

3.17 METALWORK (445)

3.17.1 Metalwork Paper 1 (445/1)

SECTION A (40 marks)

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

1. (a) Give **one** reason for studying technical drawing alongside metalwork. (1 mark)
- (b) Explain the term semi-skilled worker. (2 marks)
2. (a) State the purpose of a market survey in relation to the establishment of production of goods. (1 mark)
- (b) State the main reason for starting a business. (1 mark)
3. (a) State **two** advantages of using a dry powder type of fire extinguisher. (1 mark)
- (b) Define each of the following properties of metals: (3 marks)
 - (i) Magnetism;
 - (ii) Fusibility;
 - (iii) Ductility.
4. (a) Define each of the following terms as applied in fits and limits: (2 marks)
 - (i) Allowance;
 - (ii) Tolerance.
- (b) Outline the procedure of finding the depth of a blind hole using a combination set. (3 marks)
- (b) Give **two** reasons for beading the bodies of sheet metal containers. (2 marks)
- (c) State the use of a folding bar. (1 mark)
6. (a) State **one** effect of each of the following in riveting: (3 marks)
 - (i) Drilling the plates separately;
 - (ii) Cutting the rivet tail with pliers;
 - (iii) Leaving burrs on the drilled hole.

- (b) Explain each of the following terms as applied in brazing: (2 marks)
- (i) Braze welding;
 - (ii) Capillary action.
7. (a) State **four** factors that affect the quality of work in an arc welded joint. (4 marks)
- (b) Give the use of each of the following parts of a lathe machine: (3 marks)
- (i) Cross slide;
 - (ii) Compound slide;
 - (iii) Head stock.
8. Explain each of the following terms as applied in the heat treatment of steel: (2 marks)
- (a) Decalescence;
 - (b) Recalescence.
9. Using labelled sketches, differentiate between upsetting and drawing down in forging. (3 marks)
10. Explain each of the following terms as applied in painting: (3 marks)
- (a) Charging;
 - (b) Runs;
 - (c) Dipping.



SECTION B (60 marks)

Answer question 11 on the A3 paper and any other three questions from this section in the spaces provided. Candidates are advised to spend not more than 25 minutes on question 11.

11. Figure 1 shows a shaped block drawn in isometric projection.

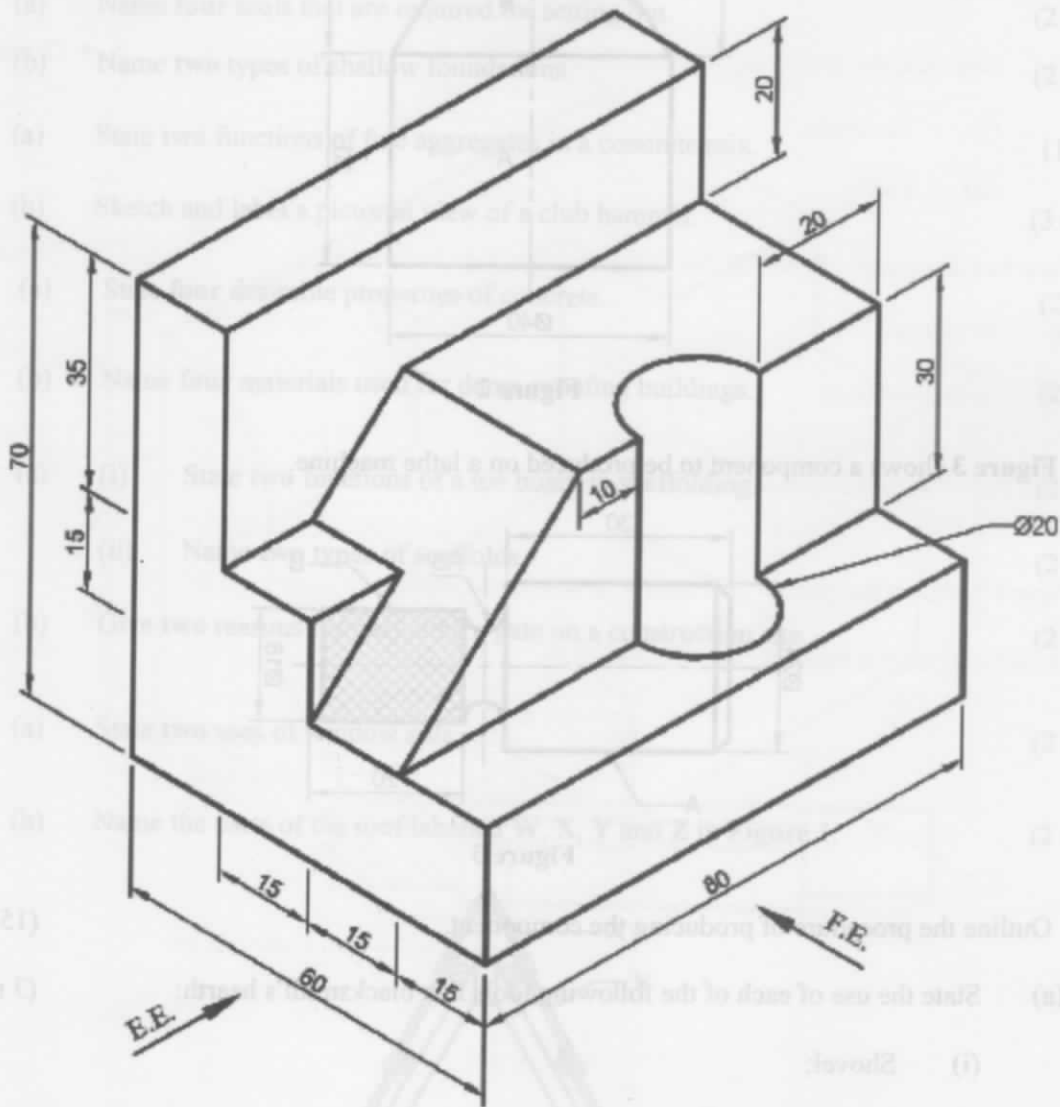


Figure 1

Draw the following views **Full Size** in first angle projection:

- (a) Front elevation in the direction of arrow F.E;
- (b) End elevation in the direction of arrow E.E;
- (c) Plan.

(15 marks)

12. **Figure 2** shows an oil can which consists of a cylindrical body A and a truncated conical top B. Draw the surface development of part B when opened on the shorter side. (15 marks)

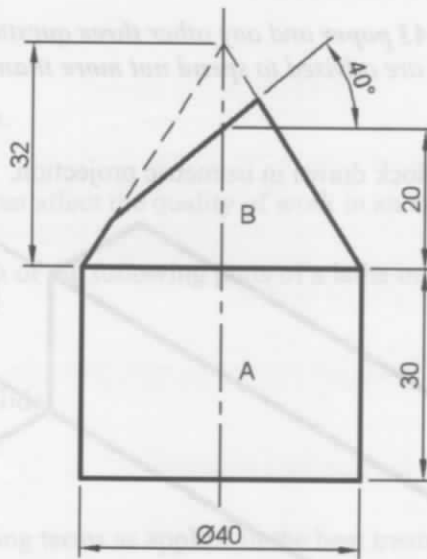


Figure 2

13. **Figure 3** shows a component to be produced on a lathe machine.

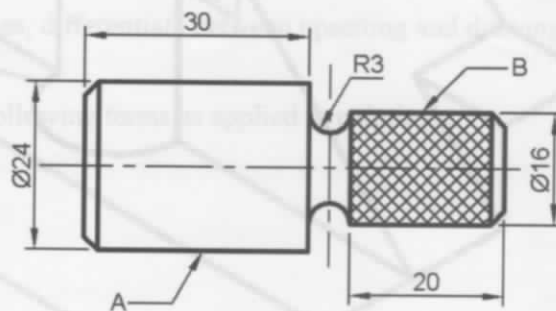


Figure 3

Outline the procedure of producing the component. (15 marks)

14. (a) State the use of each of the following tools in a blacksmith's hearth: (3 marks)
- Shovel;
 - Poker;
 - Rake.
- (b) With the aid of sketches, outline the procedure of forging a square head of a bolt from a round shaft. (12 marks)
15. (a) Use sketches to show **two** methods of starting an arc in arc welding. (6 marks)
- (b) With the aid of sketches, outline the procedure of locating the centre of a round bar using the centre head of a combination set. (9 marks)