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## FOREWORD

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This booklet contains reports written by Examiners on the work of candidates in certain papers. **Its contents are primarily for the information of the subject teachers concerned.**

# GEOMETRICAL AND MECHANICAL DRAWING

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## GCE Ordinary Level

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| <p>Paper 7040/01<br/>Plane and Solid Geometry</p> |
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### General comments

This year the quality and ability of the candidates varied enormously between the Centres.

Some Centres had very good drawing facilities, whilst other Centres were seriously handicap by the lack of suitable equipment.

### Comments on specific questions

#### *Section 1*

#### **Question 1**

Popular question and well answered by the majority of the candidates. Some of the common mistakes were:

- the semi ellipse was not constructed, but drawn using templates
- the equidistant curve to the semi ellipse was not constructed
- the tangent was not constructed to the ellipse
- the tangent was not constructed from the point to the 20 radius.

#### **Question 2**

This loci question was very popular, and was very well answered. The theory of loci appeared to have been well taught in the Centres.

#### **Question 3**

The common mistakes in this question were:

- the 105 and the 97.5 degree angles were not constructed. The angles should have been constructed by bisececting, and sub bisecting 30-degree angle
- the construction of the right angle in the top corner of the figure should have been constructed within a semi circle
- the construction of a square equal in area to the figure was very well answered
- some candidates calculated the area of the square. The questions clearly stated construct a square etc.

## **Section 2**

### **Question 4**

Some Centres had very little knowledge of how to construct the conic sections.

The true shape was not drawn perpendicular to the required cut face, but at an oblique angle.

### **Question 5**

This question was basically an orthographic view and development of a cut cylinder. Many candidates did not appreciate the simplicity of this question and did not draw the elliptical curves in the end elevation. Many candidates did not attempt the construction of the development of the cylinder.

### **Question 6**

This isometric question was not as popular as in the past, but very well answered. The only common mistake was not to draw the orthographic view of the dovetail, which would enable the candidate to draw the correct shape of the dovetail in the isometric view.

### **Question 7**

This type of question to determine the true lengths of lines or edges of a plate was not well answered. The majority of candidates had difficulty in visualising a line that is not parallel or perpendicular to the VP or HP plan. This year's answers were no different to those in the recent years, some candidates could not draw the given views.

### **Question 8**

Not a popular question. Many candidates could not understand the requirements of the question and constructed the helix for a cylindrical helix. Some candidates drew the helix on to the surface of the cone, but did not appreciate the question asked for one and a half turns of the helix, not just one complete helix on the surface of the cone.

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| <p><b>Paper 7040/02</b><br/><b>Drawing (Mechanical)</b></p> |
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### **General comments**

There continues to be large differences in both quality and quantity of the work submitted by candidates for this examination. Whilst the better candidates produced work of a very pleasing standard, a number of the weaker ones simply copied parts of the examination paper or presented a few rather untidy, unrelated lines.

Regrettably several Centres continue to disadvantage their candidates by failing to provide suitable paper. Sheets of A3 and A4 drawing paper are simply inadequate for the size of answers required, since the questions have been devised around a standard A2 sheet size. Centres are earnestly requested to ensure that no candidate is unfairly penalised by ensuring sheets of A2 drawing paper are available for this examination.

Examiners would be grateful if Centres where candidates use draughting or sticky tape for the temporary fixing of paper to the drawing boards if Invigilators could make sure it was removed before despatching the scripts.

**Comments on specific questions****Section 1****Question 1**

Although the majority of candidates were able to correctly translate the given orthographic drawing Fig. 1 into a realistic pictorial sketch, a number however, connected the horizontal barrel to the base continuously over its length not having realised there were two 10 mm thick vertical webs. Other candidates drew a solid barrel failing to realise that it was tubular and several failed to include the 10 mm x 10 mm notch.

Whilst the majority of solutions were approximately full-size in length many of the details were badly proportioned.

What a pity that candidates from many Centres continue to ignore the rubric concerning the use of instruments. Far too many candidates lose marks by measuring and in many cases drawing using set squares and straight edges. This question is intended to test the *freehand sketching* ability of candidates.

Centres are reminded therefore, once again, that candidates resorting to any mechanical aids other than pencil and rubber are penalised. Candidates should be told when being prepared for this question that a poor freehand sketch gains more marks for sketching ability than a perfect instrument drawing.

**Section 11****Question 2**

It was pleasing to note that the majority of candidates had assembled the principal components correctly, suitably positioned on their paper. Line quality and accuracy were also generally of an acceptable standard. A number of the lower scoring candidates had a correct assembly but failed to complete sufficient views. Candidates prepared for this examination do need to be aware of the time restraint and work steadily throughout the examination if they wish to complete the paper.

(a) Generally assembled correctly but the main errors were:

- drawing a complete elevation or section when the question specified the left hand side to be an outside view and that to the right a section
- no Bushes (3) or in several cases assembled incorrectly
- failure to include the extra length of threaded hole in Faceplate (4) beyond the threaded end of Spindle (2) to which it was screwed
- No 4 mm diameter oil hole or 34 mm diameter relief recess in Body (10)
- the flat face and/or chamfers of Support Bar (6) were omitted
- that many candidates had failed to determine the distance across flats, preferring to simply guess the size when drawing the outline of the standard hexagonal M 14 Nut (10).

(b) A number of solutions were drawn when looking in the opposite direction to arrow E, not as requested. Several candidates positioned the Square Headed Bolt (8) on the right hand side of the view when in fact it should have been drawn on the left.

There were also several sectional views rather than the outside view required.

(c) Examiners are always surprised at the large number of incorrectly dimensioned scripts, particularly when a candidate has simply to copy the form of those on the examination paper. Centres should advise their candidates that only *one* dimension of each specified type is required for this examination question. There are no additional marks if extra dimensions are included and the time would be more profitably spent checking or completing the drawing.

(d) It was disappointing that many candidates forgot to include a title, scale or projection symbol and therefore lost marks. The expected title was Model Makers' Disc Sander not orthographic drawing or GCE O Level drawing as suggested by some candidates. Additionally the scale should be indicated as a ratio 1:1 or preferred a statement Full-Size.

Whilst the vast majority of candidates work from centre lines relatively few use chain lines of repeating short and long dashes that ideally should be lighter than the outline of the views.

The indication of a sectional surface is another aspect that is frequently poorly executed by candidates. Hatching lines should be at  $45^\circ$  with adjacent pieces sloping in the opposite direction. For small components the spacing is closer and again lighter than the lines used for the outlines of the views.

Finally, candidates frequently overlook the labelling and indication of cutting planes for a sectional view.