UNIVERSITY OF PERADENIYA, SRI LANKA
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பேராதனைப் பல்கலைக்கழகம், இலங்கை

First Year (100 level) Examination in Bachelor of Arts
External New Syllabus
Introduction to Statistics (SUPE 009)
April 2017
Answer Five Questions only
Time: Three hours
Calculators are allowed.

State whether the following Statements are True or False. If false, correct it.

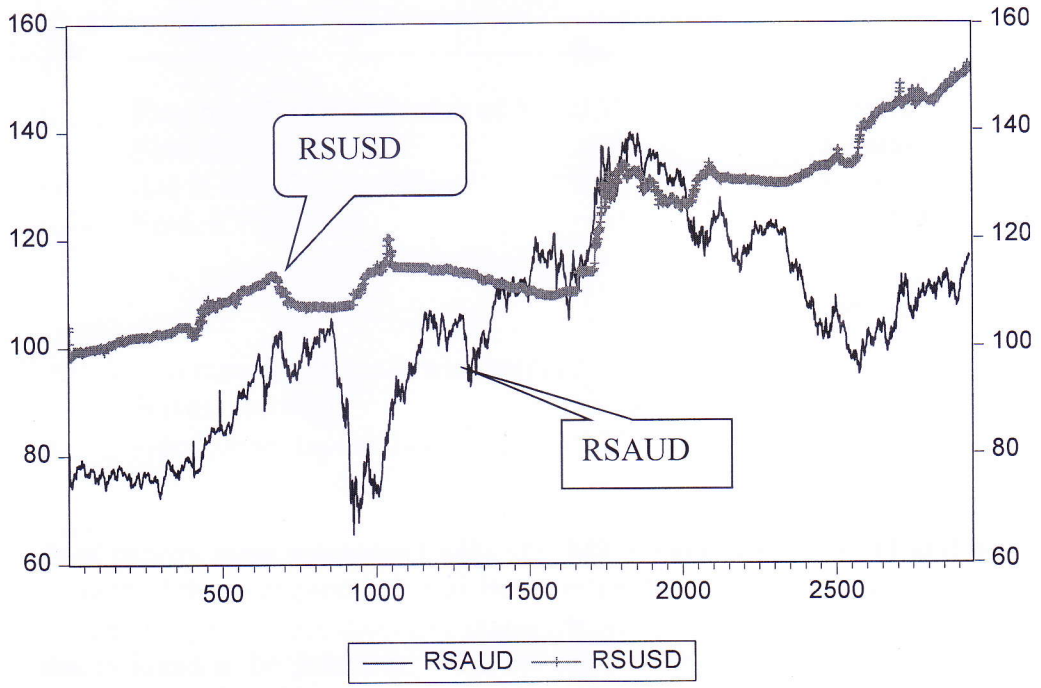
1. If X is random variable with mean μ, var(X) is always positive
2. A longer tail to right means distribution is positively skewed.
3. If two events A and B are mutually exclusive the probability of occurrence of either A or B is given by P(A)P(B) .
4. Regression line describes conditional mean behaviour of a random variable
5. Histogram is a bar chart
6. The standard error is a measure of the variability of a probability distribution of a statistic
7. The Coefficient of variation is appropriate for comparing the variability within different data sets.
8. Standard deviation and standard error are used to measure variability
9. If population is binomial, distribution of the sample mean could be a normal
10. If probability value is greater than 0.05 we can reject the null hypothesis

2. a. Consider the following probability distribution.

x	P(x)	xP(x)	$x^2P(x)$
1	0.2		
2	0.25		
3	0.4		
4	k		
5	0.05		
total	$\sum P(x) = --$	$\sum xp(x) = ----$	$\sum x^2 p(x) = ----$

i. Find k. (03 marks)
ii. Fill the blanks. (10 marks)
iii. Draw vertical line graph to illustrate the distribution. (04 marks)
iv. Find P(2<x<5). (03 marks)

3.a. Distributions of two daily exchange rates(USD, AUD) of Sri Lankan rupee for the period of Jan 3, 2005- Feb 28, 2017 are shown in the following Figure. Compare the two exchange rates behavior using statistical measures.
(10 marks)



b. Describe the main features of the exchange rates distributions of Sri Lankan rupee using the following information. (10 marks)

	RSAUD	RSEURO	RSGBP	RSUSD
Mean	103.1014	154.4882	196.1800	119.7330
Median	103.7150	157.1500	195.1650	114.2350
Maximum	139.7100	181.8600	233.1050	152.2650
Minimum	65.40500	118.9000	155.4450	98.20500
Std. Dev.	17.68906	15.24162	17.04214	14.17200
Skewness	-0.057091	-0.572581	-0.013611	0.484447
Kurtosis	2.148525	2.652173	1.894150	2.070580
Jarque-Bera	90.25703	175.1681	149.6417	220.4404
Probability	0.000000	0.000000	0.000000	0.000000
Observations	2935	2935	2935	2935

4. The joint probability distribution of X and Y is shown in the following Table.

X / Y	X1	X2	X3	
Y1	0.1	0.1	0.15	
Y2	0.05	0.1	0.2	
Y3	0.15	0.1	0.05	

i. Find marginal distribution of X and Y. (5 marks)
ii. Find E(X) and V(Y). (5 marks)
iii. Are X and Y independent? (5 marks)
iv. Find f(Y1|X2). (5 marks)

5. a. What do you mean by the following terms ?
i. Bayes' theorem
ii. Conditional probability

(6 marks)

b. In a factory three machines,(M1, M2, M3) manufacture 25, 35 and 40 percent of the total production of Bulbs respectively. Of their total output 5, 4, and 2 percent are defective respectively. A bulb is selected randomly and is found to be defective. What are the probabilities that the defective was manufactured by the machines M1, M2 and M3?

(14marks)

6. a. What do you mean by the following terms?.
i Sampling error
ii. Measurement error

(8 marks)

b What are the qualities of a good questionnaire?. (6 marks)

c. Differentiate the following
i. Primary data and secondary data.
ii. The Pilot survey and Main survey. (6 marks)

7. Write short notes for the following
i. Null hypothesis and alternative hypothesis
ii. Point estimator and interval estimator
iii. Simple Random sampling
iv. Relative frequency and probability (5 marks each)