

SECTION A (40 marks)

Answer all the questions in this section.

- 1 (a) State **four** reasons for wearing protective clothing when grinding metal. (2 marks)
- (b) Differentiate between public and private sectors as applied to the manufacturing industry. (2 marks)
- 2 (a) State **three** ways of classifying files. (1½ marks)
- (b) State **two** uses of each of the following tools:
- (i) cross cut chisel;
- (ii) half-round file. (2 marks)
- 3 (a) State **four** uses of trammel in sheet metal work. (2 marks)
- (b) Sketch and name the most suitable hand tool for cutting internal curves in tin plate. (1½ marks)
- 4 Differentiate between physical and mechanical properties of metal and give **two** examples of each property. (4 marks)
- 5 (a) Explain the following faults as applied to gas welding:
- (i) backfire;
- (ii) flashback. (2 marks)
- (b) State **two** causes of each of the faults in (a) above. (2 marks)
- 6 Use labelled sketches to show **three** uses of vernier calipers. (4½ marks)
- 7 With the aid of labelled sketches, outline the steps of punching a hole in a metal bar on an anvil. (3 marks)
- 8 (a) State **four** differences between soft soldering and brazing. (2 marks)
- (b) Describe **three** methods of strengthening an edge of sheet metal. (3 marks)
- 9 (a) State **two** advantages of pop-riveting over snap-head riveting. (2 marks)
- (b) State **three** reasons for finishing metal surfaces. (1½ marks)
- 10 Figure 1 shows **two** orthographic views of a machined block drawn in first angle projection.

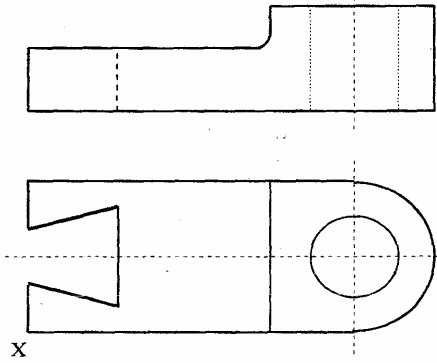


Figure 1

Sketch the isometric view of the block taking X as the lowest point.

(5 marks)

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 2 shows two views of a machined block drawn in first angle projection. Draw full size in third angle projection:

- (a) a section view along the cutting plane A-A.
- (b) a section view along the cutting plane B-B.

(15 marks)

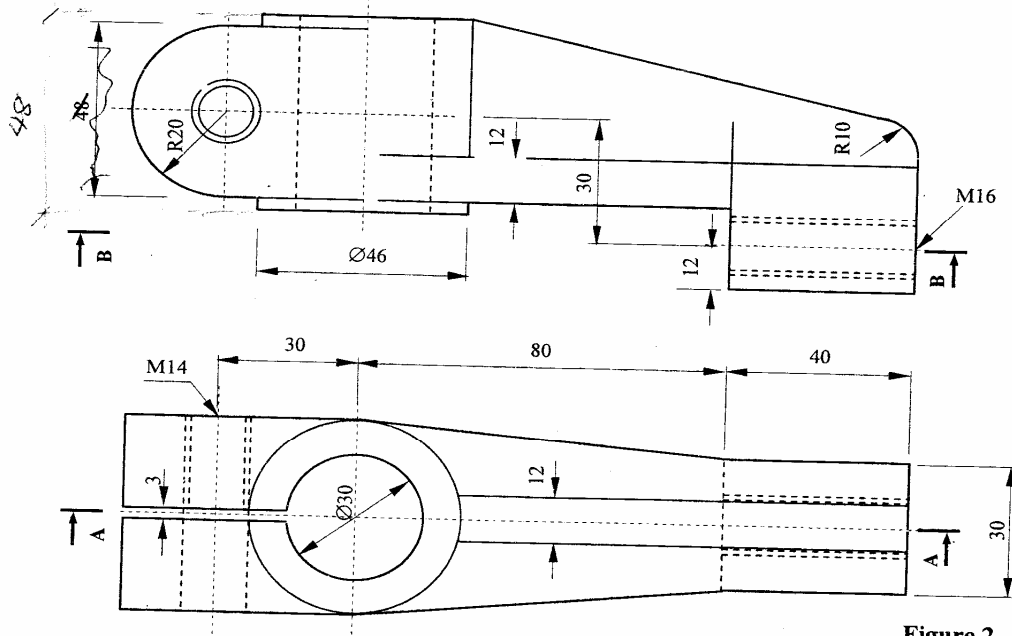
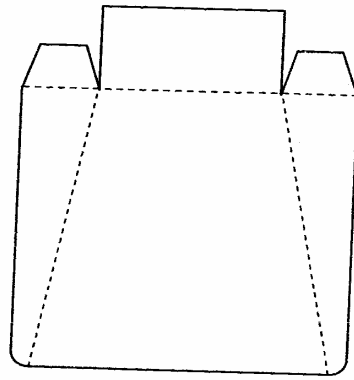


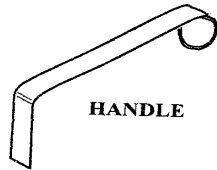
Figure 2

12 Figure 3 shows a scoop handle and the development of the body.



DEVELOPMENT
OF BODY

Figure 3



HANDLE

- (a) Sketch a pictorial view of the folded body with the handle brazed to the body. (5 marks)
- (b) Outline the procedure of: (10 marks)
- (i) folding the scoop body;
 - (ii) making the handle;
 - (iii) brazing the handle to the body.
- 13 (a) Name the most suitable metals for making each of the following items and state **two** reasons for each choice: (4½ marks)
- (i) soldering wire;
 - (ii) surface plate;
 - (iii) twist drill.
- (b) Illustrate each of the following forms of metal supply and state **two** applications of each form: (4½ marks)
- (i) zed bar;
 - (ii) angle bar;
 - (iii) square pipe.
- (c) Describe each of the following metal finishing processes: (6 marks)
- (i) bluing;
 - (ii) lacquering;
 - (iii) planishing.

14 Figure 4 shows a single cover riveted butt joint.

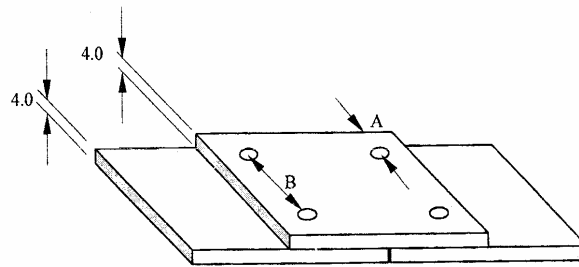


Figure 4

- (a) Using the information given in the diagram, determine:
- (i) the rivet shank diameter;
 - (ii) shank length for a snap-head rivet;
 - (iii) edge distance A;
 - (iv) pitch distance B. (6¹/₂ marks)
- (b) State **three** factors to consider when selecting the type of rivet head used. (1¹/₂ marks)
- (c) Outline the procedure of riveting the joint using snap-head rivets. (7 marks)

- 15 (a) State **three** differences between cold and hot forging. (3 marks)
- (b) Figure 5 shows a chain support eye to be made from a 6 mm silver steel rod.

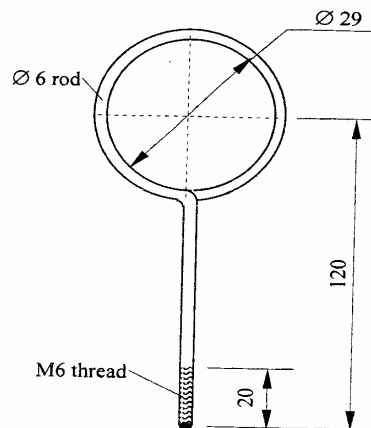


Figure 5

- (i) Determine the total length of the rod
- (ii) Outline the procedure of forming the eye
- (iii) Outline the procedure of cutting the threads. (12 marks)