



UNIVERSITY OF ESWATINI
Faculty of Health Sciences
Department of Environmental Health Science

B.Sc. DEGREE IN ENVIRONMENTAL HEALTH SCIENCE

MAIN EXAMINATION PAPER DECEMBER 2018

TITLE OF PAPER : RESEARCH METHODS

COURSE CODE : EHS 309

DURATION : 2 HOURS

MARKS : 100

INSTRUCTIONS : READ THE QUESTIONS & INSTRUCTIONS CAREFULLY

: ANSWER ANY FOUR QUESTIONS

: EACH QUESTION **CARRIES 25** MARKS.

: WRITE NEATLY & CLEARLY

: NO PAPER SHOULD BE BROUGHT INTO THE EXAMINATION ROOM.

: BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.

QUESTION ONE (25 marks total and 5 marks for each question)

- 1A. What are the six ethical principles that must be followed in research?
- 1B. Discuss the steps involved in stakeholder analysis of ethics in research.
- 1C. What are the three types of errors that may arise in the course of collecting data using rating scales?
- 1D. How do you compare cohort studies and case control studies in terms of the number of samples/subjects to be included in the study?
- 1E. Describe the before-and-after with control design as part of experimental research setup.

QUESTION TWO (25 marks total and 5 marks for each question)

- 2A. Discuss steps that may be taken to minimize non response bias in research survey.
- 2B. List and define the possible threats to internal validity that may arise in quantitative research.
- 2C. List and define the two types of criterion related validity.
- 2D. List and define the different types of triangulation used in research.
- 2E. List and define the four different tests of reliability.

QUESTION THREE (25 marks total and 5 marks for each question)

- 3A.** Why would adoption of feminist perspective be useful in water supply and sanitation research?
- 3B.** Why would a grounded theory be appropriate for research studies dealing, for example, with climate change?
- 3C.** Classify the approach (positivist , phenomenological) as well as the methodology (cross section, longitudinal, feminist perspective, survey, case study, experimental, participative inquiry, etc.) for the following research topics:
- i. The prevalence of sexual harassment in work place environment.
 - ii. The extent of occupational accidents in timber processing factories.
 - iii. The impact of pesticides on health of workers spraying the chemicals on farm lands.
 - iv. The impact of educational intervention in prevention of water borne illness among members of a community.
 - v. Knowledge attitude and practices regarding prostate cancer in a city.
- 3D.** List the advantages and disadvantages of i) mail survey and ii) group interview.
- 3E.** List and define the three types of interviews used in data collection. Discuss also their advantages and disadvantages.

QUESTION FOUR (25 marks and marks are indicated against each question)

4A. A prevalence study of a certain water borne disease in a community is to be undertaken within a given population of 6000 from which suitable sample has to be drawn. There is no previous information or data regarding the estimated prevalence of diarrhea in the region or at national level. If the confidence level chosen is 95% with 7% margin of error in the estimate of the proportion, determine the sample size required. Take z value for 95% confidence level as 1.96. Also assume that there will be 15% non-response during data collection.

.....[13 marks]

4B. An occupational health officer wishes to estimate the mean rate of accident per year in a factory with a population of workers of 3000. From previous national level studies a standard deviation of 20 accidents/per year was reported. If the researcher is willing to tolerate a marginal error of up to 4 accidents/year in his estimate, how many subjects should be included in his study? $\alpha = 5\%$ two-sided. Take the z value as 1.96 for 95% confidence level. Assume also that 10% of the subjects will fail to participate in the survey.[12 marks]

QUESTION FIVE (25 Marks and marks are indicated for each question)

5A. For the data shown in the table below, draw the stem and leaf plot. Include also the cumulative frequency in the plot.[12 marks]

0	22	35	56
4	24	38	57
5	26	47	63
6	27	48	67
10	28	48	83
15	29	49	86
16	32	54	96
17	34	54	97
22	34	55	97

5B. A research based on sampling of the preference of consumers for different types of shops gave the following results:

Soap type	Number of consumers who bought this soap
1	6
2	4
3	15
4	9

It is required to determine whether the shoppers pick the soaps by chance or whether they have a preference for a particular type of soap. Using chi square test provided below, determine if the consumers have preference for a particular type of soap at 0.05 significant level.

.....[13 marks]

χ^2 (Chi-Squared) Distribution: Critical Values of χ^2

<i>Degrees of freedom</i>	<i>Significance level</i>		
	5%	1%	0.1%
1	3.841	6.635	10.828
2	5.991	9.210	13.816
3	7.815	11.345	16.266
4	9.488	13.277	18.467
5	11.070	15.086	20.515
6	12.592	16.812	22.458
7	14.067	18.475	24.322
8	15.507	20.090	26.124
9	16.919	21.666	27.877
10	18.307	23.209	29.588