

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

GEOMETRICAL AND MECHANICAL DRAWING

7040/02

Paper 2

October/November 2005

2 hours 40 minutes

Additional Materials: A2 Drawing Paper (1 sheet)
Standard drawing equipment

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name at the bottom right-hand corner of your Drawing Paper.

Use both sides of the paper.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **both** questions.

The number of marks is given in brackets [] at the end of each question or part question.

The insert contains Fig. 2 for Section 2.

You should spend 10 minutes reading carefully the text of Section 2 before answering the questions.

Arcs of circles less than 5 mm radius may be drawn freehand.

All dimensions are in millimetres unless otherwise stated.

This document consists of 4 printed pages and an insert.



Section 1

Candidates are advised to spend not more than 20 minutes on this Section.

- 1 The exploded pictorial drawing of a simple single hole paper punch is shown in Fig. 1.

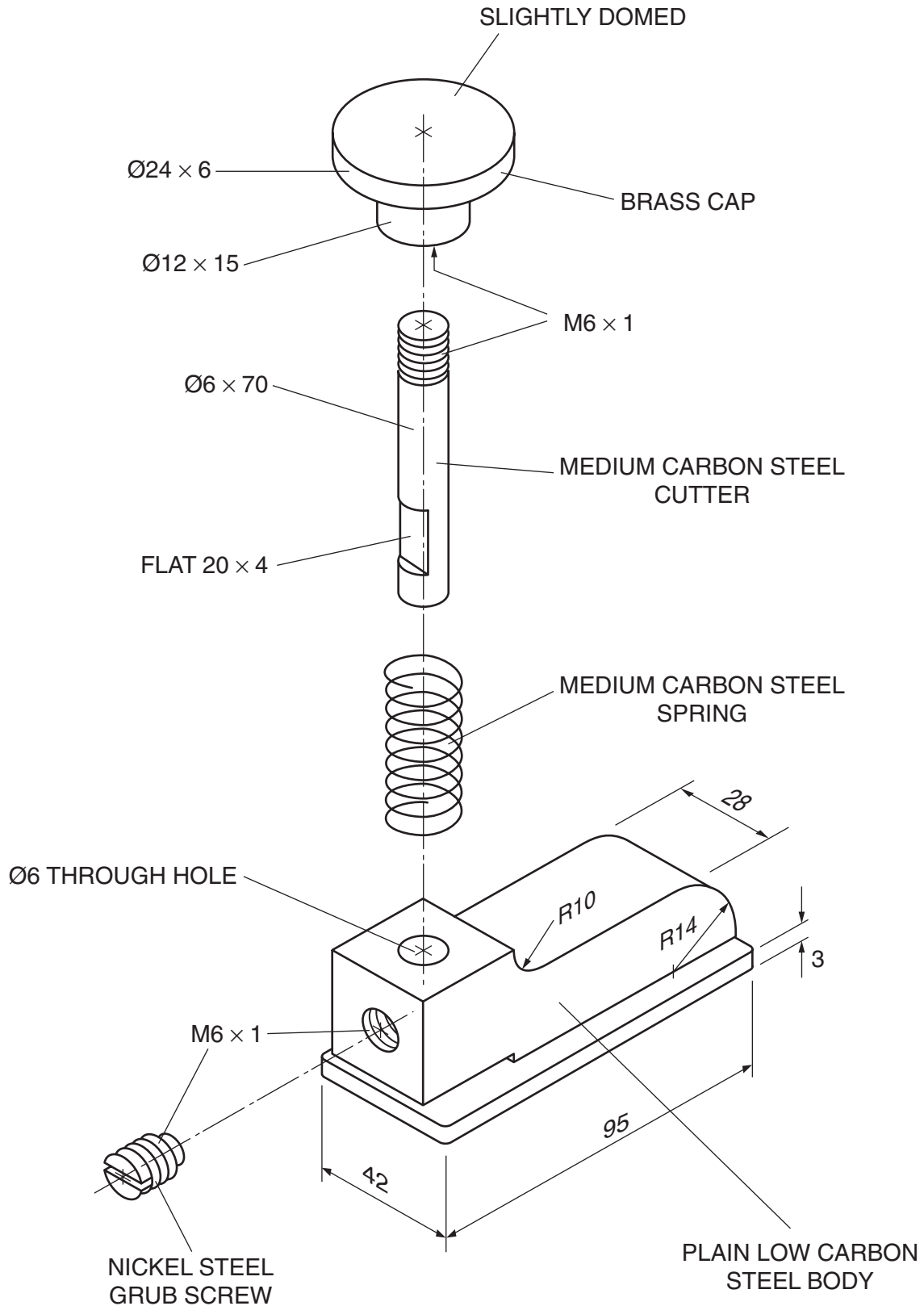


Fig. 1

- (a) Sketch freehand, in good proportion and in either first or third angle projection:
- (i) two orthographic views of the cap; [2]
 - (ii) three orthographic views of the cutter; [4]
 - (iii) three orthographic views of the body, one being an appropriate section. [5]

Estimate any dimensions not provided.
Include hidden detail in any view that is not sectioned.

- (b) Insert five dimensions on your views of the body in accordance with BS308/PD7308 recommendations. The dimensions should include:

a horizontal length;

a vertical length;

a diameter;

a radius;

and the size of a screw thread. [5]

- (c) Make a parts list for the five components of the assembly that includes a reference number, a name, the material and quantity required. [4]

The use of instruments, including any form of straight-edge, when constructing the views or when lining-in will be heavily penalised.

Section 2

- 2 Fig. 2, on the insert, shows details of a Swivel Pulley used when lifting heavy loads.

The components are assembled as follows:

The threaded end of the Fork ② is inserted into the 24 mm diameter hole in the Anchor ① until it protrudes into the 70 mm diameter hollow cylindrical chamber. The Thrust Bearing ⑧ is fitted over the M20 threaded portion and onto the 24 mm diameter shaft of the Fork, followed by the Washer ⑨. The M20 nut ⑩ is screwed onto the threaded end of the Fork until the Washer is held tightly against the shoulder of the shaft. When released, the Fork is held in position by the Washer resting on top of the Thrust Bearing whilst allowing it to rotate freely.

The Bushes ⑤ are pressed into each side of the 22 mm diameter hole of the Pulley ③ until their flanges make contact with the flat central bosses.

The Pulley is fitted between the arms of the Fork until the holes of the Bushes and the Fork are in alignment. The 16 mm diameter portion of the Spindle ④ is inserted through the 16 mm square hole in the Fork until its 24 mm diameter head makes contact with the 36 mm diameter boss.

Finally, the Collar ⑥ is positioned over the protruding end of the Spindle until in contact against the other boss and locked in place by the two Grub Screws ⑦, thereby securing the Pulley in place but allowing it to rotate freely.

- (a) Draw full size, the following views of the assembled components in first or third angle projection. Show the Pulley on the right hand side and the Anchor and Fork orientated as shown in Fig. 2.
- (i) A front elevation. [21]
 - (ii) A stepped sectional elevation, the plane of the section and the direction of the required view being indicated by **SS** on the details of the Anchor ①, Fork ② and Pulley ③. [43]
 - (iii) The upper half of a plan view in projection with (i). [10]

Hidden detail is not required in any view.

Suitable dimensions should be estimated where not provided.

- (b) On the side of your drawing paper showing the above views, draw a suitable title block, including a title and the scale used. Indicate by the BS308/PD7308 recommended symbol, the method of projection you have used. [6]