



University of Kelaniya – Sri Lanka

External Examinations Branch

Faculty of Commerce and Management

Bachelor of Commerce (Special) Degree Examination (External) – 2009

Year II

October/ November 2010

BCOM E 2035 – Business Statistics

No. of questions: Six (06)

Time: 03 hours

Answer any five (05) questions.

Graph papers and statistical tables are provided. Use of calculators will be allowed.

(01) a) “Business and other organizations often employ statistical analyses of data to help in improving their processes”.

What do you mean by statistical analysis?

(04 marks)

b) You are given the following data in relation to height of 35 students in a certain class of a school.

132	167	108	131	125	149	158
145	158	140	146	148	152	143
165	124	138	178	115	153	162
146	172	147	119	152	137	135
160	144	135	142	156	145	128

Using the above data,

(i) Construct a frequency distribution.

(03 marks)

(ii) Construct the histogram.

(03 marks)

(iii) Find the inter-quartile range.

(06 marks)

c) Distinguish between measures of central tendency and the measures of dispersion.

(04 marks)

(Total 20 marks)

(02) a) Briefly explain the following in relation to probability.

(i) Mutually and Non-mutually exclusive events.

(ii) Independent and Dependent events.

(06 marks)

b) Distinguish between probability mass function and probability density function. (02 marks)

c) A company has a total of 1000 employees. 450 of them work in section A and others in section B. The company wishes to introduce new promotional scheme. A total of 550 employees favoured the scheme including 250 from the section A.

- i) Construct the joint probability table showing marginal probabilities also.
- ii) Find the probability that employee is selected at random,
 - I. A person who favours the new scheme and works in section A.
 - II. A person who does not favour the scheme given that the person works in section B.

(06 marks)

d) Monthly demand for a certain product is known to have the following probability distribution.

Demand (x)	1	2	3	4	5	6
Probability	0.1	0.15	0.25	0.20	0.25	0.05

- i) Determine the expected demand for the product.
- ii) Suppose that the cost of producing x products is given by the function,

$$C = 12,000 + 500x.$$

Determine the expected cost.

(06 marks)
(Total 20 marks)

(03) a) State the properties of the binomial experiment.

(04 marks)

b) In a certain city 30% of the population is consuming Soya Food. If a sample of 30 persons was selected, calculate the probability, that

- i) 04 persons consume Soya food.
- ii) At least 03 persons consume Soya food.
- iii) Calculate the mean and the standard deviation of the above.

(10 marks)

c) The average number of vehicles arriving in a 20 minutes time period to a super market is 10.

Calculate the probability that,

- i) Exactly 5 vehicles arrive in 20 minutes time period.
- ii) Less than 2 vehicles arrive in 5 minutes time period.

(06 marks)
(Total 20 marks)

(04) a) Distinguish between point estimator and interval estimator. What are the properties of a good estimator?

(06 marks)

b) The weights of persons using a lift are known to be normally distributed. A random sample of 10 people gives the following weights (in Kg)

63, 65, 70, 81, 72, 58, 55, 76, 74, 80

Construct a 95% confidence interval for the population mean.

(06 marks)

c) A company has 150 employees. Their average annual salary is computed to be Rs. 50,000 with a standard deviation of Rs. 6,000. A random sample of 80 employees is selected. Calculate the standard error of means.

(02 marks)

d) Briefly explain the following.

i) Sampling errors.

ii) Multi-stage sampling.

iii) Population parameters.

(06 marks)

(Total 20 marks)

(05) a) Explain why regression analysis technique is important for many practical situations.

(04 marks)

b) The following table shows the life time and maintenance cost for 10 motor vehicles of a certain motor vehicle company.

Life time (x) (years)	Maintenance (y) Cost (Rs. '000)
04	46
05	19
03	20
08	27
07	50
06	62
09	46
13	41
02	17
01	04

i) Find the regression equation x on y using the method of least squares.

(06 marks)

ii) Test the statistical significance of the regression model at 5% level of significance.

(10 marks)
(Total 20 marks)

(06) a) Explain what is meant by goodness of fit tests.

(04 marks)

b) Explain the following concepts in relation to hypothesis testing.

i) Type I error and Type II error.

ii) Critical region and acceptance region.

(06 marks)

c) A research firm wants to investigate buying habits of Buddhist and Non-Buddhist families for liquor consumption. A sample of 1000 families was taken and the results obtained from the sample are as follows.

	Buddhist	Non-Buddhist	Total
Consumption of liquor	236	160	396
Non-consumption of liquor	521	83	604
Total	757	243	1,000

Test whether there is any significant difference between consumption of liquor among Buddhist and non-Buddhist families. (Assume that the level of significance is 0.05).

(10 marks)
(Total 20 marks)