BOARD OF STUDIES
NEW SOUTH WALES

STUDENT NUMBER

CENTRE NUMBER

HIGHER SCHOOL CERTIFICATE EXAMINATION

1999

INDUSTRIAL TECHNOLOGY

2 UNIT

SECTION II
GRAPHICS AND MULTIMEDIA INDUSTRIES

OPTION—MECHANICAL DRAFTING

Total time allowed for Sections I and II—One hour and a half
(Plus 5 minutes reading time)

DIRECTIONS TO CANDIDATES

- Write your Student Number and Centre Number at the top right-hand corner of this page.
- Where appropriate, show all working for solutions neatly and clearly.
- You may use Board-approved drawing instruments and calculators.

Section II—Mechanical Drafting (15 marks)

- Question 4 is COMPULSORY.
- Attempt TWO questions from Questions 5, 6 and 7.
- Answer the questions in the spaces provided in this paper.

MARKER'S USE ONLY

Question				
4				
5				
6				
7				

SECTION II—MECHANICAL DRAFTING OPTION

(15 Marks)

QUESTION 4 This question is COMPULSORY. (5 marks)

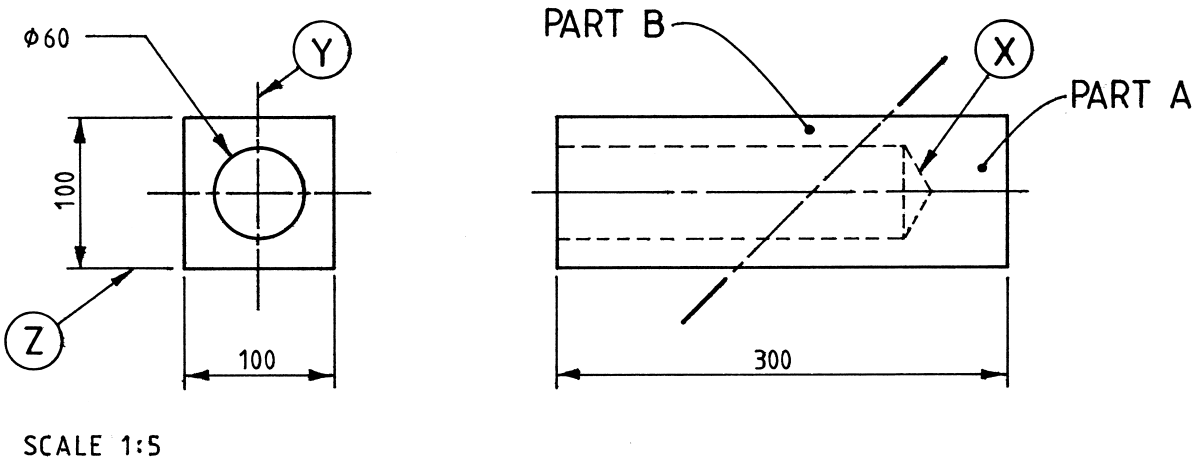


FIG. 1

The object shown in Figure 1 is drawn to scale and has its horizontal axis bisected by a section plane at 45° to the horizontal plane. The section plane divides the object into two parts (Part A and Part B).

(a) Use the space below to complete a freehand pictorial sketch of Part A. Your sketch should show the maximum detail of Part A.

QUESTION 4 (Continued)

(b) Complete below a scaled orthogonal sketch of the object (Part A only) showing sufficient views to represent every surface as a true shape. Label each view.

Question 4 continues on page 4

QUESTION 4 (Continued)

(c) (i) Determine the angle of projection used in Figure 1 on page 2.

Angle of projection .....

(ii) Sketch in the space provided below, the AS1100 Drawing Standard symbol for the angle of projection given in part (c) (i).

(d) Name the features labelled X, Y and Z in Figure 1 on page 2.

X .....

Y .....

Z .....

Attempt TWO questions from Questions 5, 6 and 7.

QUESTION 5 (5 marks)

Drawings of a wheel arbor to hold a small grinding wheel are shown below.

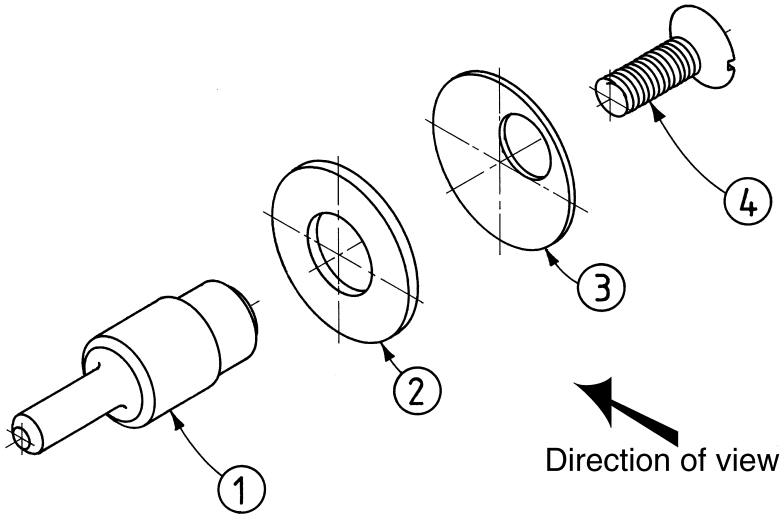


FIG. 2

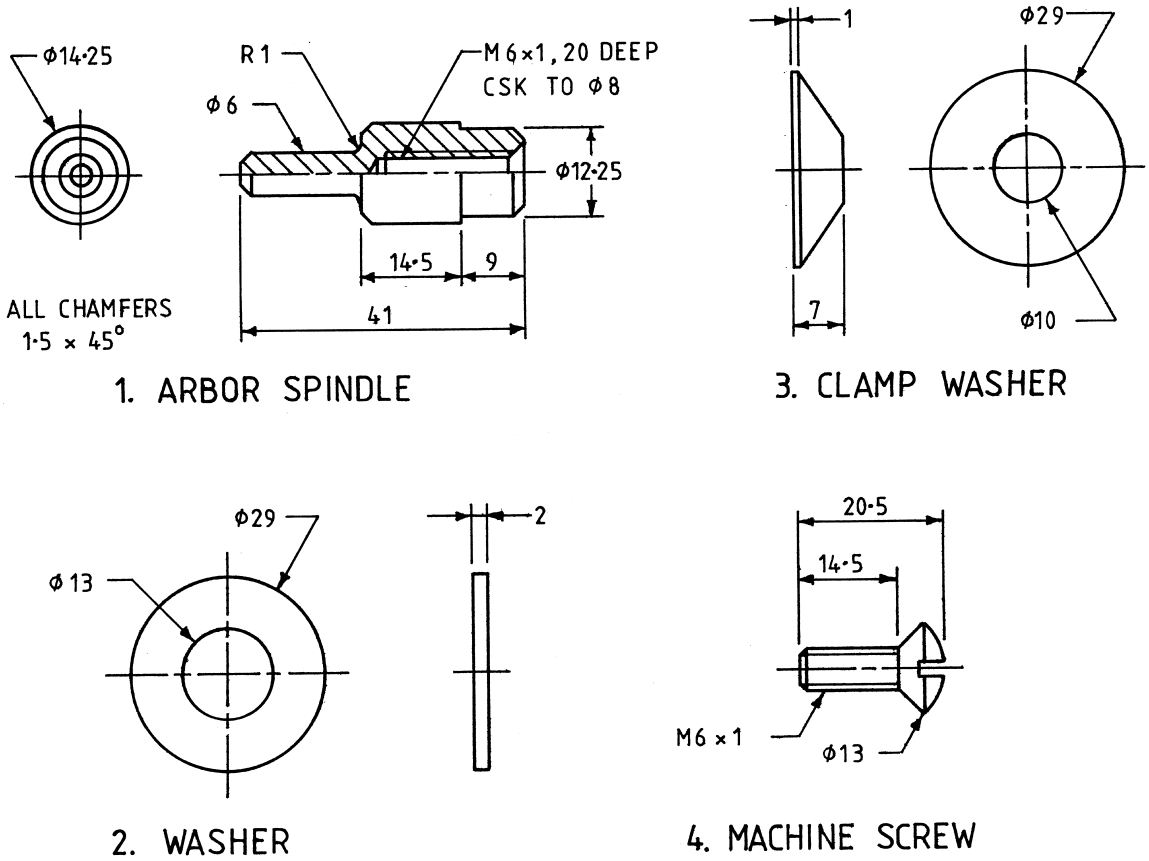


FIG. 3

Question 5 continues on page 6

QUESTION 5 (Continued)

(a) (i) Name the type of drawing shown in Figure 2 on the previous page.

.....

.....

(ii) Explain the purpose of this type of drawing.

.....

.....

(iii) Name the type of drawing shown in Figure 3 on the previous page.

.....

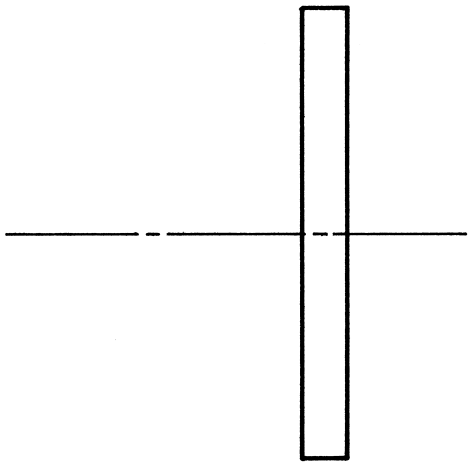
.....

(iv) Explain the purpose of this type of drawing.

.....

.....

(b) On the centre line provided below, sketch an assembled front view of the wheel arbor. The direction of viewing is indicated in Figure 2. The grinding wheel, with a ∅12·5 bore, is shown in position on the centre line.



QUESTION 5 (Continued)

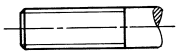
(c) Explain what is meant by unidirectional dimensioning.

.....

.....

(d) The table below indicates AS1100 symbols.

In the spaces provided in the table, explain the meaning/use of each symbol.

Symbol/Text	*Explanation*
∅	....
∅12·5 ± 0·2	....
3·6	....
	....
R1	....
M6	....

QUESTION 6 (5 marks)

(a) (i) Complete the grid below of traditional drafting tools/processes.

Tool/Process	*Application*
① Drafting machine	....
② Template	....
③	Provides an indication of materials for components in an assembly drawing.
④ Scale rules	....

(ii) Some traditional drafting tools/processes have been replaced by computers.

Name the computer *tools* that have replaced ① and ② above. Explain how each is used in industry.

Drafting machine replaced by .....

Explanation .....

.....

.....

Template replaced by .....

Explanation .....

.....

.....

.....

QUESTION 6 (Continued)

(b) Explain FOUR stages in development leading to the production of working drawings for new mechanical components.

Stage 1

.....

.....

.....

.....

Stage 2

.....

.....

.....

.....

Stage 3

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.....

.....

Stage 4

.....

.....

.....

.....

Question 6 continues on page 10

QUESTION 6 (Continued)

(c) Mechanical drafting industries have undergone rapid change in recent years. Complete the questions below by selecting a new or emerging technology relevant to the mechanical drafting industries.

(i) Explain the use of the technology you have studied.

.....

.....

(ii) Explain the technology it replaces.

.....

.....

(iii) Describe the impact of the technology in large organisations in terms of workplace reform.

.....

.....

(iv) Describe the impact of the technology on clients.

.....

.....

(v) Describe the impact this new technology has on the environment.

.....

.....

(d) Explain the purpose of *standards* such as AS1100.

.....

.....

.....

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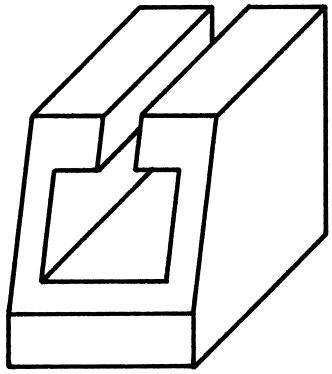
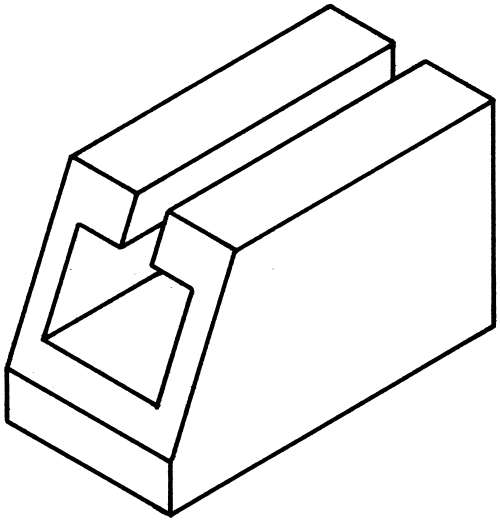
QUESTION 7 (5 marks)

(a) Three pictorial drawings of a machine component are shown below.

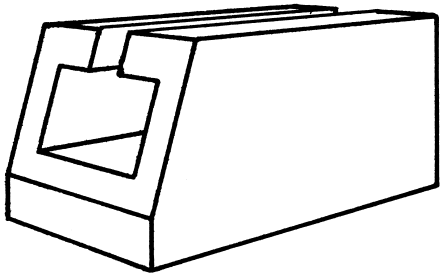
①



②



③



(i) Name the THREE types of pictorial drawings.

① .....

② .....

③ .....

Question 7 continues on page 12

QUESTION 7 (Continued)

(ii) Select ONE of the pictorial drawings and describe the steps involved in producing the drawing.

Drawing no. …….....

Steps in production of drawing

eg. Step 1 .....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(iii) Explain ONE benefit of Drawing ③ to the viewer.

.....

.....

.....

.....

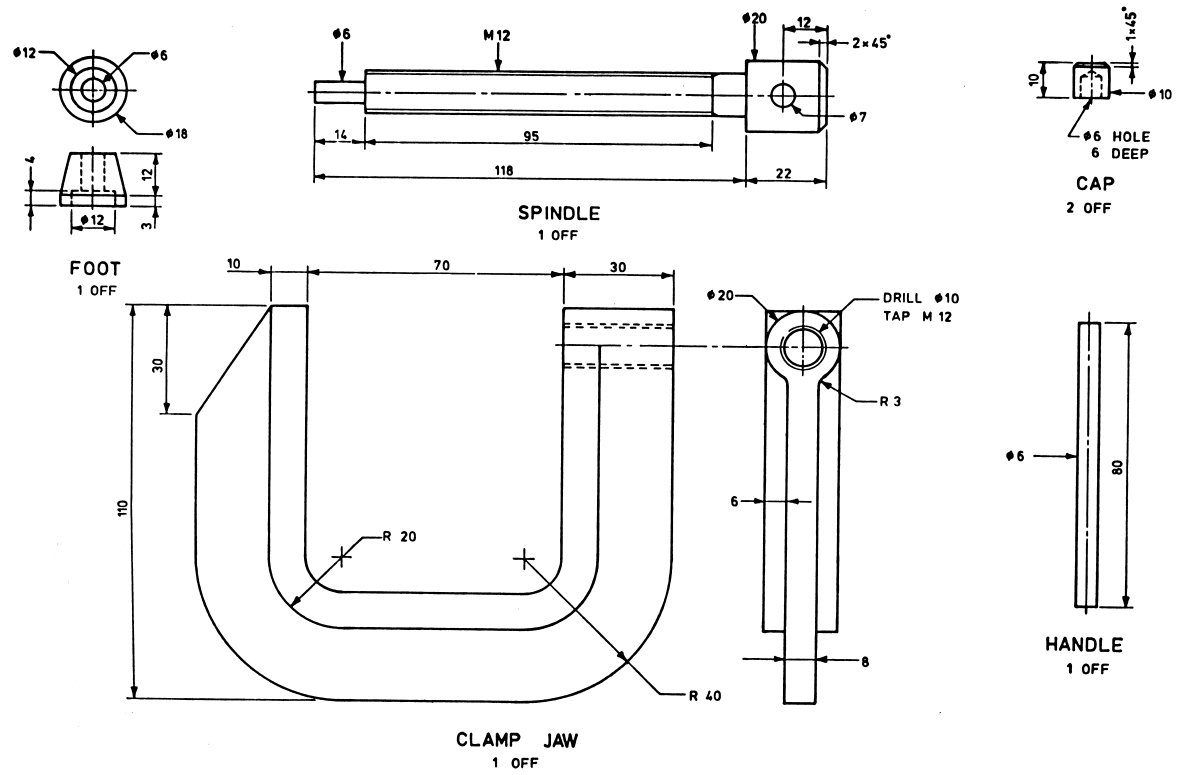
.....

.....

.....

QUESTION 7 (Continued)

(b) Details of the component parts of a G clamp are shown below.



(i) Name the type of dimensioning used on the drawing.

.....

(ii) Explain what is meant by:

1 *functional dimension*; .....

.....

2 *non-functional dimension*. .....

.....

(iii) Explain the following terms with reference to the G clamp.

1 Thread runout .....

.....

2 Chamfer .....

.....

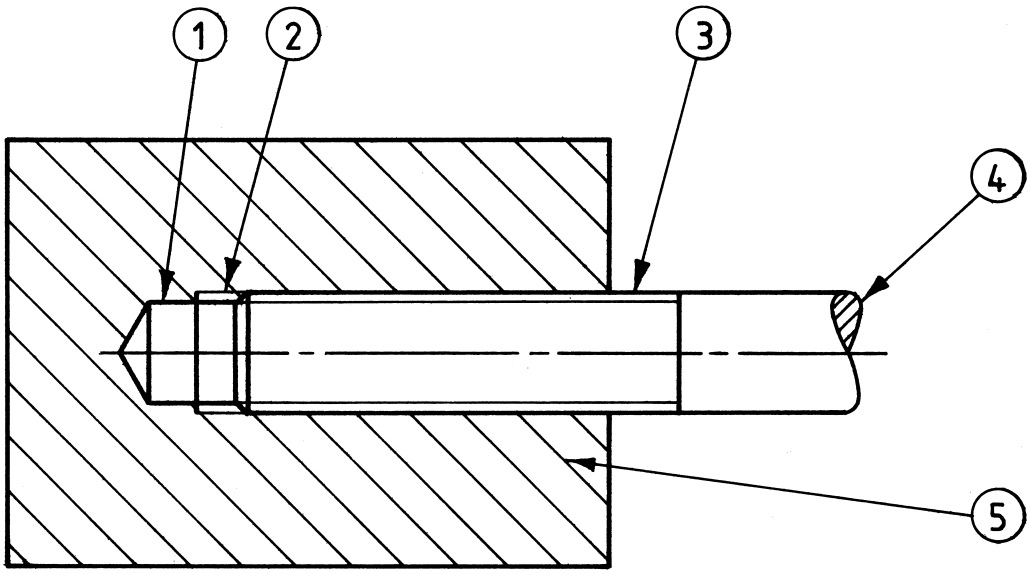
3 Counterbore .....

.....

Question 7 continues on page 14

QUESTION 7 (Continued)

(c) A sectional view of a machine assembly is shown below.



(i) Identify the following features.

① .....

② .....

③ .....

④ .....

⑤ .....

(ii) Explain the THREE stages in producing this assembly.

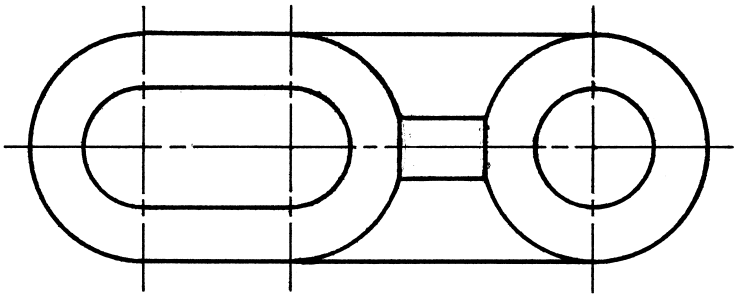
1 .....

2 .....

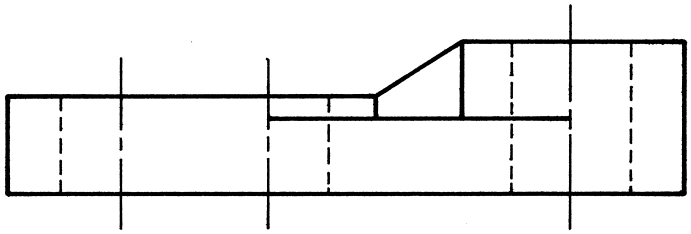
3 .....

QUESTION 7 (Continued)

(d) The link shown below is cut by a vertical section plane through its axis of symmetry.

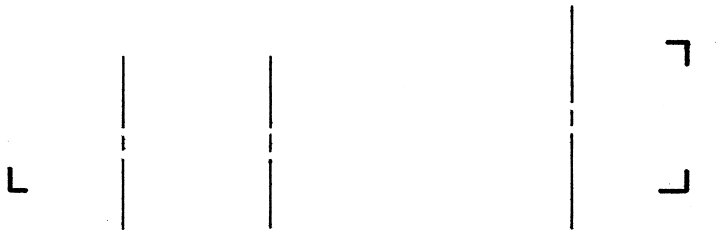


TOP VIEW



FRONT VIEW

Using the starting positions provided below, sketch a view of the sectioned link. Show the sectioned surface with hatching lines.



SECTIONAL FRONT VIEW

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