MATH1019 LINEAR ALGEBRA AND STATISTICS FOR ENGINEERS
Lab Test (a)
Semester 2, 2017

Marks: /20

Declaration: *I hereby undertake not to discuss or divulge the content or format of the test paper with any other person until all tests have been written, and declare that I have no prior knowledge of the contents of the test paper.*

I unconditionally accept any action that may be taken should Curtin University consider that an infringement of the statute No. 10 of the Student Disciplinary Statute has occurred.

Name: **ID**: **Signature**: **Date**: / / 2017

Instructions: Download the "Lab_Test_Template.docx" *Word* document from the Unit Materials folder in Blackboard and save it in your *I*-drive directory as *Your Name Your ID*, for example: *Joe Smith 2456892.docx*. Your test solutions will be stored in this document. Some questions will require you to copy commands/output from *R* and paste it into this document. Once you have completed the test, save this document and **email it to your tutor**. Return this test paper with your name, student ID, signature and date to your tutor before you leave the room.

Question 1

Load the data set **Loblolly** into *R* using the command **data("Loblolly")**. Answer the following questions with reference to the variable **height**. **Use R for all steps**.

a) Obtain the five number summary. Identify the five numbers as min, max, etc. [3 marks]
b) What is the inter-quartile range? [1 mark]
c) Obtain a box plot for the variable with appropriate labels and paste it into your document. Are there any outliers? [3 marks]
d) Obtain a histogram for the variable with appropriate labels and paste it into your document. [2 marks]

e) Find the 90% confidence interval for the variable assuming that σ is known and is equal to s. Paste your *R* commands into the document. [3 marks]
f) True or False:"The probability that the mean lies in the 90% confidence interval you calculated above is 0.9." [1 mark]

Question 2

If X is a Normally distributed random variable with $\mu = 25$ and $\sigma = 6$, calculate the following using *R*. Paste *R* commands into your document:

a) $P(18 < X < 27)$ [2 marks]
b) Find k such that $P(X < k) = 0.7352$. [2 marks]

Question 3

Generate 100 means for samples of size 10 from the digits 1 to 6. Plot your results using a histogram. What do you notice? Paste the histogram into your document. [3 marks]