# MURANG'A UNIVERSITY OF TECHNOLOGY

## SCHOOL OF AGRICULTURE AND ENVIRONMENTAL STUDIES

### DEPARTMENT OF AGRICULTURE

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

**THIRD** YEAR **SECOND** SEMESTER EXAMINATION FOR BACHELOR

OF SCIENCE IN AGRICULTURE

GAC 312 – FARM STRUCTURES AND MECHANIZATION

DURATION: 2 HOURS

**<u>INSTRUCTIONS TO CANDIDATES:</u>**

1. Answer question ONE any other two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

**SECTION A - ANSWER ALL QUESTIONS IN THIS SECTION**

**QUESTION ONE (30 MARKS)**

a) Define farm structure and give three examples of farm structures and their functions.
(5 marks)

b) Define farmstead planning and state when it is done. (2 marks)

c) State the factors to consider when siting a farm structure. (3 marks)

d) Define the following terms as used in concrete technology: (4 marks)
    i.    Batching
    ii.    Curing
    iii.    Grading
    iv.    Workability

e) Describe the source of farm power used in farm operations. (6 marks)

f) State and differentiate types of agricultural tractors. (2 marks)

g) With the aid of a diagram, outline the components of a mould board plough. (4 marks)

h) Differentiate between two stroke devices and four stroke cycle engine. (4 marks)

**SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION**

**QUESTION TWO (20 MARKS)**

a) Explain six parts of a zero grazing unit. (6 marks)

b) Highlight six maintenance practice of a plunge dip. (6 marks)

c) Explain the uses of fence in the farm. (6 marks)

d) State four factors considered while siting a bee hive. (2 marks)

**QUESTION THREE (20 MARKS)**

a) State five differences between petrol and diesel engines. (5 marks)

b) Name five parts of internal combustion engine and give their functions. (5 marks)

c) Name three types of speed governors. (2 marks)

d) Explain the following as used in internal combustion engine.
    i.    Compression ratio
    ii.    Blasting

**QUESTION FOUR (20 MARKS)**

a) Explain the following concepts as used in farm mechanization: (5 marks)
    i.    Wheel base
    ii.    Ground clearance
    iii.    Track
    iv.    Cage wheels
    v.    Stroke bore ratio

b) A 4 bottom 40 cm mould board plough is operating at 5.5 km/h speed with 75% field efficiency. Calculate what is the rate of doing work in hectors per hour. (5 marks)

c) Explain the procedure of calibration of seed drill. (5 marks)

d) If an engine has a clearance volume of $100cm^3$ and swept volume of $800cm^3$, calculate the compression ratio. (5 marks)