



**UNIVERSITY OF SWAZILAND
MAIN EXAMINATION PAPER**

**PROGRAMME: BSC IN AGRICULTURAL & BIOSYSTEMS
ENGINEERING**

COURSE CODE: ABE 401

TITLE OF PAPER: LAND EVALUATION AND PLANNING

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

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

SECTION I: COMPULSORY QUESTION**Question One**

- a. Explain the meaning following components of the land capability and suitability classification structures: Give examples where possible.
- Land capability subclass /3 marks
 - Land suitability order /2marks
 - Land suitability class /3 marks
- 8 marks**
- b. Based on the available data on land characteristics give land capability subclasses and suitability classification for maize production for the five land parcels on Table 1. (The crop requirements include; soil pH range 5.5 – 6.5; well drained soils; rooting depth 35cm).
- 20 marks**
- c. Where land is not suitable for maize production indicate the limiting factors and recommend corrective measures if possible.
- 12 marks**

Table 1 Land Parcels

LAND CHARACTERISTICS	LAND PARCELS				
	A	B	C	D	E
SOIL DEPTH (CM)	50	40	85	100	30
SLOPE (%)	8	39	4	1	5
EROSION PROBLEMS	Moderate	Severe	Slight	None	None
WETNESS PROBLEMS	None	Moderate	Slight	None	Severe
SOIL PH	Slightly acid	Medium acid	Neutral	Slightly acid	Medium acid
CAPABILITY SUBCLASS					
SUITABILITY FOR MAIZE					

[40 marks]

SECTION II: ANSWER ANY TWO QUESTIONS FROM THIS SECTION

Question Two

- a. Using examples, explain what is the difference between major and minor land improvements?
10 marks
- b. Describe two factors that should be considered when undertaking a social impact analysis of land use.
10 marks
- c. Organizing the work plan is one of the major steps in developing a land use plan. Explain why it is important citing some of the tasks that should be accomplished at this point.
10 marks

[30 marks]

Question Three

- a. Explain what a cost benefit ratio is and why it is important in a land use appraisal process?
5 marks
- b. Describe the possible positive and negative impacts that could be identified when carrying out an Environmental Impact assessment for a dam construction.
10 marks
- c. Using examples, explain how an Environmental Impact Assessment (EIA) and a Strategic Environmental Assessment are important components of land use planning?
15 marks

[30 marks]

Question Four

- a. Explain the meaning of the following terms and describe the importance of each in a land evaluation exercise:

- i. Land characteristic /5marks
- ii. Land mapping unit /5marks
- iii. Land improvement /5marks
- iv. Land quality /5marks

20 marks

- b. Describe at least two different scales at which land evaluation maybe conducted.

10 marks

[30 marks]

LAND CAPABILITY CLASSIFICATION TABLE

Land-Characteristics	LIMITS									
	<2	<4	<7	<14	Any	<29	<39	>39		
Slope-(%)	<2	<4	<7	<14	Any	<29	<39	>39		
Soil-Depth-(cm)	>90	>50	>50	>25	Any	Any	Any	Any		
Wetness-problems	W0	W0	W1	W2	W3	Any	Any	Any		
Permeability-of-soil	4	4	2,3,4,5	2,3,4,5,6	1,2	Any	Any	Any		
Past-erosion-problems	1	1	2	2	Any	3	4	4		
Land-capability-Class	I	II	III	IV	V	VI	VII	VIII		