



**UNIVERSITY OF SWAZILAND  
RESIT EXAMINATION PAPER**

**PROGRAMME: BSC AGRON. II  
BSC AGRIC EXT. II  
BSC ANI. SC. II  
BSC ANI. SC. (DAIRY) II**

**COURSE CODE: ABE208**

**TITLE OF PAPER: PRINCIPLES OF FARM MECHANISATION**

**TIME ALLOWED: TWO (2) HOURS**

**SPECIAL MATERIAL REQUIRED: NONE**

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

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GRANTED BY THE CHIEF INVIGILATOR**

## SECTION I COMPULSORY

## QUESTION 1

- a) Distinguish between stationary and tractive farm tasks. [6 marks]
- b) Give any three examples each of stationary and tractive farm tasks. [6 marks]
- c) Figure 1 shows an interaction between the human being, the implement and the animal during tillage.

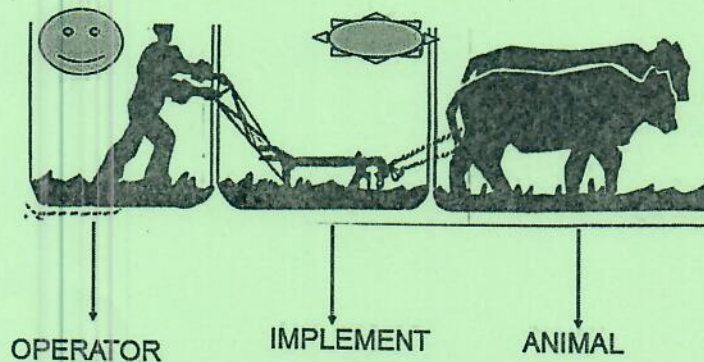


Figure 1 Human control of animal-implement interaction

- (i) Specify the roles played by the human, plough and animals. [6 marks]
- (ii) What is Draught Animal Power (DAP)? [4 marks]
- (iii) State, giving reasons for your choice, the animal breed that is suitable for Swaziland [6 marks]
- (iv) Distinguish between elimination and judging as steps used to select animals for draught power. [6 marks]
- (v) What are the six major characteristics used during the elimination step of selection of draught animal power? [6 marks]

## SECTION II – ANSWER ANY TWO QUESTIONS

## QUESTION 2

- a) What are the common tillage processes that take place during conventional tillage? [5 marks]
- b) Name the functions of the following parts of a mouldboard plough
- Share [4 marks]
  - Shin [2 marks]
  - Mouldboard [6 marks]
  - Landside [2 marks]
  - Standard [2 marks]
- c) Distinguish between broadcasting, seed drilling and precision planting of seeds. [9 marks]

## QUESTION 3

- a) Discuss the different methods of ploughing [9 marks]
- b) Distinguish between 'back furrow' and 'dead furrow' that are created during ploughing. [6 marks]
- c) Figure 2 shows a dashboard indicator symbols for a John Deere tractor. Name the labelled indicators. [10 marks]

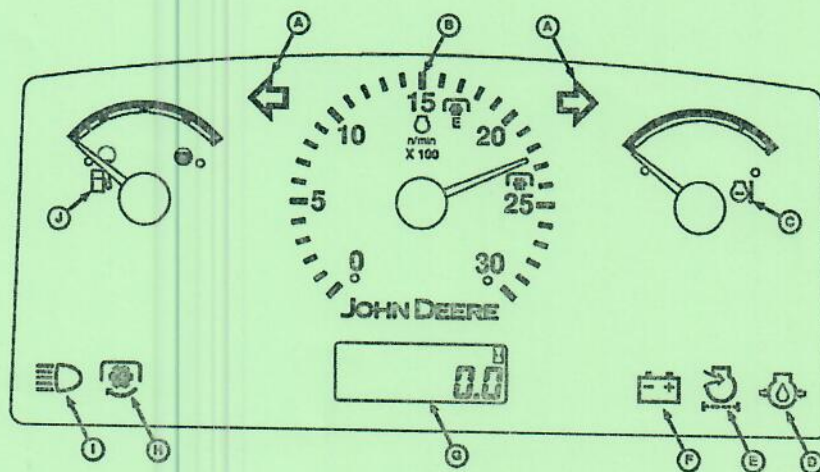


Figure 2 Dashboard indicators of John Deere tractor

- d) State any five prestart checks you would conduct on a farm tractor. [5 marks]

QUESTION 4

- a) Both the car jack and pipe wrench in Figure 3 transform rotary motion into linear motion using nut and screw components. State the driving and driven components in each of the two tools. [8 marks]

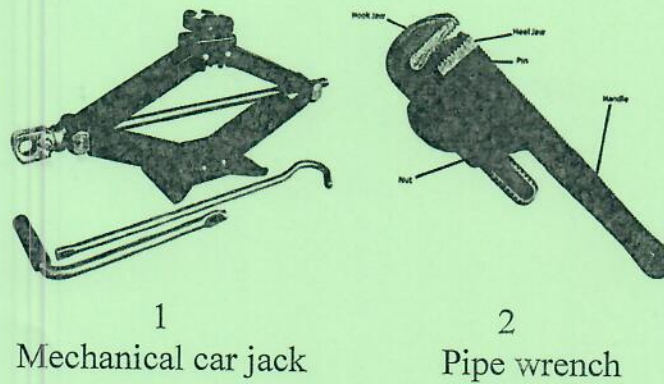


Figure 3 two common tools used to transform motion.

- b) Figure 4 shows three common types of gears used in farming machines. Name the gears [6 marks]

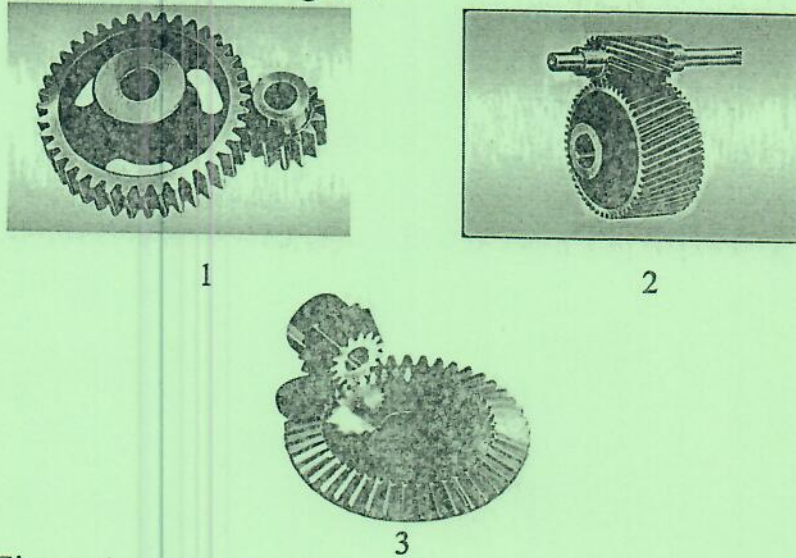


Figure 4 Types of gears

- c) Figure 5 shows a gear train in a gearbox of a forage harvester.
- Define the expression gear ratio. [4 marks]
  - Determine the gear ratio between input shaft A and output shaft D [6 marks]
  - Calculate the speed of the output shaft D (rpm) if the input shaft A rotates at 1500 rpm. [6 marks]

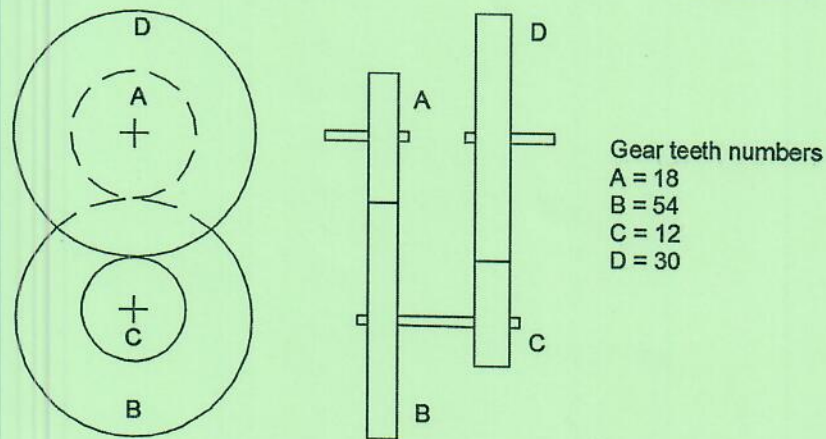


Figure 5 Gear train of a tractor gearbox