UNIVERSITY OF KELANIYA – SRI LANKA

Centre for Distance and Continuing Education

Faculty of Commerce & Management Studies

Bachelor of Business Management (General) Degree Second Examination (External) – 2011

December 2013

BMGT E 2045 – Statistics for Management

No of questions – 07 Time: 03 Hours

Answer any five (05) questions only

(01) a) What is Statistics?

(2 marks)

b) What are the features of statistics? Explain.

(4 marks)

c) Discuss the importance of statistics in the field of business management.

(5 marks)

d) I) Distinguish between continuous and discrete variables.

(4 marks)

II) State which of the following variables are discrete and continuous?

i) Number of children in a family.

ii) Heights of students of a class in inches.

iii) Life time of television tubes produced by a company.

iv) Number of accidents in Colombo district during a year.

v) Temperature recorded every hour at a weather bureau.

(5 marks)
(Total 20 marks)

(02) a) i) What do you mean by measures of central tendency? Explain.

ii) What purposes do they serve?

(4 marks)

b) The following table gives the weekly earnings (in Rupees) of 2500 persons.

Weekly earnings (in Rupees)	No. of persons
3000 - 3100	30
3100 - 3200	85
3200 - 3300	300
3300 - 3400	365
3400 - 3500	500

3500 - 3600	540
3600 - 3700	350
3700 - 3800	240
3800 - 3900	50
3900 - 4000	40

i) What is the mean earning?

ii) What is the median earning?

iii) What is the most usual earning?

iv) What are the earning limits for central 50% of the wage earns?

v) What percentage earned less than Rs. 3600/=?

vi) What percentage of persons is engaged in earning between Rs. 3400/= and Rs. 4000/=?

vii) What are the values of 25^{th} and 75^{th} percentiles for weekly earnings?

viii) According to the above result (part vii) , what do you know about the distribution of weekly earnings?

(14 marks)

c) Suppose you have a set of data with mean $\overline{X}$= 10 and standard deviation S=2. How do you interpret this information?

(02 marks)

(Total 20 marks)

(03) a) Define the following terms.

i) Mutually exclusive events.

ii) Independent events.

iii) Compound events.

iv) Sample space. (4 marks)

b) A and B are two mutually exclusive events such that,

P (A) = 0.30 and

P (B) = 0.60,

Find

i. $P(\overline{A})$

ii. $P(A \cap B)$

iii. $P(A \cup B)$

iv. $P(\overline{A} \cup \overline{B})$ (4 marks)

c) A manufacturer of an electric kitchen utensil conducted a survey of consumer complaints. The results are summarized in the following table;

Reason for complain

	Electrical	Mechanical	Appearance	Total
During Guarantee Period	18%	13%	32%	63%
After Guarantee Period	12%	22%	03%	37%
Total	30%	35%	35%	100%

(i) Calculate the probability that a customer complains about appearance

(ii) Calculate the probability that a customer complains about appearance given that the complaint occurred during the guarantee time.

(iii) Calculate the probability that complaint occurred after the guarantee period given that the customer complains about Electrical problem.

(12 marks)
(Total 20 marks)

(04) a) Distinguish the poisson distribution and Binomial distribution.

(2 marks)

b) First bag contains 6 red and 4 white balls and second bag contains 5 red balls and 4 white balls. A bag is selected at random and then a ball is drawn from it. Find the probability of getting a white ball.

(4 marks)

c) Average percentage of failure in a certain examination is 60. What is the probability that out of a group of 10 candidates, at least 4 passed in the examination?

(4 marks)

d) In a bank, people arrive per minute on average is 3. Find the probability that, in a given minute, exactly 2 people will arrive.

(4 marks)

e) A weekly income of a large group of middle managers are normally distributed with a mean of Rs. 8000 and a standard deviation of Rs. 450.

i) What is the probability of finding a middle manager with a weekly income of between Rs. 8400 and Rs. 9000.

ii) What is the percentage of middle managers that earn more than Rs. 9005 per week?

iii) Above what income would the top 10% of the managers earn?

iv) below what income would the lowest 5% of the managers earn?

(6 marks)
(Total 20 marks)

(05) As the regional manager of a pizza business you are interested in understanding how income in a region affects pizza sales. Below is a regression output for pizza sales (in thousands of rupees) regressed on the average household income of an area (in thousands rupees).

Linear Fit

Pizza Sales (Rs'000) = 14.577381 + 2.9047619*Income (Rs'000)

Summary of Fit

RSquare	0.96832
RSquare Adj	0.96304
Root Mean Square Error	3.108329
Mean of Response	43.625
Observations (or Sum Wgts)	8

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1771.9048	1771.90	183.3946
Error	6	57.9702	9.66	Prob > F
C. Total	7	1829.8750		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	14.577381	2.410088	6.05	0.0009*
Income (Rs'000)	2.9047619	0.214495	13.54	<.0001*

(i) What is the average pizza sales across all eight regions?

(ii) What does the p-value for the income variable mean?

(iii) What is the interpretation of the slope of regression line?

(iv) What does the model predict for pizza sales in a region with an average household income of Rs. 40,000?

(v) What can you conclude about the estimated intercept?

(vi) What is the interpretation of the R^2 ?

(vii) What is the Root mean Square Error?

(20 marks)

(06) a) i) What is a sampling distribution?

ii) What is the sampling distribution of the sample mean? Why is it useful?

iii) Differentiate between point estimate and interval estimate.

(5 marks)

b) A Factory produces 25,000 garments per day. From a sample of 200 garments, 2% were found to be for less expected quality. Estimate the number of garments can be expected to be of less quality in the daily production and assign limits of 5% level of significance.

(5 marks)

c) From a population of 540 a sample of 60 individuals is taken. From this sample, the mean is found to be 6.2 and the standard deviation 1.368.

i) Find the estimated standard error of the mean.

ii) Construct a 96 percent confidence intervals for the mean.

(10 marks)
(Total 20 marks)

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(07) a) Describe the types of errors considered in Hypotheses testing.

(2 marks)

b) What do you mean by the following terms?

i) Degree of freedom.

ii) Contingency table.

iii) Null Hypothesis. (3 marks)

c) Average daily wages of a certain company is Rs. 500/- and standard deviation is Rs. 70/-. After testing a random sample of 400 wages is found that average daily wage is Rs. 450/-. Is there any evidence that employees are paid less wages?

(Assume 5% significance level)(show your calculations)

(5 marks)

d) The following table shows the information of 400 persons those who posses computer and do not posses.

Persons group	Business means	Government Servants	Others	Total
Persons who posses the computer	150	60	20	230
Persons who do not posses the computer	45	68	57	170
Total	195	128	77	400

Test to see whether there is a relationship between persons group and possessing a computer. Explain the answer.

(5 marks)

(e) A maker of a certain model car claimed that his car averaged at least 31 Kilometres per litter of petrol. A sample of nine cars was selected and each car was driven with one litter of regular petrol. The sample showed a mean of 29.43 Kilometres with a standard deviation of 3 Kilometres. Using a 0.05 level of significance, what do you conclude about the manufacturers claim? Justify your answer.

(05 marks)

(Total 20 marks)