



**UNIVERSITY OF SWAZILAND
SUPPLEMENTARY EXAMINATION PAPER**

**PROGRAMME: BSC AGRIC ECON. AGBMGT. II
BSC AGRIC EDUC. II
BSC AGRIC AGRON. II
BSC ANI. SC. II
BSC ANI. SC. (DAIRY) II
BSC HORT. II**

COURSE CODE: ABE 210

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) Traditionally, farmers in the southern African region have used solar energy as a source of energy. List the agricultural processes for which solar energy commonly used Swaziland. [10 marks]
- a) Distinguish between implements, equipment and machines as used in farm mechanization terminology. [12 marks]
- b) A three bottom plough is to be attached to a tractor before setting out to the field. The width of cut per bottom is 45 cm.
- (i) Calculate the total width of cut? [3 marks]
- (ii) Calculate the centre of load from the ploughed furrow [10 marks]
- (iii) What is the importance of aligning the centre of load to the centre of pull? [5 marks]

SECTION II – ANSWER ANY TWO QUESTIONS

QUESTION 2

- a) Briefly outline the operations involved in conventional tillage. [10 marks]
- b) Name any five objectives of tillage. [10 marks]
- c) Discuss the advantages of using disc ploughs in the southern African region. [10 marks]

QUESTION 3

- a) Explain
- (i) The major objectives of plant protection; [6 marks]
- (ii) The pros and cons of Ultra Low Volume (ULV) sprayers in Swaziland; [9 marks]
- b) Determine the application rate (in litres per hectare) of a boom sprayer that has a nozzle spacing of 50 cm on an 18 m boom. The sprayer is being driven at 8 kph and the nozzle discharge is 2.23 ml per second. [15 marks]

QUESTION 4

- a) A single planter drops seeds at 200 points in a row of 50 m. Calculate the plant population if a row spacing of 90 cm is expected. [6 marks]
- b) Distinguish between grain harvesting and forage harvesting? [6 marks]
- c) Figure 1 shows a harvesting machine.
1. Name the farm machine. [3 marks]
 2. What type of crop can the machine harvest? [3 marks]

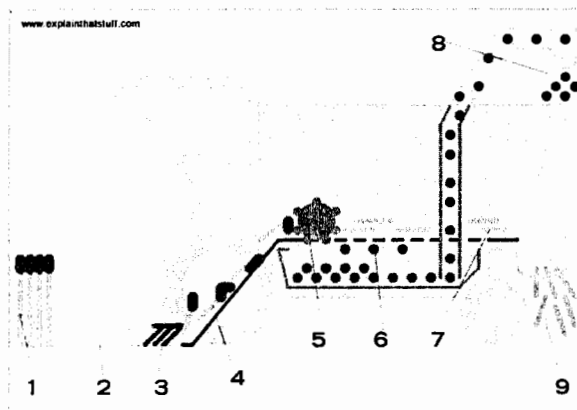
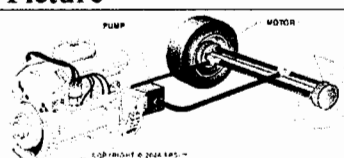
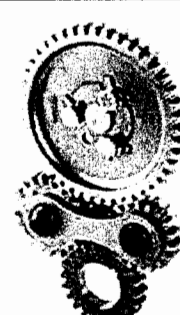
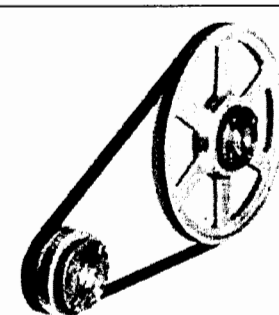


Figure 1 A farm machine for harvesting.

- d) Figure two shows a combination of power transmission equipment commonly used in farm equipment.
- (i) Name the equipment. [4 marks]
 - (ii) Give one advantage and one disadvantage of each transmission element. [8 marks]

Table 1 common agricultural power transmission components

	Picture	component name	Advantage	Disadvantage
0		Hydrostatic power transmitters	compact	expensive
1				
2				
3	