



**UNIVERSITY OF SWAZILAND
SUPPLEMENTARY EXAMINATION PAPER**

COURSE CODE: LUM 201

TITLE OF PAPER: - FARM POWER

BSc. AGRICULTURE YEAR 2

BSc. AGRICULTURAL EDUCATION YEAR 2

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO
OTHER QUESTIONS.**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN
GRANTED BY THE CHIEF INVIGILATOR**

SECTION ONE: COMPULSORY

QUESTION ONE

- (a) Describe the sequence of events that take place in a two-stroke internal combustion engine when the piston moves from the bottom dead centre (BDC) to the top dead centre (TDC) of the cylinder (20 marks)
- (b) What are the functions of turbochargers and intercoolers in diesel engines? (5 Marks)
- (c) Describe the operation of the engine timing system. (5 marks)
- (d) The High Veld Region of Swaziland lies between 900 to 1400 m above sea level. What are the likely problems faced in using tractors in this region and how can that be solved? (5 marks)
- (e) The following information is written on a tractor tyre; **16.9-34 10 PR**. What does this inscription mean? (5 Marks)

SECTION II: ANSWER ANY TWO QUESTIONS

QUESTION TWO

- (a) List five (5) functions of a lubricant in an engine. (10 Marks)
- (b) If the needle of the engine temperature gauge points to red which is a sign of engine overheating, state five (5) fault finding checks that you will carry out. (10 Marks)
- (c) Write short notes on diesel engine air locks (10 Marks)

QUESTION THREE

- (a) Write notes on tractors that are classified as four-wheel drives. (5 marks)
- (b) What are the functions of a tractor differential? (5 Marks)
- (c) A stationary four cylinder four –stroke engine has a cylinder of 250 mm in diameter, 500 mm stroke, compression ratio of 16:1 and runs at 154 revolutions per minute (rpm).
- (i) How many times does the engine fire (go on power stroke) in a minute?
 - (ii) If the distance moved by the piston between the top dead centre (TDC) and the bottom dead centre (BDC) is 500 mm, calculate the distance travelled by the piston in a minute.
 - (iii) What is the piston speed in metres per minute?
 - (iv) Calculate the stroke bore ratio
 - (v) Clearance volume (20 marks)

QUESTION FOUR

- (a) Why is operation of tractors at smallholder farmer level not as efficient as at large scale commercial estates? (5 marks)
- (b) Name any five internal parts of an internal combustion engine and explain their functions (10 marks)
- (c) Describe the operation of the engine timing system. (5 marks)
- (d) Write short notes on diesel engine air locks (10 marks)