



# MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AGN 113: INTRODUCTION TO WORKSHOP TECHNOLOGY

DATE: 25/11/2020

TIME: 8.30-10.30 AM

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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) Safety in a workshop is enshrined in the OSH Act of 2007. Explain **six** general safety requirements in a workshop as given in the Act. (6 marks)
- b) Explain **four** common types of files used in a workshop. (4 marks)
- c) Explain **four** advantages of a wooden pattern compared to metallic pattern as used in casting. (4 marks)
- d) Explain the following forms of fire as used in forging (4 marks)
  - i. Open Fire (2 marks)
  - ii. Stock Fire (2 marks)
- e) Describe the **two** methods of brazing as used in joining metals in a workshop. (4 marks)
- f) Explain **three** advantages and **three** disadvantages of welding (6 marks)
- g) Explain the following as it is used in metal working:
  - i. Hot Spinning (2 marks)
  - ii. Hot Drawing (2 marks)

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

### QUESTION TWO (20 MARKS)

- a) Describe the steps of casting a cylinder head of a four-stroke engine. (8 marks)
- b) Describe the following power tools used in a workshop:
  - i. Portable Circular Saw (3 marks)
  - ii. Portable Drill (3 marks)
- c) Explain **six** safety precautions to be adhered to when using power tools in the workshop. (6 marks)

### QUESTION THREE (20 MARKS)

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

### QUESTION FOUR (20 MARKS)

- a) Important hot working process of metal is through rolling. 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 can be used in cutting wood in a workshop. (6 marks)
- c) Explain **three** factors effecting selection of pattern material in the process of making a cast. (6 marks)

### QUESTION FIVE (20 MARKS)

- a) Describe **four** common forging operations. (8 marks)
- b) Explain with an aid of a neat sketch the following extrusions
  - i. Direct Extrusion (4 marks)
  - ii. Indirect Extrusion. (4 marks)
- c) Describe **four** ways in which defects can be removed during forging process in a workshop. (4 marks)