

### 4.3 METALWORK (445)

#### 4.3.1 Metalwork Paper 1 (445/1)

#### SECTION A (40 marks)

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

1. (a) Give **two** reasons for studying metalwork in secondary school. (2 marks)
- (b) Distinguish between the **two** types of prices in buying and selling of goods. (2 marks)
2. (a) State the importance of following the correct procedure when carrying out a task in the workshop. (1 mark)
- (b) State the precaution to be taken when lifting heavy loads manually. (2 marks)
3. (a) Explain the use for marking agents in metalwork. (2 marks)
- (b) Give **two** examples of marking agents. (1 mark)
4. (a) Outline the procedure of checking a surface for flatness using a straight edge. (3 marks)
- (b) With reference to marking out: (3 marks)
  - (i) Define the term "datum".
  - (ii) State **two** ways of minimising parallax error when using a scriber.
5. State **three** common causes of blade breakage when cutting using a hacksaw. (3 marks)
6. (a) Sketch a creasing iron and give **two** uses of the iron. (3 marks)
- (b) Outline the procedure of separating a countersunk riveted joint. (3 marks)
7. (a) Give **one** reason for doing each of the following:
  - (i) Cooling brazed joint in air rather than water
  - (ii) Packing the work with fire bricks while brazing (2 marks)
- (b) State the reason for doing each of the following in gas-welding: (3 marks)
  - (i) Manipulating the torch
  - (ii) Cracking the equipment
  - (iii) Using flux

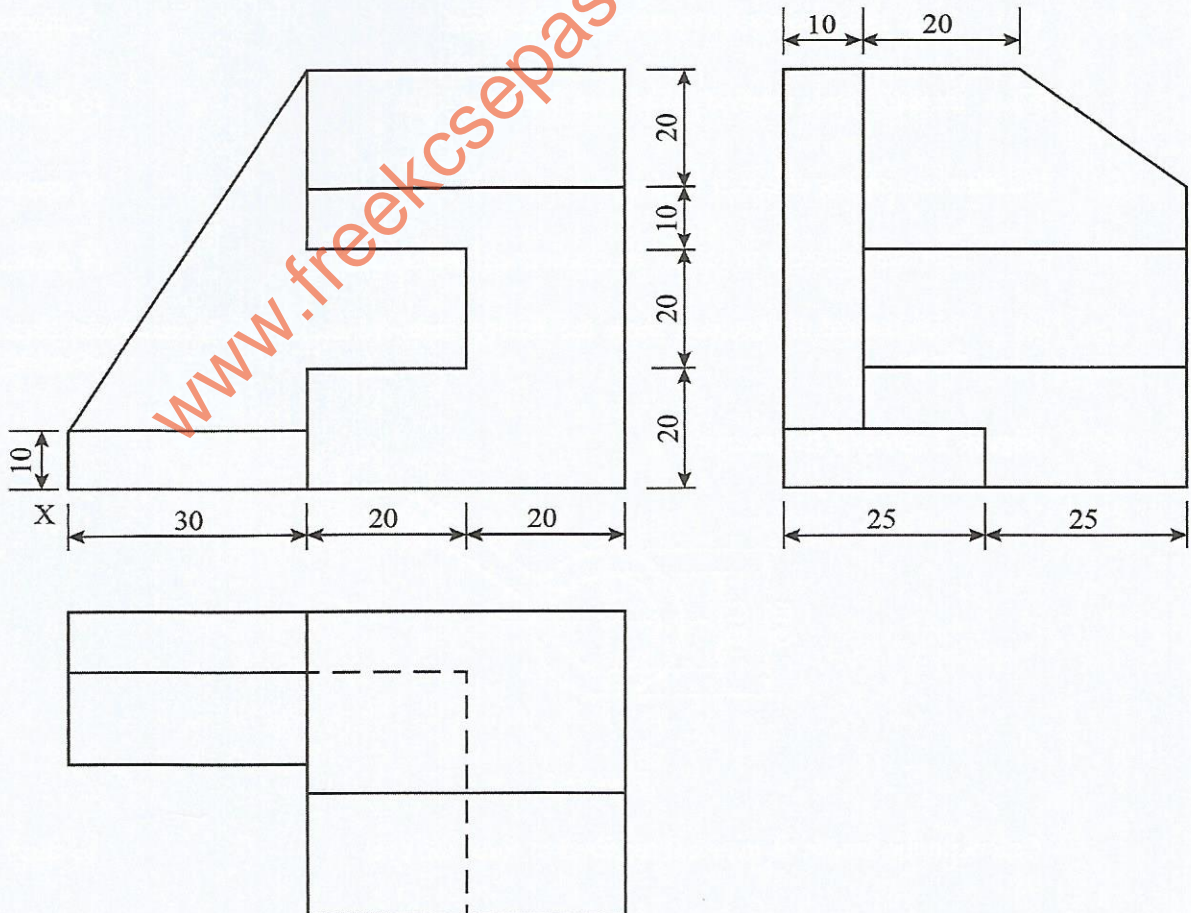


8. Use sketches to show the effects of each of the following when facing on a lathe: (4 marks)
- (a) Setting the tool too high
  - (b) Setting the tool too low
9. Explain each of the following terms as applied in heat treatment of steel: (3 marks)
- (a) Lower critical point
  - (b) Upper critical point
  - (c) Critical range
10. (a) State **two** reasons for upsetting a metal bar prior to bending. (3 marks)

**SECTION B (60 marks)**

Answer **question 11** on the A3 paper provided 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.

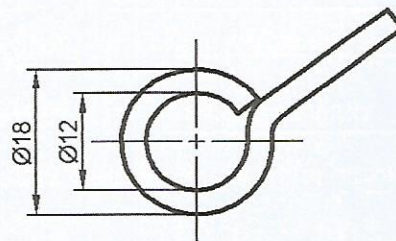
11. **Figure 1** shows three orthographic views of a block drawn in first angle projection. Draw the block **Full Size** in isometric projection (15 marks).



**Figure 1**



12. (a) State **two** advantages of each of the following types of drills: (4 marks)
- Parallel shank drills
  - Taper shank drills
- (b) With the aid of sketches, show the use of a drift in drilling. (5 marks)
- (c) Sketch the following drilling accessories and explain the use of each: (6 marks)
- Drill sleeve
  - Drill socket
13. (a) Sketch each of the following patterns as used in arc welding: (4 marks)
- Crescent weave
  - Straight weave
- (b) Illustrate the movement of the electrode when starting a weld using the tap method. (3 marks)
- (c) (i) State **two** reasons for testing a welded joint. (2 marks)
- (ii) Explain **three** methods of testing a welded joint. (6 marks)
14. (a) Illustrate the piping effect in forging. (2 marks)
- (b) (i) Outline the steps to follow in eliminating the piping effect. (4 marks)
- (ii) With the aid of sketches, show the difference in the use of a cold chisel and a hot chisel. (6 marks)
- (c) **Figure 2** shows a forged eye. (3 marks)



**Figure 2**

Calculate the length of material required to form the eye. (3 marks)

15. (a) Give **three** reasons for using beaded edge on sheet metal articles. (3 marks)
- (b) With the aid of sketches, outline the procedure of making a beaded edge. (5 marks)
- (c) Sketch to show a grooved punch in use. (3 marks)
- (d) Outline the procedure of soldering seams to make them water tight. (4 marks)

www.freeksepastpapers.com