



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

UNIVERSITY EXAMINATION 2012/2013

**1ST YEAR 1ST SEMESTER EXAMINATION FOR THE DEGREE
OF BED (SCIENCE) AND BSC. (ACTUARIAL SCIENCE)**

(REGULAR)

COURSE CODE: SAS 101

TITLE: DESCRIPTIVE STATISTICS

DATE: 25 /4/2013

TIME: 9.00-11.00AM

DURATION: 2 HOURS

INSTRUCTIONS

- 1. This paper contains SIX (6) questions**
- 2. Answer question 1 (Compulsory) and ANY other 2 Questions**
- 3. Write all answers in the booklet provided**

QUESTION ONE- COMPULSORY (30 MARKS)

- a. Distinguish between skewness and kurtosis. (4mks)
- b. The computed arithmetic mean of 20 values is 45. If one of these values was taken as 64 instead of 46, and that a constant 10 was to be added to each of the 20 values before computing the mean, find the corrected value. (4mks)
- c. Calculate the mode given 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

(4mks)

- d. Compute Bowley's coefficient of skewness for the following data:
391,384,591,407,672,522,777,733,1490,2488 (6mks)
- e. Find out which of the following batsmen is more consistent in scoring (7mks)

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

- f. The number of deaths in a particular village between 1990-1995 was recorded as follows

year	1990	1991	1992	1993	1994	1995	1996	1997	1998
deaths	25	24	18	29	21	24	20	22	27

Obtain the smoothened values using 4-point moving averages hence estimate the trend value for 1992 and 1995 (5mks)

QUESTIONS TWO (20MARKS)

- a. Particulars regarding income of three villages are given below:

	Village		
	A	B	C
No of people	600	500	750
Average income	175	186	180
Standard deviation of income	10	9	8.5

Use this information to compute the combined mean and combined standard deviation.

(7mks)

- b. Compute Karl-Pearson's coefficient of skewness for the given distribution hence sketch a graph for skewness. (13mks)

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

QUESTION THREE (20 MARKS)

- a. i). Establish the known relationship between the Arithmetic mean, the Geometric mean and the Harmonic mean based on the following data. (9mks)

masses	20	21	22	23	24	25
containers	4	2	7	1	3	1

- ii). Explain under what special circumstances one may fail to obtain each of the three averages. (3mks)

- b. The data below represents daily profits of a supermarket

	Sun	Mon	Tue	Wed	Thu	Fri
Week 1	35	38	25	33	37	25
Week 2	34	36	23	35	31	24

- i. Using a 6-point moving averages draw a time series graph and a trend line on the same pair of axis. (6mks)
- ii. What advice in your opinion would be best for the business manager? (2mks)

QUESTION FOUR (20 MARKS)

- a. Define correlation. (2mks)
- b. Compute the rank correlation coefficient for the following data and explain its significance (8mks)

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

c. 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 was multiplied to each of the data set and then 4 was added to each results, obtain the new average and standard deviation. (10mks)

QUESTION FIVE (20 MARKS)

a. 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

- i. Draw a stem and leaf plot for these data. based on the key $13/9 \rightarrow 13.9$, $23/10 \rightarrow 24.0$ and the exclusive classes of the type $13 - 15$ (5mks)
 - ii. Identify the sample mode and write down its stem and leaf symbol (2mks)
 - iii. Estimate the 85th percentile for the sample (3mks)
- b. Based on the data below, compute Fisher’s ideal index number and Marshall-Edgeworth index for 1994 and 1995 using 1993 as the base year. Make concise comments on the cost of living in 1994 as compared to 1995 based on the values obtained. (10mks)

item	1993		1994		1995	
	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