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(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR

THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATIONS

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE
EDUCATION AND EXTENSION & BACHELOR OF SCIENCE IN
AGRICULTURAL ECONOMICS AND RESOUC E MANAGEMENT.**

COURSE CODE: AEN 311/SAB 140

COURSE TITLE: FARM POWER AND MACHINERY

DATE: 14TH JANUARY 2022

TIME: 8 – 10 AM

INSTRUCTIONS TO CANDIDATES

Answer Question ONE and any other TWO Questions.

TIME: 2 Hours

This paper consists of 2 printed pages. Please Turn Over



KIBU observes ZERO tolerance to examination cheating

QUESTION ONE = 30 MARKS (Compulsory)

- 1) Briefly discuss the reason for slow Adoption of tractorization in Kenya (4 Marks)
- 2) Explain the different types of cooling systems for internal combustion engines (3 Marks)
- 3) Explain in a 2 cycle engine, intake and exhaust occur at almost the same time. (4 marks).
- 4) a) Estimate the piston displaced for the engine of a water pump with a bore of 6 cm and stroke of 7 cm. (2 Marks).

b) Calculate the engine displacement if it is a two cylinder engine (1 Mark).
- 5) What is the compression ratio for a single cylinder engine with a Bore and Stroke of $6\text{ cm} \times 5.3\text{ cm}$ and a clearance volume of 6.20 cm^3 ? (3 Marks)
- 6) Explain the process that takes place in the threshing chamber of a combine harvester. (3 Marks).
- 7) Briefly describe the main reasons for the low adoption of conservation agriculture implements in Kenya (5 Marks).
- 8) Outline why draw bar power is less than engine power in a typical tractor (5 Marks)

QUESTION TWO = 20 MARKS

- a) Highlight the main difference between petrol and diesel engines. (8 Marks).
- b) Explain using diagrams the below process in a two –stroke cycle engine (12 Marks).

Intake and Exhaust

Compression

Ignition and Power

QUESTION THREE = 20 MARKS

- (a) With the help of a diagram, describe five components of a Disc plough and state the function of each component. (10 marks).
- (b) Describe five losses that a machinery manager should minimize in forage harvesting. (5 marks).
- (c) List five advantages of a Disc plough over a Mould board plough. (5 marks).

QUESTION FOUR = 20 MARKS

4. a) Briefly describe the two general types of rakes (11 Marks)
- b) State the three forms fertilizers that are applied. (3 Marks).
- c) List six factors that affect spray concentration per acre in calibrating a farm sprayer. (6 Marks).

QUESTION FIVE = 20 MARKS

5. a) Briefly outline four main objectives of estimating field capacities of Farm machinery. **(4 marks)**
- b) Briefly explain why agricultural equipments with wider operating widths have slightly lower field efficiency compared to implements with narrow widths. **(4 Marks)**.
- c) Elaborate on the current trend where there is a higher demand for semi-mounted/mounted implements than trailing ones? **(12 Marks)**.