

UNIVERSITY OF SWAZILAND
FACULTY OF HEALTH SCIENCES

FINAL EXAMINATION PAPER – MAY, 2011

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

INSTRUCTIONS :

- ANSWER **ALL** QUESTIONS FROM SECTION A
- ANSWER **ANY TWO** QUESTIONS FROM SECTION B
- 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
- A **FORMULA SHEET AND GRAPH PAPER** 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

Blood samples for groupings obtained from 20 women attending an antenatal clinic are given below:

Woman	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
Blood Group	O	AB	O	A	O	B	O	A	O	A	O	A	A	O	A	O	O	A	A	B

- Is this nominal or ordinal data (1)
- Is the data qualitative or quantitative (1)
- Prepare a frequency distribution table of the blood groups of the women (3)
- Display the data in a bar chart (3)
- Write a plausible interpretation of the bar chart (2)

[10 marks]

QUESTION 2

- Suppose A and B denote two genetic characteristics. The probability is 0.5 that an individual chosen at random will exhibit A and 0.75 that he will exhibit B. Calculate the probability that an individual chosen at random will exhibit:
 - at least one (3)
 - neither (2)
 - exactly one (3)
- Display these probabilities in a pie chart. (2)

[10 marks]

QUESTION 3

Suppose an achievement test was administered to 122 students. Their mean score was 104 with standard deviation of 16. We wish to estimate mean score of the population (i.e. population parameter) from the sample statistic.

- Calculate the standard error of the mean (3)
- Construct the 95% and 99% confidence intervals for the mean score (5)
- Interpret your 95% confidence interval (2)

[10 marks]

SECTION B: ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION 4

The table below shows recorded ages at diagnosis of patients with stage I urinary schistosomiasis among workers of a company in the sugar cane industry in Swaziland during 1985 at Hospital X* (n = 80)

84	20	31	43	24	76	67	55	46	59
48	52	74	23	35	65	36	63	51	49
52	48	53	47	38	68	37	67	45	55
48	58	47	57	72	23	65	35	61	31
53	43	54	44	55	45	56	46	33	63
34	64	51	41	52	42	53	43	54	44
55	45	32	62	33	63	34	64	27	77
56	46	57	47	58	48	59	49	24	74

- a. Prepare a frequency distribution of the ages (4)
- b. Also, prepare a relative frequency distribution of the data (2)
- c. Use your frequency distribution to compute the:
- i. mean (2)
 - ii. median (2)
 - iii. mode (2)
 - iv. standard deviation (2)
 - v. Lower quartile (2)
 - vi. 60th percentile (2)
- d. Write a plausible interpretation of your answer to the mean. (2)

[20 marks]

QUESTION 5

Suppose a lecturer of a certain subject at a college wanted to establish whether there was a relationship between the marks of an essay test and a multiple choice test.

Student	A	B	C	D	E	F	G	H	I	J
Essay	40	60	80	80	100	50	40	50	30	90
Multiple-choice	70	50	80	100	90	70	40	90	60	80

Did students who obtained high marks for the essay tests also obtain high marks for multiple-choice questions and vice versa? (Hint: determine how much correlation exists between the two sets of marks).

[20 marks]

QUESTION 6

Let us suppose we have two independent samples. One is composed of 130 adults who ate chicken pie at a party the previous night. The other is composed of 781 adults who did not eat any chicken pie at the same party. Of the 130 adults who ate chicken pie, 41 were admitted to casualty with acute gastroenteritis and of the 781 who did not eat chicken pie, 85 were admitted with acute gastroenteritis. We now want to determine whether the chicken pie was a significant factor in the outbreak of gastroenteritis. (Hint: Construct a 2 x 2 table and apply the χ^2 test on it).

[20 marks]