing (Mechanical)

General comments

The number of Centres providing candidates with A2 size, good quality drawing paper increases every year. Unfortunately a small number of Centres continue to issue thin lining paper that is not considered suitable for this examination. In addition, rather more problematical for candidates is where A3 size sheets are provided since solutions cannot be accommodated. Centres are advised that for **Question 2** unless views are in projection candidates will be penalised. Obviously views on the reverse side of a sheet or on another are not considered by Examiners to be in projection.

Several Centres had rolled up the scripts before placing in the plastic envelope. Unfortunately these always arrive badly creased and bent. A centre fold with the sheets placed flat in the dispatch envelope is far better with the scripts arriving for marking in mint condition.

Section 1

Question 1

Whilst it is perfectly acceptable that the solution to this question is based upon the isometric projection principle, the use of instruments is not. This question is intended to test a candidate's freehand ability. Those candidates, who have been warned then still persist in using 'aids' at any stage, must expect to be penalised, since such practices are readily detected by examiners. Although mentioned in several recent reports, regrettably, a number of candidates are still using instruments of various kinds and consequently losing marks. However it was also pleasing to note that there were many excellent freehand sketches that scored highly.

The majority of candidates were able to interpret the orthographic views correctly, although many of the weaker candidates omitted the two semicircular ended slots in the base and/or the lug. Rather surprisingly the greatest misunderstanding was in respect of the truncated conical column that was frequently incorrectly drawn as a square pyramid.

To score well with this type of question, candidates need to be aware that the examiners are looking for:

- a correct translation from orthographic to pictorial form;
- a sketch that is approximately full size;
- well proportioned details;
- good line quality representing parallel/straight lines arcs and circles.

Section 2

Question 2

There were few problems with the correct assembly of the various components of the Tile Cutter; possibly the schematic outline had helped. Whilst there were a small number of candidates using a mixture of 1st and 3rd angle projection, incurring a small penalty, there were rather more candidates who made no attempt to project views preferring to place them at random anywhere on their paper. In such cases only the best view scores. In this paper candidates must be taught to follow the correct layout for orthographic projection as outlined in BS308/PD7308: any deviation will be penalised.

It is surprising how many candidates insist on including hidden detail on their views although told this is not required. Whilst this practice does not result in any direct loss of marks, in many cases the time spent on this unnecessary feature means that other views cannot be completed within the allocated time.

- (i) Most candidates presented correctly a complete sectional elevation, but there were a handful of outline views. Other common errors were:
- failure to place Plain Washer (11) under head of Slider Bolt (10);
 - position of Arm (6) and Handle (7) in Cutter Block (3);
 - omit scoring Disc (4) from Cutter Block (3) assembly;
 - no Adjustable Guide (12);
 - tile not inserted or incorrectly positioned in Body (1).
- (ii) Generally projected correctly from sectioned elevation. However there were a number of scripts where a single central Slider Bolt (10) had been drawn instead of two at 50 mm between centres for supporting the Carriage (2). A large number of candidates positioned the Tile (13) and consequently the Adjustable Guide (12) incorrectly.
- (iii) A number of solutions had the end view drawn on the wrong side of the sectional elevation (i). Very few solutions showed the Tile (13) in this elevation even where candidates had shown it in position in (i) and (ii). A large number also failed to include the Feet (5).
- (iv) Dimensioning continues to be an aspect that requires more attention. Far too many candidates do not follow the guidelines laid down in BS308/PD7308. Notably dimension arrows should be continuous and not broken. The measurement should be above and not touching the arrow. Leader lines from arrows to view should have a small gap and not touch the component being sized.
- (v) The title should have been Tile Cutter not Machine or Assembly Drawing as stated on several scripts. Scale should have been presented as a ratio 1:1 or a statement 'full size'. Large numbers of candidates omitted the projection symbol with a handful writing 1st/3rd angle projection when a symbol is preferred, and asked for in the rubric.