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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 Advanced Level and GCE Advanced Subsidiary Level

<p>Paper 9351/01 Applied Geometry</p>
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### General comments

Relatively few candidates took this examination.

The standard of work submitted was largely the same as in November 2002. Most candidates attempted the correct combination of questions and it was pleasing to note the high standard of presentation of answers.

### Comments on specific questions

#### **Section I**

#### *Compulsory questions*

#### **Question 1**

- (a) Most candidates drew the triangular plate with the base the correct length.
- (b) As a result of not reading the question carefully enough, a number of candidates presented an otherwise accurate solution with the points AB incorrectly positioned. In addition, some solutions did not include the triangular hole.
- (c) Almost all candidates correctly identified the helix.

#### **Question 2**

This question was answered very badly. Most candidates gained the one mark available for drawing the given views.

#### **Question 3**

- (a) The most common error in this question was a failure to reduce the third axis by 50%. In addition a number of candidates penalised themselves by not drawing the easiest view.  
  
There were a number of isometric and planometric views submitted.
- (b) Although most candidates used the correct technique for estimated two-point perspective, answers were generally badly proportioned.

#### **Question 4**

- (a) A common error in this question was to draw the base of the oblique cone the wrong size.
- (b) The end view was usually drawn correctly, but not in third angle orthographic projection as required in the question.  
  
It should be noted that a correctly projected view EV from a view FV of the incorrect size was not penalised.
- (c) The auxiliary view was generally projected correctly although the lower part of the truncated pyramid was often omitted.

## **Section II**

### *Optional questions*

#### **Question 5**

- (a) Although the given views were usually drawn accurately, a number of solutions showed the ellipse incorrectly positioned in the plan.
- (b) Most candidates gained full marks for the development of the truncated cylinder.
- (c) A number of candidates did not attempt this part of the question. Those who developed the transition piece were generally correct in the method used, but lost marks for inaccuracies in the final outline.

#### **Question 6**

Relatively few candidates attempted this question and there were very few accurate solutions.

Marks were limited to those given for drawing the mechanism in diagrammatic form, drawing the quadrant AD, dividing it appropriately and then attempting to determine the required locus in the plan only.

#### **Question 7**

This was another question attempted by a relatively small number of candidates. Solutions were restricted to drawing the 800mm diameter sphere, locating the 500mm and 300mm diameter spheres tangential to the 800mm sphere in the plan and then projecting this view of the assembled spheres to produce the required front view.

Surprisingly, the platform was often drawn incorrectly positioned relative to the 800mm diameter sphere.

#### **Question 8**

Questions involving roof trusses are usually answered well. Answers to this year's question, however, were disappointing.

- (a) The given view was drawn accurately to the correct scale, but a number of solutions did not show Bow's notation used correctly to identify the members.
- (b) A correct method was used, but the magnitude and direction of the two reactions were usually incorrect.
- (c) Most solutions were inaccurate.
- (d) The magnitude of the forces was generally inaccurate but the nature of the forces were usually correct.

#### **Question 9**

This question was answered well with many candidates gaining full marks.

As always, a number of solutions showed the cam rotating anti-clockwise.

<p style="text-align: center;"><b>Paper 9351/02</b> <b>Drawing: Engineering</b></p>
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**General comments**

Many candidates were to be congratulated on the presentation of their answers.

In general, most candidates produced answers as required in the question and showed a clear understanding of the assembly and purpose of the Relief Valve.

The majority of candidates completed the requirements of the question.

***Design features***

Nine marks were given for the design sketches and, despite comments made in the report on the examination for June 2003, many candidates failed to draw separate design sketches on their answer sheets.

- (i) It was expected that appropriately headed bolts/screws would be shown as a method of securing the cover plate to the top of the body and most candidates showed this method. As usual, a number of totally impractical solutions were presented and these gained little credit.
- (ii) This part of the question was answered less well. It was expected that some form of bolt with a spigot would be threaded through the cross head and located in the upper spring carrier to give the required adjustment. A lock nut would then be used to secure the bolt in position once the required adjustment had been made.

In a number of solutions, a correct method was shown but the size and proportions suggested were inappropriate, usually being too small.

- (iii) Most candidates showed the use of some form of water-tight seal as a solution, although a considerable number positioned this at the bottom end of the valve spindle. This was despite the advice given in the question regarding the position of the gland.

***Interpretation of assembly***

A total of 10 marks was given for the correct assembly of the component parts. The most common error was the failure to position the cover plate in contact with the top flange of the body.

***Accuracy of components*****Question 1**

- (a) A total of 17 marks was given for the left hand side of the centre line shown as an outside view. The principal error was a failure to show the spring accurately, for which three marks were given and the omission of the gland retaining nut for which one mark was given.

Nineteen marks were given for the right hand side of the front view shown as a section. Common errors included: inaccurate sectioning of the spring and inaccuracies of the gland.

The principal error in both halves of the front view was the size, accuracy and positioning of the spring for which candidates could lose up to five marks.

To gain the seven marks available for section shading, the angle and pitch of hatching lines had to be appropriate and adjacent components had to be shaded in the reverse direction. In addition, all the correct parts had to be shown sectioned.

Most candidates gained high marks for this part of the question.

Two marks were available for the accuracy of **Design Feature (i)**, three marks for **Design Feature (ii)** and two marks for **Design Feature (iii)**.

As has been stated earlier in this Report, many candidates lost marks for omitted or inappropriately proportioned solutions to the design problems.

- (b) Eight marks were given for accuracy of the end view above and including the cover plate and 9 marks for the remainder of the view. The most common errors were the inaccuracies of detail of the gland and the omission of the valve and valve seat seen through the 80mm diameter hole in the right hand flange of the body.

A further two marks were available for the accuracy of **Design Features (i)** and **(ii)**.

### **Drawing quality**

Up to three marks were available for quality of draughtsmanship and presentation. Many candidates gained full marks.

### **Question 2**

Most candidates gained the two marks available for an accurate symbol of projection that was in accordance with the angle of projection used in their answer.

### **Question 3**

To gain the seven marks available for the parts list a tabulated form of presentation had to be used, the quantity of each part had to be given and the material used had to be shown. There was an additional mark for the quality of presentation of the information.

Little credit was given for generic terms in the materials to be used.