29.16 METAL WORK (445)

29.16.1 Metal Work Paper 1 (445/1)

SECTION A (40 marks)

*Answer **all** the questions in this section.*

1 (a) Name the most suitable extinguishing agent for putting out each of the following types of fires:

(i) petrol;
(ii) gas;
(iii) wood;
(iv) electrical. (2 marks)

(b) Give **two** reasons for keeping an inventory in a workshop. (2 marks)

2 (a) Give **three** reasons for marking out a work piece. (3 marks)

(b) Illustrate the following sheet metal joints and state **one** application of each:
(i) folded seam;
(ii) knocked up joint. (3 marks)

3 (a) With reference to cutting external thread:
(i) name **two** types of dies used;
(ii) state **two** reasons for using cutting oil. (3 marks)

(b) An M10 internal thread is to be cut in a mild steel plate. Given that the thread pitch is 1.5mm, determine the size of the drill to be used (2 marks)

4 Differentiate between the following:
(a) a rule and a ruler;
(b) bilateral and unilateral tolerance;
(c) trysquare and sliding bevel. (3 marks)

5 (a) What is meant by the term heat treatment as applied to ferrous metals. (1 mark)

(b) Outline the procedure of heat treating a file ready for use. (4 marks)

6 Name each rivet shown in figure 1 and state one application of each. (3 marks)

7 State **four** methods of identifying metals in a workshop. (2 marks)

8 Outline the differences between:
(a) the oxygen set and the actylene set in oxy-acetylene equipment;
(b) brazing and gas welding. (6 marks)

9 Give **two** reasons for applying primer in painting process. (2 marks)

10 Figure 2 shows orthographic view of a component.

Sketch in good proportion the isometric views of the component. (4 marks)

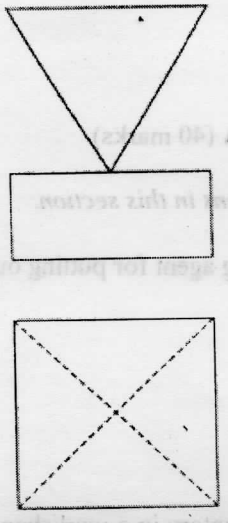

Figure 2

SECTION B (60 marks)

Answer question 11 and any other three questions from this section. Candidates are advised to spend not more than 25 minutes on question 11.

11 Figure 3 shows two views of a machined component drawn in first angle projection.

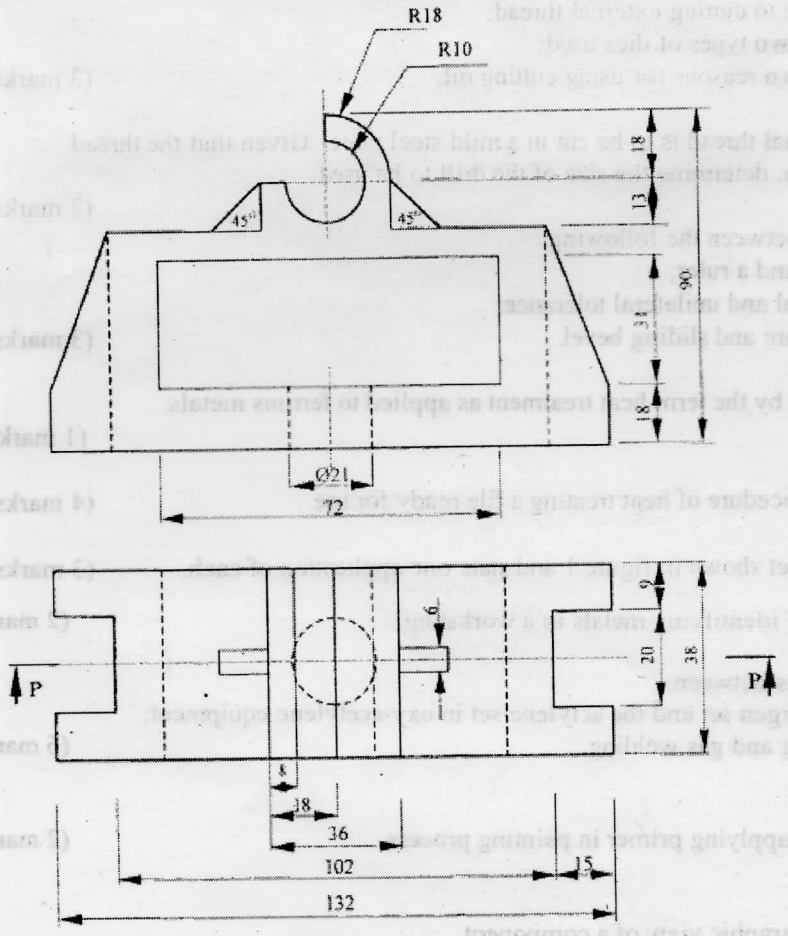

Figure 3

Draw full size, the following views:

(a) sectional front elevation through P-P. Do not show the hidden details;

(b) end elevation including hidden details. (15 marks)

12 (a) Name **three** methods of testing the quality of gas-welded joints. (1½ marks)

(b) Sketch the correct flame for welding brass and outline the procedure of setting the flame. (5½ marks)

(c) Use labelled sketch to show an appropriate technique for gas welding thick plates and give **three** reasons for using the technique. (8 marks)

13 (a) With the aid of a sketch, explain the term piping as applied to forging and state how it can be avoided. (3 marks)

(b) The end portion of a mild steel bar of cross-section 40 x 70mm is to be reduced to 20 x 70 by fullering. With the aid of sketches, outline the procedure of reducing the cross section naming the tools used in each step. (12 marks)

14 (a) Draw the following tables and show the components of each:

(i) cutting list;

(ii) bill of materials. (7 marks)

(b) Name and sketch **four** forms of metal supply and state one application of each. (8 marks)

15 (a) Outline the procedure of locating the centre of a round bar using the scribing block, surface plate and vee block. (3 marks)

(b) Figure 4 shows a micrometer screw gauge.
Name the parts labeled A to F and state the function of each. (6 marks)

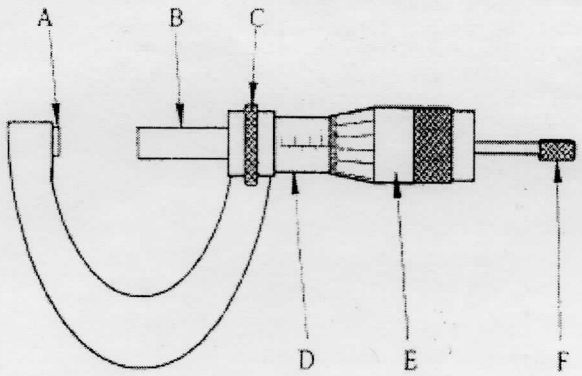

Figure 4

(c) Figure 5 shows different micrometer and vernier caliper readings.
Determine the readings and show how each is obtained. (6 marks)

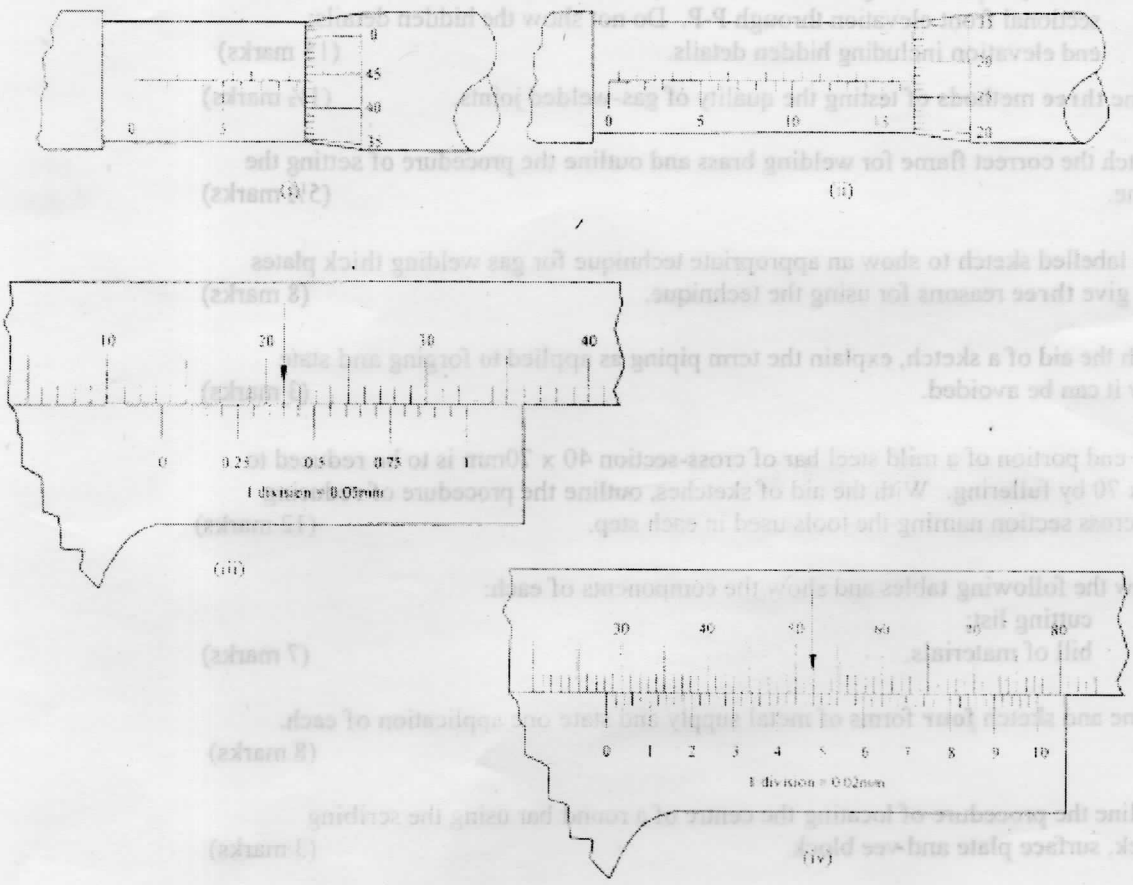

Figure 5