



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: 9/12/2020

TIME: 8:30 – 10:30 AM

INSTRUCTIONS:

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

SECTION A: COMPULSORY:

QUESTION ONE (30 MARKS)

- a) Describe the three major types of handsaws used in a wood workshop. (4 marks)
- b) Describe six general safety measures used in carpentry shop in accordance to the OSH Act of 2007. (6 marks)
- c) Distinguish between mould cavity and pattern in large-scale production of a mould. (4 marks)
- d) Describe four advantages of a wooden pattern to metallic pattern as used in casting. (4 marks)
- e) Distinguish between open fire and stock fire as used in forging? (4 marks)
- f) Discuss the operation of making a dry sand core. (4 marks)
- g) Define the following as it is used in metal working:
 - i. Rolling (2 marks)
 - ii. Drawing (2 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

- a) In oxy-acetylene welding, flame is the most important means to control the welding joint and the welding process. Discuss the three basic types of this flame. (9 marks)
- b) Discuss the factors effecting selection of pattern material in the process of making a cast. (6 marks)
- c) Casting is a process in which molten metal flows by gravity or other force into a mould where it solidifies in the shape of the mould cavity. Discuss the steps of casting a cylinder head. (5 marks)
- d) Discuss the following power tools used in a workshop:
- i. Portable Circular Saw (4 marks)
 - ii. Portable Drill (4 marks)

QUESTION THREE (20 MARKS)

- a) For making soldered joints, operations are required to be performed sequentially. Discuss the basic operation in soldering. (4 marks)
- b) Discuss the following types of hammers as used in workshops:
- i. Cross pein hammer (3 marks)
 - ii. Planishing Hammer (3 marks)
- c) Brazing is a form of material joining. Discuss the various methods of brazing. (6 marks)
- d) Explain the Principle of wire drawing operation. (4 marks)

QUESTION FOUR (20 MARKS)

- a) Explain with a sketch following Rolling operations:
- i. Three high Rolling (4 marks)
 - ii. Four High Rolling (4 marks)
- b) In the process of casting, there is need to prepare a pattern material which of different types. Discuss the common materials used for making patterns. (6 marks)
- c) Discuss the ways in which defects can be removed during forging process in a workshop. (6 marks)

QUESTION FIVE (20 MARKS)

- a) With clear comparison show the difference between permanent mold casting and die casting. (4 marks)
- b) Explain the stretch forming operation. (8 marks)
- c) Explain with a sketch the following types of extrusions
 - i. Direct Extrusion (4 marks)
 - ii. Indirect Extrusion. (4 marks)