UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

SUPPLEMENTARY EXAMINATION PAPER – JULY, 2012

TITLE OF PAPER	:	HEALTH STATISTICS
COURSE CODE	:	HSC 307
TIME	:	2 HOURS
MARKS	:	70

INSTRUCTIONS	:	ANSWER **ALL** QUESTIONS IN **SECTION A**
	:	EACH QUESTION IN SECTION A IS 10 MARKS
	:	ANSWER **ANY TWO** QUESTIONS FROM **SECTION B**
	:	EACH QUESTION IN SECTION B IS 20 MARKS
	:	NO FORM OF PAPER SHOULD BE BROUGHT INTO NOR TAKEN OUT OF THE EXAMINATION ROOM
	:	BEGIN THE ANSWER TO EACH QUESTION ON A SEPARATE SHEET OF PAPER
	:	**GRAPH PAPER** AND **FORMULA SHEETS** ARE PROVIDED
	:	CALCULATORS MAY BE USED BUT THEY MUST BE THE SILENT TYPE
	:	ALL CALCULATIONS/WORK-OUT DETAILS SHOULD BE SUBMITTED WITH YOUR ANSWER SHEET

SECTION A: COMPULSORY

ANSWER ALL QUESTIONS IN THIS SECTION.

QUESTION 1

a. Determine whether the variables derived from the following activities are quantitative of qualitative. (4)
   i. recording the ethnic group of a sample
   ii. writing down the heights of workers of a company
   iii. obtaining ages of males suffering from asbestosis in a community
   iv. determining whether a condom was used in the last sexual activity or not

b. State whether the following are measured on a nominal scale or ordinal scale (3)
   i. Socio-economic status
   ii. Gender
   iii. Intelligence level of students in the Environmental Health class

c. A research team is interested in the difference between serum uric acid levels in the patients with and without Down's syndrome. In a large hospital for treatment of the mentally retarded, a sample of 12 individuals with Down's syndrome yielded a mean of 4.5 mg/100ml. In a general hospital a sample of 15 normal individuals of the same age and sex were found to have a mean value of 3.4. If it is reasonable to assume that the two populations of values are normally distributed with variances equal to 1 and 1.5 respectively, find the 95 percent confidence interval for $\mu_1 - \mu_2$. (3)

[10 marks]

QUESTION 2

In a pilot study, Huizinga et al. (2003) wanted to gain more insight into the psychological consequences for children with cancer. For the study, 14 families participated in the semi-structured interviews and computed standardised questionnaires. Below is the age of the sick parents with cancer (in years) for the 14 families.

37	48	53	46	42	49	44
38	32	32	51	48	51	41

Determine the:

a. mean (2)
b. median (2)
c. mode (2)
d. variance and (2)
e. standard deviation of the ages (2)

[10 marks]

QUESTION 3

In a study of violent victimisation of women and men, Porcerelli et al (1999) collected information from 679 women and 345 men aged 18 to 64 years at several family practice centres in a metropolitan area. Patients filled out a health history questionnaire that included a question about victimisation. The following table shows the sample subjects cross-classified by sex and the type of violent victimisation reported. The victimisation categories are defined as no victimisation, partner victimisation (and not by others), victimisation by persons other than partners (friends, family members, or strangers), and those who reported multiple victimisation.

	No victimisation	Partners	Non-partners	Multiple Victimisation	Total
Women	611	34	16	18	679
Men	308	10	17	10	345
Total	919	44	33	28	1024

a. Suppose we pick a subject at random from this group:
   i. What is the probability that this subject will be a woman? (2)
   ii. What do we call this probability? (1)
b. If we pick a subject at random
   i. What is the probability that the subject will be a woman and have experienced partner abuse? (2)
   ii. What do we call this probability? (1)
c. Suppose we pick a man at random. Knowing this information, what is the probability that he experienced abuse from partners? (2)
d. Suppose we pick a subject at random. What is the probability that it is a man or someone who experienced abuse from a partner? (2)

[10 marks]

SECTION B: ANSWER ANY **TWO** QUESTIONS FROM THIS SECTION

QUESTION 4

The following are the ages of 30 patients seen in the emergency room of a hospital on a Friday night.

35	32	21	43	39	60
36	12	54	45	37	53
45	23	64	10	34	24
36	45	55	44	55	46
22	38	35	56	45	57

a. Prepare a frequency distribution and a relative frequency distribution of the ages of the patients. (4)

b. Represent this information on a polygon and write a plausible interpretation of the distribution of the ages of the patients. (4)

c. Use the data to calculate the:

i. mean (2)
iii. median (2)
iv. mode (2)
v. variance (2)
vi. standard deviation (2)
vii. 80^{th} percentile (2)

[20 marks]

QUESTION 5

The goal of a study by Klingler et al (2001) was to determine how symptom recognition and perception influence clinical presentation as a function of race. They characterised symptoms and care-seeking behaviour in African-American patients with chest pain seen in the emergency department. One of the presenting vital signs was systolic blood pressure. Among 157 African-American men, the mean systolic blood pressure was 146 mmHg with a standard deviation of 27. We wish to know if, on the basis of these data, we may conclude that the mean systolic blood pressure for a population of African-American men is greater than 140.

[20 marks]

QUESTION 6

The following scores represent a nurse's assessment (X) and a physician's assessment (Y) of the condition of 10 patients at time of admission to a trauma centre.

X	45	34	0	20	52	10	72	0	11	40
Y	49	32	0	24	47	9	75	1	10	34

a. Construct a scatter diagram for these data. (4)
b. Obtain the regression equation and plot it on the scatter diagram. (12)
c. Determine the correlation co-efficient of the relationship between the nurse's and the physician's assessment and state the relationship between the two assessments. (4)

[20 marks]