



**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.**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN  
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 processes for which solar energy has been used in agriculture in any country of your choice  
[10 marks]
- b) Distinguish between the four common primary tillage implements used in land preparation in the southern African region. [12 marks]
- c) 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) Explain the importance of knowing the centre of load on an implement?  
[8 marks]
- (ii) Determine the position of the centre of load on plough from the previously ploughed furrow wall.  
[10 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 arid and semi-arid areas of tropical and subtropical regions of Africa?  
[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 nozzle flow rate of a sprayer that is driven at 8 kmph and has a nozzle spacing of 50 cm on a 18 m boom. The desired application rate is 280l/ha. [15 marks]

**QUESTION 4**

- a) Discuss the measures that can be taken to reduce spray drift when using conventional boom sprayers. [10 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 0.02 ml per second. [8 marks]
- c) Compare and contrast the use of ULV (Ultra Low Volume) sprayers to conventional knapsack sprayers in small scale agriculture [12 marks]