

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF DOCTOR  
OF PHILOSOPHY IN APPLIED MATHEMATICS**

**MATH 990: RESEARCH METHODOLOGY**

**STREAMS: PhD**

**TIME: 3 HOURS**

**DAY/DATE: TUESDAY 13/8/2019**

**8.30 A.M. – 11.30 A.M**

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**INSTRUCTIONS: Answer question ONE and any other FIVE questions**

**QUESTION ONE**

- (a) Highlight at least ten characteristics of research [5 marks]
- (b) Highlight and briefly explain 10 sources of applied mathematics research problem [5 marks]
- (c) Explain five functions of data analysis [5 marks]

**QUESTION TWO**

- (a) Highlight the main steps necessary to effectively carry out research [10 marks]
- (b) State and explain at least five purposes of a research design [5 marks]

**QUESTION THREE**

- (a) Highlight and briefly explain three importance of sampling [3 marks]
- (b) Explain briefly at least six types of variables [2 marks]
- (c) Explain the main characteristics of a good/well written objectives [5 marks]
- (d) Explain five characteristics of Good research design [5 marks]

## MATH 990

### QUESTION FOUR

- (a) Highlight five general rules that apply to all types of data collection [5 marks]
- (b) Change the following references to the APA format style [5 marks]
- (1) H. B Stenzel, Successional speciation in paleontology: The case of the oysters of the sellaeformis stock, *Evolution*, 3 (1949), 33 – 50
  - (2) J. Felsenstein, *Inferring Phylogenies*, Sinauer, Sunderland, MA, 2004
  - (3) N. Eldredge and J. Cracraft, *Phylogenetic Patterns and the Evolutionary Process*, Columbia University Press, New York, 1980
  - (4) R. D. M Page and E. C Holmes, *Molecular Evolution: A Phylogenetic Approach*, Blackwell Science, Oxford, UK, 1998
  - (5) L. Pachter and B. Sturmfels, *Algebraic Statistics for computational Biology*, Cambridge University Press, Cambridge, UK, 2005
  - (6) C. Zimmer, What is a species?, *Sci. Amer.*, 298-6 (2008), 72-79
- (c) Explain the main parts of a good abstract [5 marks]

### QUESTION FIVE

- (a) Highlight ten steps of experimental research methods [5 marks]
- (b) Highlight at least five referencing styles [5 marks]
- (c) Highlight five types of Research on the basis of method of research [5 marks]
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