



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRIBUSINESS MANAGEMENT AND TRADE

FIRST YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AGN 122: BASIC FARM POWER AND UTILIZATION

DATE: 19/01/2021

TIME: 8.30-10.30 AM

INSTRUCTIONS:



Instructions: Answer question ONE and any other TWO questions

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University Examinations for 2019/2020 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

~~FIRST YEAR FIRST SEMESTER SUPPLEMENTARY/SPECIAL EXAMINATION FOR
THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND
EXTENSION~~

~~AGN 122: BASIC FARM POWER AND UTILIZATION~~

Examination Irregularity is punishable by expulsion

Page 1 of 3

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TIME: _____ DATE: _____

INSTRUCTION TO CANDIDATES: Answer ALL questions from Section A and any other TWO from Section B:

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE (30 MARKS)

- a) Describe four distinctions between human power and mechanical power used in the farm. _____ (4 marks)
- b) Define the following terms as used in a diesel engine of a farm tractor.
- i. Detonation _____ (2 marks)
- ii. Pre-ignition _____ (2 marks)
- c) Discuss two conditions that are essential for efficient operation of fuel system _____ (4 marks)
- d) Explain the following terms in relation to diesel engine.
- i. Turbocharger _____ (3 marks)
- ii. Governor _____ (3 marks)
- e) i) _____ Describe the working of an IC engine. (6 marks)
- ii) _____ Describe four functions of a Cooling system in an IC engine. (4 marks)
- f) Explain the function of a clutch in a diesel engine of a tractor in relation to power transmission. _____ (2 marks)

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SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

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QUESTION TWO (20 MARKS)

- a) Explain the functional importance of the following in relation to power transfer in an I.C. diesel engine.
- i. Differential _____ (5 marks)
- ii. Final drive _____ (5 marks)

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- b) Describe the differences between the working of PTO and draw bar hitching implements. _____ (10 marks)

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QUESTION THREE (20 MARKS)

- a) Describe the working of I.C diesel engine of a tractor. _____ (10 marks)
- b) With aid of a flow diagram, describe the process of transmission of power in an IC. Engine. _____ (10 marks)

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QUESTION FOUR (20 MARKS)

- a) With aid of sketches, discuss the working of a two Stroke Cycle Engine of a mower. _____ (8 marks)
- b) A Four cylinder four stroke diesel engine has a cylinder diameter of 20 cm, stroke-bore ratio is 1.45, clearance volume 4508 cm^3 , engine speed 250 rpm, mean effective pressure 6.8 kg/cm^2 and mechanical efficiency is 75%. Calculate

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- (i) Indicated Horse Power _____ (3 marks)
- (ii) Brake Horse Power _____ (3 marks)
- (iii) Compression ratio _____ (3 marks)
- (iv) Swept Volume. _____ (3 marks)

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QUESTION FIVE (20 MARKS)

- a) Assume you have been contacted to educate the local farmers on tractor operation, service and maintenance. Explain this operations, service and maintenance for effective and efficient operation of their machines. _____ (10 marks)
- b) Explain three types of lubrications a farmer uses to maintain optimum working of a tractor. _____ (10 marks)

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