JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY SCHOOL OF MATHEMATICAL & ACTUARIAL SCIENCE

UNIVERSITY EXAMINATION FOR THE BACHELORS DEGREE

1ST YEAR 1ST SEMESTER 2013/2014 ACADEMIC YEAR

CENTRE: MAIN

COURSE CODE: SAS 101

COURSE TITLE: DESCRIPTIVE STATISTICS

EXAM VENUE: AH **STREAM: (BSc. Actuarial, Bed, BSc)**

DATE: 15/4/2014 **EXAM SESSION: 2.00 – 4.00 PM**

TIME: 2 HOURS

Instructions:

1. **Answer ALL questions in section A and ANY other 2 questions in section B**
2. **Candidates are advised not to write on the question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

QUESTION ONE- COMPULSORY (30 MARKS)

a. State and explain clearly any three standard methods of data collection. (6 marks)

b. Consider the stem-plot below

0	5 , 6 , 7, 7, 8 , 8 ,8 , 8 , 8, 9, 9 , 9
1	0 ,1, 1 , 2 , 3 ,3 , 3, 4
1	5 ,6 ,6, 6 , 7, 7 , 7 , 7, 7 , 7 , 8 , 8 ,9
2	0 ,0, 1 , 2 , 4, 4, 4
2	5, 8, 8, 8 ,9

Key: 1/6 means 16

i. Come up with the raw data from which the stem-plot was constructed. (2 marks)

ii. By constructing a grouped frequency distribution table with class interval 5, estimate the standard deviation for the data. (6 marks)

c. Establish the known relationship between the Arithmetic mean, the Geometric mean and the Harmonic mean based on the following data.

(8 marks)

marks	20	21	22	23	24	25
No of pupils	4	2	7	1	3	1

d. The average length in centimeters of waste timber was recorded for 20 consecutive weeks as follows in a wood workshop.

week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
length	3.0	3.0	3.6	2.9	3.4	3.3	3.7	3.8	3.9	3.6	3.7	3.8	4.1	4.1	4.4	3.9	3.8	3.6	4.0	4.1

By calculating a centered 4 point moving average, estimate the trend values for the fourth, eleventh and the sixteenth weeks. (8 marks)

QUESTIONS TWO (20MARKS)

a. From the following information.

masses	0-50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	Above 400
frequency	5	14	40	91	150	87	60	38	15

i. Estimate the mode

ii. Estimate the coefficient of quartile deviation. (10 marks)

b. Two trainee marksmen recorded their points in 10 consecutive attempts. Find out which of the two is more consistent in scoring given the information below. (10 marks)

Batsman A	5	7	16	27	39	53	56	61	80	101	105
Batsman B	0	4	16	21	41	43	57	78	83	93	95

QUESTION THREE (20 MARKS)

a. Compute and explain Kelly's coefficient of skewness for the distribution given below.

. (10 marks)

marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
frequency	2	5	7	13	21	16	8	3

b. By assuming a common constant A= 70 ,compute the product moment correlation coefficient for the following data and explain its significance (10 marks)

Math	90	88	77	89	76	75	90	77	50	63	78	80
English	88	91	76	70	52	68	76	80	63	70	55	78

QUESTION FOUR (20 MARKS)

a. The following table gives the marks obtained by some students in an examination

class	35-43	45-53	55-63	65-73	75-83	85-93
frequency	13	20	35	47	5	3

i. Using the coding method, calculate the simple average and the standard deviation

ii. Estimate the quartile deviation

iii. Suppose a value 2 multiplied each of the data set, what would be the new values for parts one and two obtained above? (13 marks)

b. An experiment measuring the percent shrinkage on drying of 50 clay specimens produced the following data:

18.2	21.2	23.1	18.5	15.6	20.8	19.4	15.4	21.2	13.4
16.4	18.7	18.2	19.6	14.3	16.6	24.0	17.6	17.8	20.2
17.4	23.6	17.5	20.3	16.6	19.3	18.5	19.3	21.2	13.9
20.5	19.0	17.6	22.3	18.4	21.2	20.4	21.4	20.3	20.1
19.6	20.6	14.8	19.7	20.5	18.0	20.8	15.8	23.1	17.0

Using the formula $2^k > n$ and $= 0.1$, organize the data in to a grouped frequency distribution table. (7 marks)

QUESTION FIVE (20 MARKS)

a. Describe the nature of peakedness exhibited by the following data. (10 marks)

Height	110-120	120-130	130-140	140-150	150-160	160-170	170-180
frequency	2	3	5	6	5	3	2

b. Based on the data below, compute Fisher's ideal index number and Marshall-Edge Worth index for 1993 and 1994 using 1995 as the base year. Compare the cost of living in 1993 to 1994 based on the values obtained. (10 marks)

	1993		**1994**		**1995**	
item	**Price**	**quantity**	**Price**	**quantity**	**Price**	**quantity**
A	2	25	3	30	5	28
B	3	15	4	20	2	25
C	15	4	20	3	3	4