UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER 2014

TITLE OF PAPER : DESCRIPTIVE STATISTICS

COURSE CODE : ST 132

TIME ALLOWED : TWO (2) HOURS

REQUIREMENTS : CALCULATOR

INSTRUCTIONS : THIS PAPER HAS FIVE (5) QUESTIONS. ANSWER ANY FOUR (4) QUESTIONS.

Question 1   [25 marks, 8+3+3+2+4+5]

(a) Consider the basic food items in the following table, with their unit price and per capita annual consumption:

Food Items	Unit price (in Emalangeni) 2008	2009	Consumption 2008	2009
Milk (litres)	7.29	7.89	117	98
Bread (loaves)	4.25	4.45	56	64
Sugar (kg)	2.19	2.45	28	20
Maize meal (kg)	5.59	5.25	58	64

    (i) Compute the Laspeyre's price and consumption indices and interpret them.

    (ii) Which food item showed the largest price change from 2008 to 2009?

    (iii) Which food item showed the largest consumption change from 2008 to 2009?

(b) The following table shows Consumer Price Index (CPI) for the period 2005 to 2009.

Year	CPI
2005	95
2006	100
2007	104
2008	110
2009	120

    (i) Compute CPI using 2008 as base year.

    (ii) Compute the average annual percentage change in CPI during 2005 and 2009.

(c) Find the average price paid per share in an equity portfolio consisting of: 40 shares bought for SZL15 each; 10 shares bought for SZL20 each; 5 shares bought for SZL40 each; and 50 shares bought for SZL10 each.

Question 2   [25 marks, 7+10+3+5]

(a) A private game park owner is interested in forecasting the number of visitors (in hundreds) for 2011 using the following data:

Year	Quarter I	II	III	IV
2007	86	62	28	94
2008	106	82	48	114
2009	140	120	82	154
2010	162	140	100	174

    (i) Compute the trend.

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(ii) Deseasonalise the data.

(iii) What do the deseazonalized data show about the number of visitors to the park.

(b) Office rental agreements contain escalation clauses. For a particular office complex in Manzini, the escalation rates based on the previous year rentals over 4 years were 16%, 14%, 10% and 8% respectively. What was the *average annual escalation rate* in office rentals for this office complex over this 4-year period?

Question 3 [25 marks, 8+4+2+7+4]

(a) The following are the daily numbers of cars rented by a car rental company in 90 business days.

Car rentals	Number of days
20-24	3
25-29	10
30-34	21
35-39	28
40-44	14
45-49	9
50-54	5

(i) Calculate the coefficient of skewness.

(ii) Estimate the quartile deviation.

(b) The following table shows the number of guests registered weekly at a health spa and the weekly wage expense for general maintenance workers of the spa's buildings and grounds during the eight-week period.

Week	Number of guests (in hundreds)	Weekly wage expense (in thousands of Emalangeni)
1	3.2	6.8
2	2.9	7.0
3	3.7	7.1
4	2.5	7.8
5	3.3	6.3
6	2.7	7.6
7	2.9	5.8
8	3.4	7.2

You can use these given results: $\sum x^2 = 76.74$, $\sum y^2 = 389.42$, $\sum xy = 170.44$

(i) Identify the dependent variable (y) and the independent variable (x).

(ii) Determine the regression equation. Interpret the regression coefficients.

(iii) Estimate the weekly wage expense if there were 300 guests.

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Question 4 [25 marks, 4+4+4+4+4+5]

(a) Consider the following two-way pivot table of *brand preference* for digital cameras and their *primary usage* (professional and personal).

Usage	Digital Camera Brand Preference		
	Canon	Nikon	Pentax
Professional	48	15	27
Personal	30	95	65

(i) What is the probability of selecting a *professional* user?

(ii) Find the probability that a user prefers the *Pentax brand* given that their usage is primarily for *personal* use?

(iii) What is the likelihood that a randomly selected user prefers the *Canon brand* and is a *professional* user?

(iv) Find the probability of randomly selecting either a *professional* user or a user who prefers the *Nikon brand* of digital camera?

(b) Two groups of bank trainees wrote a banking exam with the following results:

	Mean	Variance	Sample Size
Group 1	76	110	34
Group 2	64	88	26

(i) Compute the mean of the combined *exam scores.*

(ii) Which group showed greater consistency in *exam scores*? Why?

Question 5 [25 marks, 4+2+8+3+8]

The Chamber of Commerce conducted a survey amongst 17 furniture retailers to identify the *percentage of bad debts* in each of the company's debtors' book. The bad debts percentages are as follows:

2.2	4.7	6.3	5.8
5.7	7.2	2.6	2.4
6.1	6.8	2.2	
5.7	3.4	6.6	
1.8	4.4	5.4	

(a) Construct a stem and leaf diagram of the data.

(b) Find the average *% of bad debts* amongst the 17 furniture retailers.

(c) Compute the first quartile and the third quartile of the *% of bad debts* amongst the 17 furniture retailers surveyed. Interpret these quartiles.

(d) The chamber of commerce monitors bad debts levels based on samples of companies. It will advise an industry to take corrective action if the % of bad debts, on average, exceeds 5%. Should the chamber of commerce send out an advisory note to all furniture retailers based on these sample findings? Justify your answer.

(e) Calculate the coefficient of skewness. Interpret this result.