



**UNIVERSITY OF SWAZILAND
RESIT EXAMINATION PAPER**

PROGRAMME: BSC ABE. II

COURSE CODE: ABE205

TITLE OF PAPER: FARM POWER

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

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


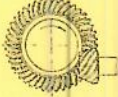



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SECTION I COMPULSORY

QUESTION 1

- a) Table 1 shows common transmission elements one can find on a farm tractor. Name the elements and give one example of a component on a tractor where you have seen each of them. [10 marks]

Table 1 transmission elements used in agricultural machinery.

	Drive	Name	Example of application
1			
2			
3			
4			
5			

- b) Figure 1 show hitching components of a farm tractor. Name the elements labelled in the figure. [12 marks]

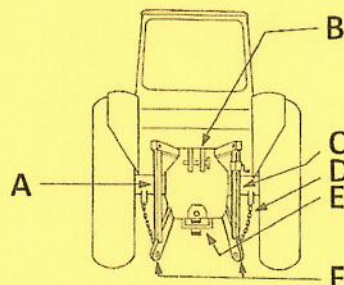


Figure 1 Hitching components of a wheeled tractor.

- c) Briefly explain the prestart checks you would conduct on a tractor in the morning before setting out of the farm yard. [9 marks]
- d) Distinguish between two wheel drive, front wheel assist, and four wheel drive tractors. [9 marks]

SECTION II ANSWER ANY TWO QUESTIONS

QUESTION 2

- a) Discuss the preference of diesel engines to petrol engines in agricultural tractors. [10 marks]
- b) A farmer consults an extension officer for advice on the choice of tractor that would be suitable on land that is marshy and predominantly clay.
- What type of tractor(s) is most suitable? [4 marks]
 - Give reasons for the choice of tractor in i) above. [6 marks]
- c) Discuss the preference of small to medium two wheel drive tractors by farmers on Swazi Nation Land (SNL). [10 marks]

QUESTION 3

- a) What role does a gearbox transmission achieve in tractor operation? [6 marks]
- b) Figure 3 shows a two stage gear reduction system for a forage harvester.

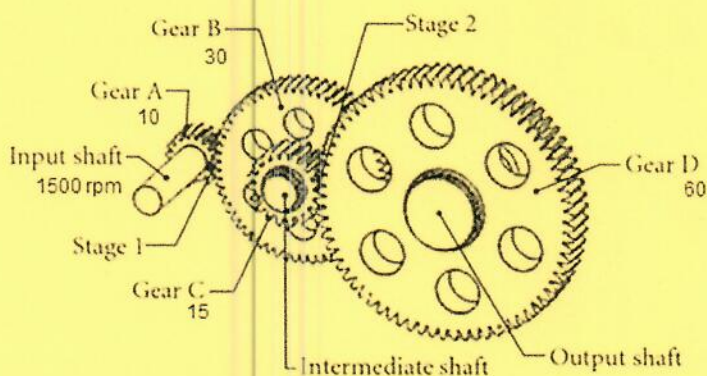


Figure 3 A two stage gearbox

- (i) Determine the speed of the intermediate shaft. [4 marks]
 - (ii) What is the gear ratio of the gearbox? [6 marks]
 - (iii) What is the speed of the output shaft? [4 marks]
- c) Discuss the advantages and limitations of using belt drives over chain drives in agricultural operations. [10 marks]

QUESTION 4

- a) Explain the presence of big deep lugs on rear tyres of two wheel drive tractors. [6 marks]
- b) Why is it necessary to sometimes fill tractor tyres with water? [6 marks]
- c) The sidewall of a tractor tyre has the inscription **235/75 R 15 10 PR**.
i. What do the following inscriptions mean?
- 1. 235 [2 marks]
 - 2. R [2 marks]
 - 3. 15 [2 marks]
 - 4. 10 PR [2 marks]
 - 5.
- d) A container of engine oil has the inscription SAE10W40. A petrol attendant explains that that it contains multigrade oil. Explain the meaning of the following:
- i. Viscosity of engine oil [5 marks]
 - ii. Multigrade engine oil. [5 marks]