



**UNIVERSITY OF SWAZILAND
SUPPLEMENTARY EXAMINATION PAPER**

PROGRAMME: BSC ABE. II

COURSE CODE: ABE 207

TITLE OF PAPER: WORKSHOP TECHNOLOGY

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO
OTHER QUESTIONS.**

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GRANTED BY THE CHIEF INVIGILATOR**

SECTION I COMPULSORY

QUESTION 1

a) Indicate the naming and dimensioning parameters of the metals provided in the Table 1 on page 5 of 5. The first one is done for you. Submit the sheet with your answer script. [16 marks]

b) List the measurements you can obtain using a try square. [8 marks]

c) Figure 1 shows four types of cold chisels for workshop activities.

(i) Name the chisels [8 marks]

(ii) Name the uses of each of the chisels in the figure. [8 marks]

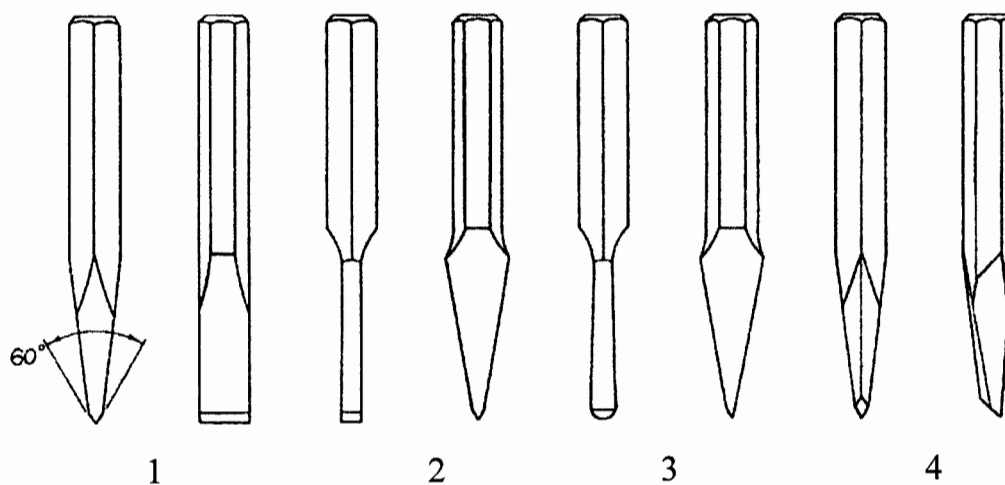


Figure 1. Cold chisels

SECTION II ANSWER ANY TWO QUESTIONS**QUESTION 2**

- a) Distinguish between a hand file and a flat file? [8 marks]
- b) Black board chalk is widely used during filing operations.
(i) What is the function of chalk in the filing process? [5 marks]
(ii) How does chalk achieve the functions in (i) above? [5 marks]
- c) None metals play a major role in engineering applications.
(i) Name two non-metals. [4 marks]
(ii) What properties of the two non-metals make them important for use as engineering projects? [4 marks]
(iii) Give an example of engineering applications where each non-metal can be used. [4 marks]

QUESTION 3

- a) Distinguish between ferrous and non-ferrous metals. [4 marks]
Give three examples of metals in each category of metals. [6 marks]
- b) Briefly explain the following terms as used in heat treatment of steel:
(i) Tempering;
(ii) Annealing;
(iii) Quenching; and
(iv) Case hardening. [12 marks]
- c) Why are common metal tools made from hard carbon steels or high speed steels instead of mild steel? [8 marks]

QUESTION 4

- a) Describe two major types of joints used to assemble components together and give examples of where they are used.

[6 marks]

Give advantages and disadvantages of each type of the joints above.

[8 marks]

- b) Define welding.

[3 marks]

Conventional understanding of welding tends to be associated with arc welding that requires electricity supply to the workshop. Is it possible to still weld in off-grid rural Swaziland? In case it is possible, state the type of welding that would be used.

[5 marks]

- c) An electrode for arc welding has the mark E6013 showing its group according to ISO (International Standards Organisation). Explain the information expressed in the group mark.



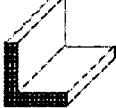



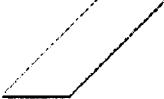


[8 marks]

CANDIDATES' ID NO. _____

(Submit this sheet with your answer script.)

QUESTION 1 a)

Table 1. Naming and dimensioning of metal

| Section | Naming of material | Dimensioning parameters |
|---|--------------------|-------------------------|
|  | Round tubing | Diameter and thickness |
|  | | |
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