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UNIVERSITY OF eSWATINI

1st SEM. 2019/2020

FINAL EXAMINATION PAPER

PROGRAMME: B.Sc. ANIMAL SCIENCE YEAR 3
B.Sc. ANIMAL SCIENCE (DAIRY) YEAR 3

COURSE CODE: ASC305

TITLE OF PAPER: RESEARCH METHODS

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS

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QUESTION 1

a) Compare and contrast fundamental and applied research. Use examples to illustrate your answer. **(15 Marks)**

b) Write brief notes on three reasons for carrying out research. **(10 Marks)**

QUESTION 2

a) Briefly discuss the first four steps of the scientific method. **(10 Marks)**

b) Discuss the characteristics of a good research problem statement. **(15 Marks)**

QUESTION 3

Briefly discuss four types of sampling techniques under probability sampling. **(25 Marks)**

QUESTION 4

(a) The Animal Science Club wants to estimate the proportion of students that have a dog as a pet. If the club wanted the estimate to be within 3% of the population proportion, how many students would they need to contact? Assume a 95% level of confidence and the club estimated that 30% of the students own a dog as a pet. **(10 Marks)**

(b) To estimate the mean goat weights in a population with an accuracy of 100g per goat, using a 99% confidence interval and assuming that the standard deviation of live-weight of goats in the population of interest is 300g. What is the required sample size? **(5 Marks)**

(c) A random sample of 81 workers at a company showed that they work an average of 100 hours per month with a standard deviation of 27 hours. At 90% confidence, how many more workers need to be included in the sample to provide a confidence interval with length 4 (i.e., the margin of error being 2)? **(10 Marks)**

QUESTION 5

A Uneswa student is interested in evaluating the effect of adding yeast to goat feed on milk fat content. The researcher would have preferred to carry out the study using goats of one breed but this was not possible since only 9 goats of different breeds are available as follows: three Small East African (SEA), three Angora and three Saanen. Within each breed, 3 goats were randomly allocated to each of the 3 levels of yeast culture. The data obtained is presented below:

	Breed		
Levels of yeast culture	SEA	Angora	Saanen
1	5.4	4.0	2.5
2	5.6	3.9	3.1
3	6.3	4.4	3.7

i) Which experimental design was used? **(2.5 Mark)**

ii) How many treatments were there in this study? **(2.5 Mark)**

iii) Is there a blocking factor in this experiment? Explain your answer. **(5 Marks)**

The data was analysed and the output is presented below.

STATISTIX FOR WINDOWS ANOVA – BLO 4/11/2018

ANALYSIS OF VARIANCE TABLE FOR MILK FAT

SOURCE	DF	SS	MS	F	P
YEASTLEVE (A)	2	1.26000	0.63000	8.04	0.0397
GOATBREED (B)	2	11.3867	5.69333	72.68	0.0007
A*B	4	0.31333	0.07833		
TOTAL	8	12.9600			

Based on this output, answer the following questions:

iv) Are the yeast level effects (YEASTLEVE) significant? Explain how you arrived at your answer. **(5 Marks)**

v) Are the goat breed effects significant? Explain your answer. **(5 Marks)**

vi) Based on the output below, would you be in a position to identify the yeast levels that produce significantly different milk fat levels? Explain your answer. **(5 Marks)**