

167

## UNIVERSITY OF COLOMBO, SRI LANKA



UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Academic Year 2016/2017 - Second Year Examination - Semester II = 2019

## SCS2211-Laboratory II - Part A

TWO (2) HOURS (for A+B)

To be completed by the c	candidate
Examination Index No:	

## **Important Instructions to candidates:**

- 1. The medium of instruction and question is English.
- 2. Write your answers in English.
- 3. If a page or a part of this question paper is not printed, please inform the supervisor immediately.
- 4. Note that questions appear on both sides of the paper. If a page is not printed, please inform the supervisor immediately.
- 5. Write your index number on each and every page of the Question paper.
- 6. This paper has **04** questions and **18** pages.
- 7. Answer ALL questions. All questions carry equal marks (25 marks).
- 8. This paper consists of two parts, Part A (Question No 1 and Question No 2) and Part B (Question No 3 and Question No 4) and submit separately.
- 9. Any electronic device capable of storing and retrieving text including electronic dictionaries and mobile phones are not allowed.
- 10. Non-Programmable calculators are allowed.

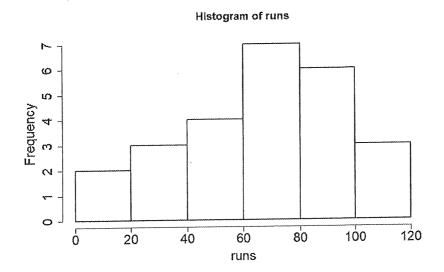
For Examiner's use only					
Question No	Marks				
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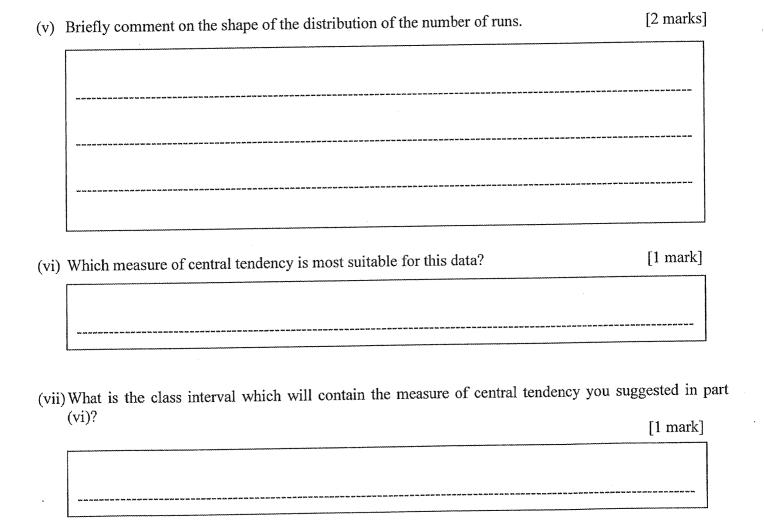
Identify the scale of measurement of the variable "the number of runs scored".  Specify whether the variable "the number of runs scored" is discrete or continuous.  The data recorded during 13 innings of the first 6 months of the year are as follows:  50, 40, 55, 60, 35, 65, 78, 45, 38, 64, 73, 66, 78  Arrange the above data in a stem and leaf plot.  Stem Leaf  Leaf	[1 mark]		
The data recorded during 13 innings of the first 6 months of the year are as follows: 50, 40, 55, 60, 35, 65, 78, 45, 38, 64, 73, 66, 78  Arrange the above data in a stem and leaf plot.	[1 mark]		
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50, 40, 55, 60, 35, 65, 78, 45, 38, 64, 73, 66, 78  Arrange the above data in a stem and leaf plot.			
50, 40, 55, 60, 35, 65, 78, 45, 38, 64, 73, 66, 78  Arrange the above data in a stem and leaf plot.	**************************************		
Arrange the above data in a stem and leaf plot.			
<i>P</i> 3.4		35, 65, 78, 45, 38, 64, 73, 66, 78	50, 40, 55, 60
Stem Leaf	[3 marks	of plot.	e the above data in a stem and
		Leaf	Stem
		•	
Find the median value of the above data.	[2 marks		median value of the above da

Index No: ......

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The student's favourite cricketer has played for 25 international cricket matches during the entire year. The histogram drawn for the number of runs recorded for the entire year is given below.





using the previous calculations/findings.	[2:
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group of students from a private medical institution in USA a birth weight is different in white mothers compared to black mot white mothers and 25 black mothers who got admitted to the cent the weight (in grams) of the new born infants.	hers. They selected 2 random ral hospital for delivery and r
outh weight is different in white mothers compared to black mot white mothers and 25 black mothers who got admitted to the cent h weight (in grams) of the new born infants.	hers. They selected 2 random ral hospital for delivery and rand rand for delivery and random (Define any notations used)
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data: white and black t = 2.5119, df = 48, p-value = 0.01543

95 percent confidence interval: 86.23408 778.08592 sample estimates: mean of x mean of y 3124.56 2692.40

i) State two important assumptions which should be satisfied in order to carry o	[2 mark
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) What is the value of the test statistic?	[1 mark]
	o par any the see has he had had see the high had had not see the the had had beer past
State the statistical conclusion of the test at 5% level of significance.	[3 marks
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State the general conclusion arising from the above test.	[2 mark]
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Index No: .....

Que	stion 2
(a)	The dataset "all.mammals.milk" contains a list of animals and the constituents of their milk. It contains two variables; percentage of water (water) and percentage of protein (protein) and a researcher is interested in knowing whether there is any linear relationship between these two variables.
(i)	Suggest a suitable graph which could reveal the above relationship. [2 marks]
(ii)	Suppose the graph drawn indicated that there is a negative linear relationship between the two variables. Suggest a measure which can quantify the strength of this relationship. [2 marks]
(iii)	The researcher next aims at predicting the percentage of protein in milk, when the percentage of water is given. What statistical technique should be used to obtain such predictions? [2 marks]
	The following R code and outputs were obtained for the above-mentioned analysis.
	<pre>&gt; fit&lt;-lm(protein~water) &gt; summary(fit)</pre>
	Call: lm(formula = protein ~ water)
	Residuals: Min 10 Median 30 Max -4.2237 -1.8119 0.2098 1.7639 4.6237
	Coefficients:
	Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.443 on 23 degrees of freedom Multiple R-squared: 0.5712, Adjusted R-squared: 0.5525 F-statistic: 30.63 on 1 and 23 DF, p-value: 1.25e-05

Index No: .....

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) The researcher an F-test. Write	wishes to check whedown the null and	hether the related alternative hypertending	tionship between potheses for thi	en the two vari	ables is sig	١.
an F-test. Write	down the null and	alternative hyp	potheses for thi	s test in standa	rd notation	1. [2 mark
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an F-test. Write	cet p-value, carry	alternative hypotherese and a test to	potheses for thi	s test in standa	rd notation	t. [2 mark

Index No: .....

	the type of clustering method that you can suggest for the researcher?	[2 mark
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	Cluster Dendrogram	
	- 20	
Height	Q -	
	above diagram illustrates the output from the clustering method he followers has he identified among the animals?	d. How m
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<u> </u>		ionand sta
	ng the process he followed, he reached the above number of clusters in the sering. State whether he has used agglomerative method or divisive method.	[2 marks
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