



**UNIVERSITY OF SWAZILAND
FINAL 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) Define the following properties of engineering materials:
- (i) Toughness;
 - (ii) Strength;
 - (iii) Malleability;
 - (iv) Hardness.
- [12 marks]
- b) What are the technical processes that a product undergoes before its commissioning to use?
- [8 marks]
- c) Steel is the most commonly used metal for workshop processes. Classify the major groups of steel and give examples where the groups are mainly used.
- [10 marks]
- d) Sharpening of tools in rural Africa has been done on stones accompanied by water. Discuss the use of water in sharpening tools with a critic on the common practice of using a power grinding stones without water.
- [10 marks]

SECTION II ANSWER ANY TWO QUESTIONS

QUESTION 2

- a) Figure 1 shows the teeth of a heavy duty power saw blade. Name the labelled angles.

Briefly explain the importance of the angles.

[10 marks]

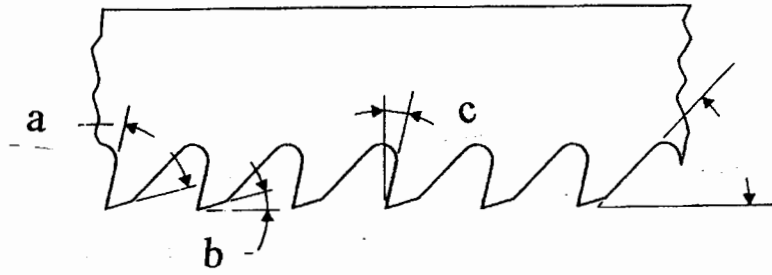


Figure 1. arrangement of cutting teeth of a power saw blade.

- b) Name five common types of files used in agricultural workshops
[10 marks]
- c) Briefly explain draw filing and cross filing indicating their differences in filing process, quality of surface finish achieved and applications under which each method is used.

[10 marks]

QUESTION 3

- a) Grid electricity has made the operation of agricultural workshops very productive. Discuss the advantages and disadvantages of power tools
[10 marks]
- b) Discuss the advantages and limitations of using cold rolled steel as compared to hot rolled steel in agricultural workshops.
[10 marks]
- c) Discuss the importance of FINISHING in the production of any component.

[10 marks]

QUESTION 4

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

[4 marks]

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

[8 marks]

- b) (i) Define welding.

[3 marks]

Conventional understanding of welding tends to be associated with arc welding that requires electricity supply to the workshop.

- (ii) State the different types of welding.

[5 marks]

- (iii) Which type of welding can be used in off-grid regions of Swaziland?

[2 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]