

UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

SUPPLEMENTARY EXAMINATION PAPER – JULY 2005.

- TITLE OF PAPER : RESEARCH METHODS AND STATISTICS
- COURSE CODE : HSC 301
- TIME : 3 HOURS
- MARKS : 100
- INSTRUCTIONS :
- : ANSWER SIX QUESTIONS IN ALL
 - : ANSWER FIVE QUESTIONS FROM SECTION A AND TWO QUESTIONS FROM SECTION B.
 - : NO FORM OF ANY PAPER SHOULD BE BROUGHT INTO NOR TAKEN OUT OF THE EXAMINATION ROOM
 - : ALL CALCULATIONS/WORK OUT DETAILS SHOULD BE SUBMITTED WITH YOUR ANSWER SHEET
 - : BEGIN AN ANSWER TO EACH QUESTION ON A SEPARATE SHEET OF PAPER
 - : A FORMULA SHEET AND GRAPH PAPER ARE PRIDED FOR YOU
 - : CALCULATORS MAY BE USED BUT THEY MUST BE THE SILENT TYPE

DO NOT OPEN THIS EAXAMINATIO PAPER UNTIL TOLD TO DO SO BY THE INVIGILATOR

SECTION A : HEALTH STATISTICS

PART A Answer ALL questions in this part

QUESTION 1

a. Determine whether the following variables are qualitative or quantitative:

- i. whether a homestead has a toilet or not (1)
- ii. ages of children sleeping under a bednet (1)
- iii. doing a couliform count to determine cleanliness of a water source (1)

b. Determine whether the following variables are continuous or discrete :

- i. diarrhoeal episodes (1)
- ii. skinfold thickness (1)
- iii. number of positive cases for each occupational category (1)

c. Write out the terms; $\sum_{i=1}^4 x_i/y_k$ (2)

d. Use the summation sign to write out ; (2)
 $(a_1 /b_1 - x) + (a_2 /b_2 - x) + \dots + (a_n /b_n - x)$

[10 marks]

QUESTION 2

Suppose that a simple random sample of 14 restaurants is visited and checked for the presence or absence of each of a dozen possible lapses from good hygiene practices, with the following results :

Number of lapses	Number of restaurants
0	2
1	2
2	5
3	3
4	1
5	1
6 or more	0

a. Represent this information on a bar chart. (3)

c. Use the data to calculate the:

- i. mean (2)

- ii. median (2)
- iii. mode (1)
- iv. standard deviation (2)

[10 marks]

QUESTION 3

a. Determine the following :

i. $4P_3$ (2)

ii. $\binom{7}{2}$ (2)

b. The probability is 0.6 that a patient selected at random from the current residents of a certain hospital will be a male. The probability that the patient will be a male who is in for surgery is 0.2. A patient randomly selected from current residents is found to be a male, what is the probability that the patient is in the hospital for surgery. (2)

d. In how many ways can a committee of 3 Environmental Health Officers (EHOs) and 2 Health Assistants (HAs) be formed from 12 EHOs and 6 HAs if :

i. there are no restrictions (2)

ii. one particular EHO must be in the committee and one HA must not be in the committee (2)

[10 marks]

PART B : Answer TWO questions from this section.

QUESTION 4

Thirty air samples taken at the same site over a period of six months showed the following amounts of suspended particulate matter (microorganisms per cubic metre of air):

68	22	36	32	52	61
42	24	28	38	64	48
30	44	38	27	36	57
28	43	45	50	26	60
79	74	57	31	32	60

a. Use the data to prepare :

i. a frequency distribution (3)

ii. a relative frequency distribution (2)

b. Use your frequency distribution to calculate the :

- i. mean (2)
- ii. median (2)
- iii. mode (2)
- vi. 80th percentile (2)
- v. lower quartile (2)

[15 marks]

QUESTION 5

A survey of 64 medical laboratories revealed that the mean prize charged for a certain test was E12. Given that the variance in all the laboratories in the area is E6, would you say that the data provide sufficient evidence, at the 95% confidence level, to indicate that the population mean is greater than E10?

[15 marks]

QUESTION 6

The statistics below shows the atmospheric pollution – microorganisms per cubic metre, at some chosen regions of Great Britain.

	Smoke	Sulphur Dioxide
North	13	37
Yorkshire and Humberside	23	45
North West	17	45
East Midlands	16	43
West Midlands	16	40
East Anglia	12	24
Greater London	14	42
Rest of South East	11	39
South West	8	21
Wales	11	28
Scotland	17	34

- a. Show the data on a scatter diagram. (3)
- b. Find the equation of the best fitting line through the scatter diagram and fit the line. (8)
- c. Determine the correlation coefficient of the relationship between the smoke and sulphur dioxide pollutant. Use the value of the correlation coefficient to describe the relationship between the two. (4)

[15 marks]

SECTION B: RESEARCH METHODS

QUESTION 7

20 MARKS

- A. What do you understand “research” to be (4)
- B. To what extent is “Basic research” appropriate in your field of study and why (16)

QUESTION 8

20 MARKS

- A. What criteria are used to assess the adequacy of the “**significance of a research problem**” in a proposal or research report? (4)
- B. Compare and contrast Standardised interviews and Ethnographic interviews. Tabulate your answer for clarity. (16)