

COMMONWEALTH OF AUSTRALIA

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Family Name	
Given Names	
Student Number	
Teaching Period	Semester 2 Special/Summer Semester, 2016

FINAL EXAMINATION	DURATION				
QAB105 – Quantitative Analysis for Business	<table border="1"> <tr> <td>Reading Time:</td> <td>10 minutes</td> </tr> <tr> <td>Writing Time:</td> <td>180 minutes</td> </tr> </table>	Reading Time:	10 minutes	Writing Time:	180 minutes
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INSTRUCTIONS TO CANDIDATES

1. There are two sections. Section A is Multiple Choice, section B is Short answers.
2. Please answer all the sections in the Answer Booklet provided.
3. For multiple choice answers please clearly write the letter corresponding to the correct answer.
4. Please clearly mark the sections you are answering.

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a RESTRICTED OPEN BOOK examination

Any non-programmable calculator is permitted

No handwritten notes are permitted

Any hard copy, unannotated English dictionary is permitted

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
No additional printed material is permitted	1 x 16 Page Book 1 x Scrap Paper Formula Sheet/s Statistical Table/s

**THIS EXAMINATION IS PRINTED
DOUBLE-SIDED.**

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Section A
Multiple Choice Questions
Total No of Marks for this section: 10 Marks

This section should be answered in the answer booklet provided.
Please clearly write only the letter corresponding to the correct answer.

Marks for each question are indicated.
Suggested Time allocation for Section A: 30 minutes

Section B
Short Answer Questions
Total No of Marks for this section: 40

This section also should be answered in the Answer Booklet provided.

Marks for each question are indicated.
Suggested Time allocation for Section B: 150 minutes

Question 1

- a. The mean of a sample of 15 measurements is 35.6. Suppose that the sample is enlarged to 16 measurements, by including one additional measurement having a value of 42. Find the mean of the sample of 16 measurements. (Marks: 1)
- b. Suppose that an analysis of a set of data reveals that $Q_1 = 45$, $Q_2 = 85$ and $Q_3 = 105$.
- (i) What does this statistics tell you about the shape of the distribution? (Marks: 1)
- (ii) What can you say about the relative position of each of the observations 34, 84 and 104? (Marks: 1)
- (iii) Calculate the interquartile range? (Marks: 1)
- (iv) What does interquartile range tell you about the data? (Marks: 1)

Question 2

- a. X represents the number of computers in Australian households who own computers. The probability distribution of X is as follows:

X	1	2	3	4	5
$p(X)$	0.25	0.33	0.17	0.15	0.10

What is the probability that a randomly selected Australian household will have:

- i) more than two computers? (Marks: 1)
- ii) between 2 and 5 computers, inclusive? (Marks: 1)
- iii) fewer than 3 computers? (Marks: 1)
- b. Determine the sample size needed to estimate the population mean to within 2 units with a 95% confidence when the population standard deviation equals 8. (Marks: 2)

- c. A random sample of 64 observations has a mean of 30. The population variance is assumed to be 9. What is the 85.3% confidence interval estimate (to the third decimal place) for the population mean?

(Marks: 5)

Question 3

- a. On a popular self-image test that results in normally distributed scores, the mean score for public-assistance is expected to be 65. A random sample of 28 public-assistance recipients in Emerson County is given the test. They achieve a mean score of 62.1, and their scores have a standard deviation of 5.83. Do the Emerson Country public-assistance recipients test differently, an average, than what is expected at the 0.02 level of significance?

(Marks: 5)

- b. "Particle size" is an important property of latex paint and is monitored during production as part of the quality-control process. Thirteen particle-size measurements were taken using the Dwight P. Joyce Disc, and the sample mean was 3978.1 angstroms. The particle size x , is normally distributed with a standard deviation $\sigma = 200$ angstroms. Find the 98% confidence interval for the mean particle size for this batch of paint.

(Marks: 5)

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Question 4

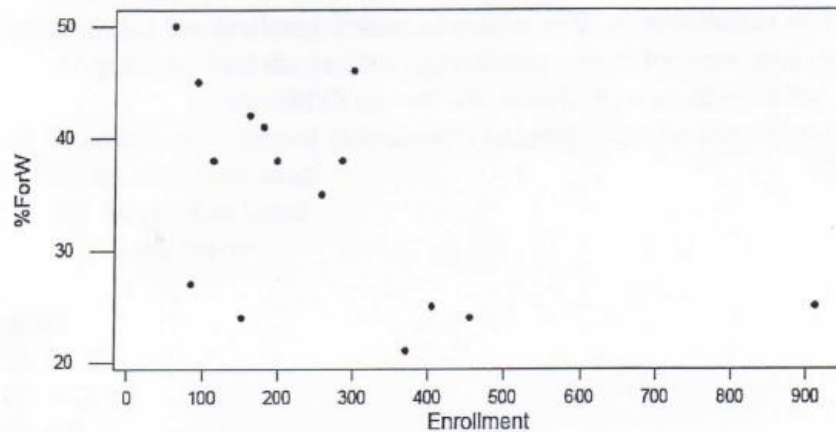
The scatterplot and the regression output below are for numbers of students enrolled in a variety of courses in a region's colleges and universities, and the percentages of students in those courses receiving F or W grades.

The regression equation is

$$\%ForW = 40.8 - 0.0231 \text{ Enrollment}$$

Predictor	Coef	SE Coef	T	P
Constant	40.801	3.541	11.52	0.000
Enrollme	-0.02307	0.01043	-2.21	0.045

S = 8.383 R-Sq = 27.4% R-Sq(adj) = 21.8%



- What is the correlation r ?
(Marks: 2)
- What does the data suggest is the relationship between class size and grade?
(Marks: 1)
- If the failure rate is the explanatory variable and enrolment is the response, what would happen to the regression line and why?
(Marks: 4)
- Use the regression line to predict the failure rate for a business statistics course with an enrolment of 300 students.
(Marks: 2)
- If in fact the business statistics course with an enrolment of 300 students had a failure of 46 percent, find the residual (prediction error) for your prediction in part (iv).
(Marks: 3)
- Comment on if this model can be used to make predictions.
(Marks: 3)