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1st SEM.2017/18

UNIVERSITY OF ESWATINI
FINAL EXAMINATION PAPER

PROGRAMME; BSc. AGRICULTURAL AND BIOSYSTEMS ENGINEERING
LEVEL 3

COURSE CODE: ABE305

TITLE OF PAPER: INTEGRATED LAND AND WATER MANAGEMENT

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER QUESTIONS

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QUESTION 1: COMPULSORY QUESTION

a) Determine the width of a grass strip that is desired for land with a slope of 5%.

(15 marks)

b) Determine the value of a farm that is 50 ha on the basis of land capability classification. The land capability classes for the farm are as follows:

(15 marks)

Land Capability Class	Area	Unit price (E/ha)
I	6	75000
II	14	50000
III	0	30000
IV	10	15000
V	4	5000
VI	2	10000
VI	14	6000
Total	50	-

c) Discuss five water resources for which it is essential to take an inventory in order to plan and conserve the resources.

(10 marks)

Total = 40 marks

QUESTION 2

a) Discuss the following levels of intensity as used in land evaluation, highlighting the appropriate mapping scale for each in this country.

i. Reconnaissance level

(10 marks)

ii. Semi-detailed level

(10 marks)

b) Discuss five land resources attributes for which inventory is necessary in order to make decision on land use.

(10 marks)

Total = 30 marks

QUESTION 3

a) Determine the desired vertical in height (VI) for a channel terrace for land with slope of 15% using the South Africa equation. Make your own appropriate assumptions for the other parameters required, and state your assumptions.
(15 marks)

b) Discuss five crop management strategies that can be used as soil conservation strategies.
(15 marks)

Total = 30 marks

QUESTION 4

a) Using the Rational method, determine the expected runoff from rainstorm with rainfall intensity of 50 mm/hr, catchment area of 500 ha, and runoff coefficient of 0.60.
(15 marks)

b) Discuss five factors that are considered in land capability classification. (15 marks)

Total = 30 marks