



# TECHNICAL UNIVERSITY OF MOMBASA

## *Faculty of Business & Social Studies*

DEPARTMENT OF BUSINESS STUDIES

DEPARTMENT OF LIBERAL STUDIES

UNIVERSITY EXAMINATIONS FOR DEGREE IN  
BACHELOR OF BUSINESS ADMINISTRATION  
BACHELOR OF SCIENCE IN DEVELOPMENT STUDIES

### **HBC 2121: BUSINESS STATISTICS**

SUPPLEMENTARY/SPECIAL EXAMINATIONS

**SERIES:** FEBRUARY 2013

**TIME:** 2 HOURS

#### **INSTRUCTIONS:**

– Answer Question **ONE (Compulsory)** and any other **TWO** questions.

***This paper consists of Three printed pages***

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#### **QUESTION 1 (Compulsory)**

a) There are 150 students in a class. The distribution of their marks in a statistics test is as follows:

<b>Class</b>	<b>Frequency (f)</b>
0 – 9	3
10 – 19	10
20 – 29	17
30 – 39	X
40 – 49	35
50 – 59	Y
60 – 69	18
70 – 79	10
80 - 89	5
90 - 99	2

**Required:**

- i) Find the value of X, given that the median mark is 44.357. (5 marks)
- ii) Find the value of Y given that the modal mark is 43.0. (4 marks)
- iii) Draw a less than ogive of the above data. (6 marks)
- iv) Use the ogive in (iii) above to estimate the 70<sup>th</sup> percentile. (3 marks)
- v) Use the same ogive to estimate the first quartile. (2 marks)

b) Explain the procedure that is generally followed in testing hypothesis about population mean. (10 marks)

**QUESTION 2**

a) From the following data relating to the income of employees at Taya Ltd. during the year 2011, compute the standard deviation and the coefficient of variation. (12 marks)

Income (£)	Number of Employees (f)
300 – 399	30
400 – 499	46
500 – 599	58
600 – 699	76
700 – 799	60
800 – 899	50
900 – 999	20
1000 – 1099	10
1100 – 1199	12
1200 - 1299	9

- b) i) What is a sample? (2 marks)
- ii) Explain any **THREE** reasons why a statistician would find it more suitable to study a sample. (6 marks)

**QUESTION 3**

a) Ten competitors in a beauty contest are ranked by three judges in the following order:

Competitors	A	B	C	D	E	F	G	H	I	J
1 <sup>st</sup> Judge	1	6	5	10	3	2	4	9	7	8
2 <sup>nd</sup> Judge	3	5	8	4	7	10	2	1	6	9
3 <sup>rd</sup> Judge	6	4	9	8	1	2	3	10	5	7

**Required:**

Use the rank correlation coefficient to determine which pair of judges has the nearest approach to common tastes in beauty. (16 marks)

b) Highlight why the study of correlation is of immense use in practical life. (4 marks)

**QUESTION 4**

- a) Bingo Ltd has two machines. The old machine produces 35% output and 8 units out of 1000 units are defective. The new machine produces 65% output and 2 units out of 700 units are defective. Determine the probability that a defective unit picked at random was produced by the old machine. **(6 marks)**
- b) A sample of size 49 is taken from a population having a mean of 100 and standard deviation of 14. Find the probability that the mean of this sample will lie between 96 and 104. **(14 marks)**

### QUESTION 5

- a) From the following data, calculate index numbers for 2011 taking 2006 as the base year and using the following formula:
- i) Laspeyre's **(7 marks)**
- ii) Paasche's **(7 marks)**

Year	Price		Wheat		Maize	
	P	Q	P	Q	P	Q
2006	20	80	12	90	5	150
2011	25	100	18	120	10	180

- b) i) Differentiate Type I error from Type II error. **(2 marks)**
- ii) Highlight the major assumptions for t-test. **(4 marks)**