UNIVERSITY OF SWAZILAND

RE SIT EXAMINATION PAPER 2017/2018

TITLE OF PAPER:	DESCRIPTIVE STATISTICS
COURSE CODE:	STA 131/ ST 132
TIME ALLOCATED:	2 (TWO) HOURS
REQUIREMENTS:	STATISTICAL TABLES, GRAPH PAPER AND CALCULATOR
INSTRUCTION:	ANSWER ANY THREE (3) QUESTIONS. THE QUESTIONS CARRY THE MARKS AS INDICATED WITHIN THE PARENTHESIS

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

QUESTION ONE [14+6]

In a study conducted by the Department of Mechanical Engineering at a university, the steel rods supplied by two different companies were compared. Ten sample springs were made out of the steel rods supplied by each company and a measure of flexibility was recorded for each. The data are as follows:

Company A: 9.3 8.8 6.8 8.7 8.5 6.7 8.0 6.5 9.2 7.0
Company B: 11.0 9.8 9.9 10.2 10.1 9.7 11.0 11.1 10.2 9.6

a. Calculate the sample mean, median, and variance for the data for the two companies.
b. Calculate the coefficient of variation for the two companies and comment.

QUESTION TWO [4+4+4+4+4]

a. If A and B are such that P(A) = 0.25, P(B) = 0.35 and P(A u B) = 0.5, find
   i. $P(A \cap B)$
   ii. $P(\overline{A} \cup \overline{B})$
   iii. $P(\overline{A} \cap \overline{B})$
   iv. $P(\overline{A} \mid \overline{B})$

b. If P(A) = 0.5, P(B) = $\frac{1}{3}$ and P(A and B) = $\frac{1}{6}$.
   Are A and B independent? Why?

QUESTION THREE [2+4+4+2+2+2+2+2]

a. Given the following data

X	3	5	6	8	9	12
Y	21	23	28	32	36	54

   i. Calculate $\bar{x}$ and $\bar{y}$
   ii. Calculate b_0 and b_1
   iii. Calculate the coefficient of determination and the coefficient of correlation
   iv. Determine the least square line.

b. Which of the following statements are true and which are false?
   i. A systematic sample is truly random. (True/False)
   ii. Stratified sampling attempts to adequately represent differing groups and population.(True/False)
   iii. A cluster sample will adequately represent a heterogeneous population. (True/False)
   iv. In quota sampling, the interviewer selects his/her own sample. (True/False)

QUESTION FOUR [12+8]

a) The country's X's trade deficit with country Y (billions of Emalangeni) from 2007 through 2014 is reported as shown below

Year :	2007	2008	2009	2010	2011	2012	2013	2014
Deficit:	15.5	16.6	32.1	51.9	52.8	48.2	51.7	66.5

Using exponential smoothing and the smoothing constant $\alpha = 0.7$, what deficit would have been forecast for 2015?

b) The quarterly seasonal indices for a firm's electricity consumption are 115, 92, 81 and 112 for quarters 1-4. It has forecast that electricity consumption will be 850,000 kilowatt – hours during 2017. Forecast electricity consumption for each quarter of 2017.

QUESTION FIVE [6+6+5+3]

a) A company wishes to measure the change in its performance using an index calculated from the data given below on numbers of times sold and the their prices in 2000 and 2001

	2000	
Item	Price	Number
A	2.50	90
B	3.80	150
C	4.10	180

	2001	
Item	Price	Number
A	2.70	200
B	4.00	160
C	4.50	120

Use 2000 as base and calculate for 2001

i. the Laspeyres quantity index
ii. the simple aggregate quantity index

b) The number of senior civil servants (a random sample) who joined work before 8:45am, almost every day, was recorded as follows:

17 17 18 18 18 19 20 21 22 24 24 25 25 26 26 27 27 27 28

i. calculate the coefficient of skewness
ii. estimate the interquartile range

END OF EXAMINATION