



# MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION AND EXTENSION)

AGN 113: INTRODUCTION TO WORKSHOP TECHNOLOGY

DATE: 22/6/2021

TIME: 2.00-4.00 PM

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## INSTRUCTIONS:

Answer *ALL* questions from Section A and any other *TWO* from Section B:

### SECTION A: COMPULSORY: (30 MARKS)

#### QUESTION ONE (30 MARKS)

- a) Describe the steps of casting a cylinder head. (5 marks)
- b) Distinguish between open fire and stock fire as used in forging. (4 marks)
- c) Describe the process of making a dry sand core. (5 marks)
- d) Explain the following as it is used in metal working:
  - i. Rolling (2 marks)
  - ii. Drawing (2 marks)
- e) Explain six advantages and six disadvantages of welding (6 marks)
- f) Explain SIX general safety measures used in carpentry shop accordance to the Occupation Safety and Health (OSH) Act of 2007. (6 marks)

### SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

#### QUESTION TWO (20 MARKS)

- a) With clear comparison show the difference between permanent mold casting and die casting. (4 marks)
- b) Describe the stretch forming operation as used in workshop technology. (8 marks)

- c) With an aid of well labelled sketches explain each of the following type of extrusions.
- i. Direct Extrusion (4 marks)
  - ii. Indirect Extrusion. (4 marks)

**QUESTION THREE (20 MARKS)**

- a) With an aid of a well labelled sketch describe each of the following rolling operations.
- i. Three high Rolling (4 marks)
  - ii. Four High Rolling (4 marks)
- b) Describe three common materials used for making patterns. (6 marks)
- c) Explain three ways in which defects can be removed during forging process in a workshop. (6 marks)

**QUESTION FOUR (20 MARKS)**

- a) Explain the following terms as used in arc welding:
- i. Components of arc welding (5 marks)
  - ii. Welding Defects (5 marks)
- b) Explain **three** methods of brazing as a form of material joining. (6 marks)
- c) Describe the basic operations in soldering. (4 marks)

**QUESTION FIVE (20 MARKS)**

- a) Describe **four** types of rolling mills in production of metallic bars. (8 marks)
- b) As a workshop instructor, describe the process in which a handsaw is used in cutting wood in a workshop. (6 marks)
- c) Explain **three** factors that affect selection of pattern material in the process of making a cast. (6 marks)