

Uva Wellassa University

Faculty of Management

Degree of Bachelor of Business Management in Entrepreneurship and Management

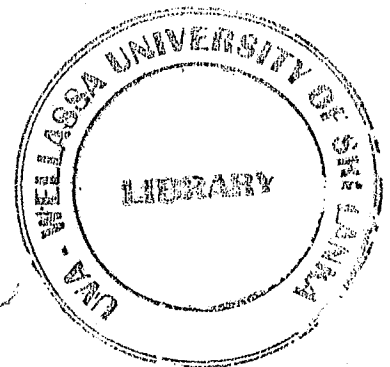
200 LEVEL 1st SEMESTER EXAMINATION – JUNE / JULY 2017

ENM261-3 Business Statistics



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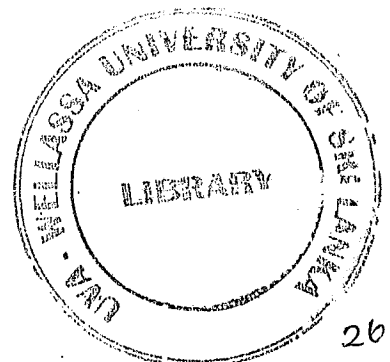
Part C: Essay Questions

1.

- a) Trace metals in drinking water affect the flavor and an unusually high concentration can pose a health hazard. Ten pairs of data were taken measuring zinc concentration in bottom water and surface water in sample location.

Location	Zn concentration in bottom water	Zn concentration in surface water
1	4.30	4.15
2	2.66	2.38
3	5.67	3.90
4	5.31	4.10
5	7.07	6.05
6	7.16	6.09
7	6.51	6.32
8	5.89	5.23
9	4.69	4.11
10	7.23	6.12

- i. Construct the 95% confidence interval for true mean difference between the Zn concentration in bottom water and the Zn concentration in surface water. (4 Marks)
- ii. Write down relevant hypothesis to test on the claim of "There is no significance difference between the Zn concentration in bottom water and the Zn concentration in surface water". (3 Marks)
- iii. Test the above mentioned hypothesis at $\alpha = 0.05$ and interpret your results. (7 Marks)
- b) An experiment is conducted to compare intensive tutoring (covering a great deal of material in a fixed amount of time) with paced tutoring (covering less material in the same amount of time). Two randomly chosen groups are tutored separately and then administered proficiency tests. Assume that the population variances are equal.



Group	Method	n	\bar{x}	s
1	Intensive	12	46.31	6.44
2	Paced	10	42.79	7.52

- i. Write down relevant hypothesis to test on "There is no difference among the intensive and paced methods". (2 Marks)
- ii. Test the above mentioned hypothesis at $\alpha = 0.05$ and interpret obtained results. (4 Marks)

2.

- a) A life insurance salesman sells on the average 3 life insurance policies per week. Use Poisson's law to calculate the probability that in a given week he will sell
 - i. Some policies (3 Marks)
 - ii. 2 or more policies but less than 5 policies (3 Marks)
 - iii. Assuming that there are 5 working days per week, what is the probability that in a given day he will sell one policy (4 Marks)

- b) The Edwards's Theater chain has studied its movie customers to determine how much money they spend on concessions. The study revealed that the spending distribution is approximately normally distributed with a mean of \$4.11 and a standard deviation of \$1.37.
 - i. What percentage of customers will spend less than \$3.00? (3 marks)
 - ii. What percentage of customers will spend in between \$3.00 and \$4.00? (3 marks)
 - iii. Calculate to the spending amount corresponds to the top 87th percentile? (4 marks)

Useful Formula

$$\bar{x} = \frac{\sum x_i}{n}$$

$$S.D. = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n - 1}}$$

$$S_p = \sqrt{\frac{(n_1 - 1) S_1^2 + (n_2 - 1) S_2^2}{(n_1 + n_2 - 2)}}$$

$$r = \frac{n(\sum x_i y_i) - (\sum x_i)(\sum y_i)}{\sqrt{[n \sum x_i^2 - (\sum x_i)^2][n \sum y_i^2 - (\sum y_i)^2]}}$$

$$\hat{\beta}_1 = \frac{S_{xy}}{S_{xx}}$$

$$\hat{\beta}_0 = \bar{Y} - \hat{\beta}_1 \bar{X}$$

$$S_{xx} = \sum x_i^2 - n\bar{x}^2$$

$$S_{yy} = \sum y_i^2 - n\bar{y}^2$$

$$S_{xy} = \sum x_i y_i - n\bar{x}\bar{y}$$

$$SSR = \hat{\beta}_1^2 S_{xx}$$

$$SST = S_{yy}$$

