

AFRICA
UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES

AEC 301 Farm Management

END OF SECOND SEMESTER EXAMINATIONS

November 2019

LECTURER: Mr Larry Kies

DURATION: 3 HOURS

INSTRUCTIONS

1. Do not write your name on the answer sheet

2. Use Answer Sheets Provided

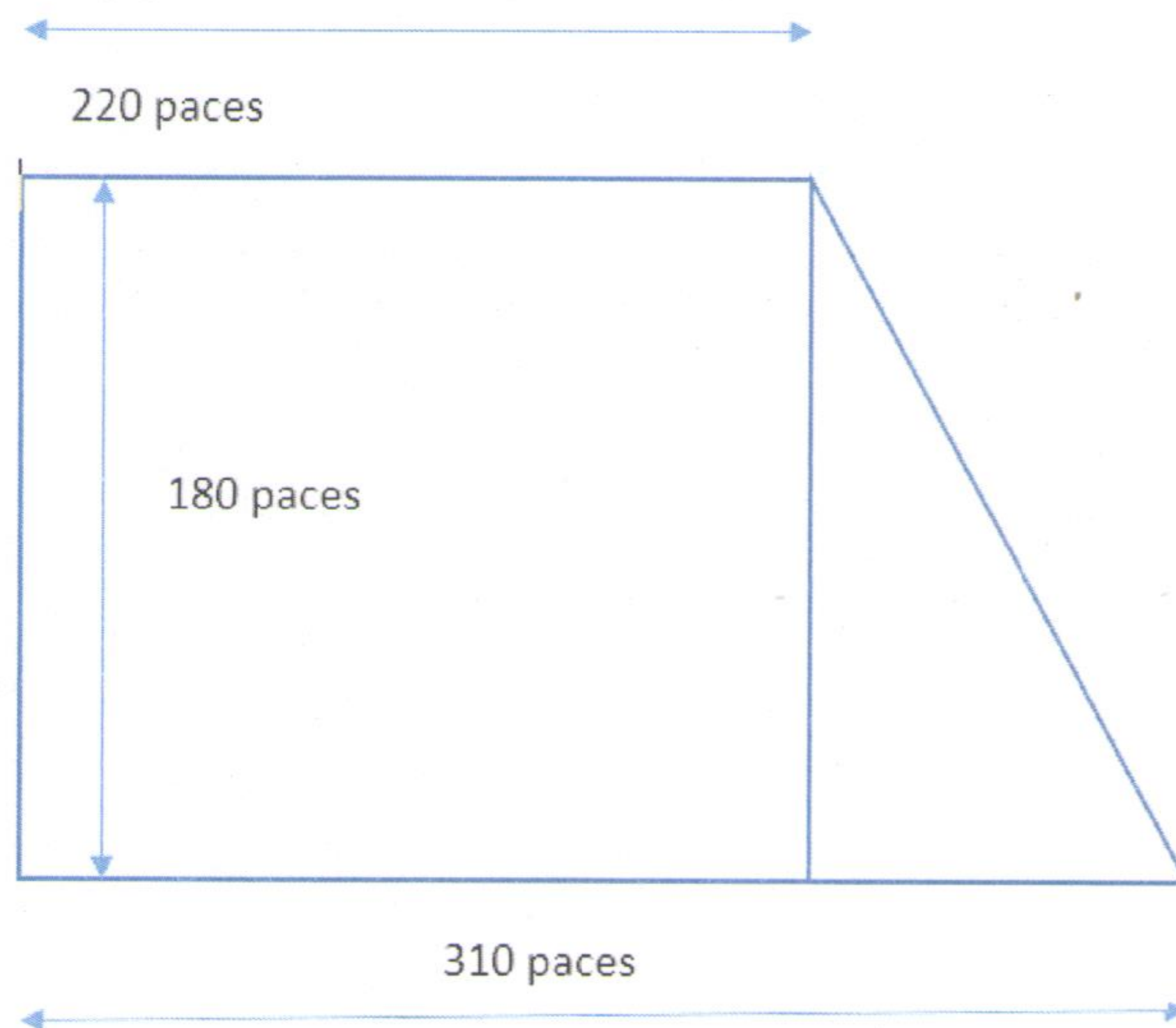
3. Begin your answer for Each Question on a New Page

4. Credit is Given for Neat Presentation

Answer ALL questions in Part I and TWO questions from Part II. If calculations are involved, show all work and indicate your answer clearly.

PART I.

1. a. Give three reasons why it is helpful for a farmer to know the areas of her fields. (3 marks)
- b. Vanessa measured the field below by pacing. She took 61 paces to walk 50m. What is the area of the field, in m^2 and *estimated* in hectares? (3 marks)



- c. Give three disadvantages of buying agricultural inputs in quantities that are more than what is needed at the time. (3 marks)
2. A farm has a farm manager, and four enterprises (fish, layers, beef and goats). All four enterprises have 5 workers each. There are 3 supervisors: one each for fish and layers, and one who does both beef and goats.
 - a. Draw a diagram illustrating an appropriate hierarchy of authority (organizational chart) for this farm. (3 marks)
 - b. Explain briefly the difference between farms in Zimbabwe that must pay Agro wages and those that can pay General Agriculture wages, and how that affects the minimum wages for each type of farm. (2 marks)
 - c. Give the name of the Crops Supervisor at Africa University Farm. (1 mark)

3. Answer the following questions using the following feed prices, feed conversion ratios, and dressing percentages.

PRODUCT	\$/50 kg bag, including transport	
Beef Pen Feeding Meal	48.00	
Layers mash	120.00	
Pig Grower/Finisher Meal (PGF)	116.00	
Mixture of concentrate:maize		
1:4 Beef Concentrate (1:4 BC)	50.00	1:4
Pig Grower/Finisher Concentrate (PGFC)	160.00	2:3
Maize	40.00	

Livestock class	Feed conversion ratio	Dressing percentage
Pigs- 10-12 kg	2.1	65
20-50 kg	2.7	70
50-110 kg	3.8	72
Beef feeder cattle	10	50

What is the feed cost for producing one kg of meat, for the following?

(4 marks)

Feed cost per kg of meat	Class of animal	Type of feed
a.	beef steer	pen feeding meal
b.	30 kg pig	PGFC + maize

c. A farmer can sell his pigs to a local butcher for \$10.00/kg of meat. Based on these prices, will his piggery be profitable? Justify your answer. (2 marks)

d. A layers flock was producing at 60% laying percentage. What was the feed cost per dozen eggs, assuming 120 g of feed per bird? (2 marks)

4. The table below lists a number of enterprises in the first column. In the second column are terms in farm management. Give a *specific example* of each term from the enterprise listed in the 1st column. (5 marks)

broilers	Non-current asset	a.
wheat	Current asset	b.
pigs	Variable cost	c.
wheat	Fixed cost	d.
dairy	Variable cost	e.

f. Explain briefly the principle of economy of scale using pigs as an example. (2 marks)

5. Ruvimbo planted maize in her field of 24 hectares.

Before harvesting, she estimated the yield by taking a sample from a plot of 10 m². She harvested 5.6 kg of maize grain from the plot.

a. How many empty 50-kg bags does she need to buy to store her maize? (2 marks)

- b. Ruvimbo borrowed \$5 000 for inputs, at an interest rate of 2% per month, compounded *monthly*. She repaid the loan after 6 months. How much did she pay in *interest* for the loan? (2 marks)
- c. Give the approximate length of time, in *years*, that it will take money to double at the following interest rates:
- 12% per *year*
 - 30% per *year*
- (2 marks)

6. A farmer named Blayne had a mixed farm. The maize and soyabeans were used mainly for feeding the chickens on the farm.

At the beginning of the year Blayne had \$20 000 in liabilities, and \$80 000 in assets.

For the year 2017, the total variable costs and returns for the different enterprises were as follows:

	Total Variable Costs, \$	Returns, \$	Overhead	Total costs, \$	<u>Returns</u> TVC	Profit after overhead, \$
maize	35,000	65,000				
soyabeans	42,000	72,000			w.	x.
broilers	37,000	45,000				
layers	52,000	49,000			y.	z.
TOTAL	166,000	231,000	28,000			

- Give the values of **w**, **x**, **y**, and **z** in the table above. (4 marks)
- Comment on the financial viability of the soyabeans enterprise, giving reasons for your answers. (2 marks)
- Comment on whether the proportion of overhead costs to variable costs is acceptable. (1 mark)
- What was his net worth at the beginning of the year? (1 mark)
- Calculate his profit (after considering overhead costs) as a percentage of beginning-of-year equity. (2 marks)

7. Marginal analysis.

Input of N (kg/Ha)	TPP of soyabean t/Ha	Total value of product \$	Total Input Cost \$	Net Return above Input Cost \$	Marginal Physical Product	Marginal Value of Product \$	Marginal Input Cost \$
0	2.0	600	0	600			
					0.8	240	40
10	2.8	840	40	800			
					0.7	210	40
20	3.5	1,050	80	970			
					0.7	210	40
30	4.2	1,260	120	1,140			
					0.3	90	40
40	4.5	1,350	160	1,190			
					0.2	60	40
50	4.7	1,410	200	1,210			
					0.1	30	40
60	4.8	1,440	240	1,200			
					-0.1	-30	40
70	4.7	1,410	280	1,130			
Based on soyabean price of \$___ per tonne				300			
Based on nitrogen price of \$___ per kg				4			
TPP- total physical product							

Answer the following according to the table above. Ignore all other costs.

(3 marks)

- At what rate of nitrogen application does maximum soyabean production occur?
- What is the rate of nitrogen application for maximum profit?
- What is the optimum rate of nitrogen application if the price of nitrogen increases to \$7/kg?

8. a. Fill in the missing steps in the decision-making process.

(2 marks)

- Define the problem.
- Elicit/obtain information about the problem
-
- Identify the best alternative
- Do it! (Carry out the decision)
-

b. When planning, objectives are supposed to be SMART. Four of the characteristics of SMART objectives are that they are Specific, Measurable, Achievable and Realistic. State what the other characteristic is, and give an example from a commercial pig farm. (2 marks)

c. There are four basic factors of production in agriculture. One is labour; another is management. What are the other two?

(2 marks)

PART II. Answer TWO questions only from this section.

9. Rodgers decided to move to Tanzania, where he will start farming in an area that already has a mixture of large and small-scale farms, but it is new to him.

Write an essay about possible sources of information that will help him in making decisions about what and how to farm in his new home. (9 marks)

10. Below is part of the summary for July for a layers enterprise with hens that have been laying for 3 months (they are 32 weeks of age).

Total birds on last day of previous month	2456
minus birds died	8
minus birds culled	0
Total birds on last day of this month	a.

Total eggs produced	32 715
Average number of birds present per day	b.
Days in month	31
Total hen-days	c.
Average Daily Laying Percentage	d.

- Calculate the value of 'a'. (1 mark)
- Calculate the value of 'b'. (1 mark)
- Calculate the value of 'c'. (1 mark)
- Calculate the value of 'd' and comment on it. If it is lower than normal, give one possible reason why. (3 marks)
- Estimate the number of bags (50 kg) of layers mash needed for the month. (1 mark)
- Comment on the number of birds that died. (2 marks)

11. Ben owns a broiler project named Ben's Birds. He has asked you to help him organize the following data from his farm into meaningful information.

	1/1/2017, values in \$	12/31/2017, values in \$
Total farm liabilities	4,500	4,400
Total farm assets, market value	12,000	17,400
Accounts payable Balances		
National Foods	360	600
Mutare Farm Supplies	120	100
Accounts receivable balances		
TM Butchery	120	145
Kanyenze Shop	150	65
Inventory of broiler concentrate	140	115
Inventory of live chickens	1,400	1,200
Inventory of frozen chickens	150	550
Cash farm receipts		23,470
Cash farm expenses, including interest on debt		17,580
Building and equipment depreciation		285

Assume all other values are 0 or irrelevant, and that there is no inflation.

- Copy the table below and use it to construct a Profit/Loss Statement of Ben's farm for 2017. (6 marks)
- Assume 12% return on beginning of year equity. What was his return on labour and management? (3 marks)

Cash Receipts		
Change in Inventory (livestock and crops)		
Change in Accounts Receivable		
Total Accrual Receipts (TAR)		
Cash Expenses		
Change in Accounts Payable		
Change in Inventory (cash expense items on hand)		
Depreciation		
Total Accrual Expenses (TAE)		
	TAR- TAE =	
	Net Farm Income =	