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) – 2013

January - 2017

BMGT E2045 – Statistics for Management

No of questions – Eight (08) Time: 03 Hours

Answer any five (05) questions.

Statistical tables are provided.

(01) a) What is meant by Business Statistics. How does it help for a manager?

(04 marks)

b) Distinguish between continuous and discrete variables.

(04 marks)

c) State which of the following variables are discrete or continuous.

i) Number of children of a family.

ii) Height of students of a class in inches.

iii) Yearly income of school teachers in rupees.

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

(04 marks)

d) What is a random variable? What are the main types of random variables?

(04 marks)

e) Distinguish between primary and secondary data. Describe the various methods of collecting primary data.

(04 marks)

(Total 20 Marks)

(02) a) What do you mean by a "frequency distribution". Explain with a suitable example.

(04 marks)

b) What do you mean by measures of central tendency? What purpose do they serve?

(04 marks)

c) A random survey of 100 school girls have been given the following distribution of hours spent per week doing unpaid household work.

Hours	**No. of girls**
0 to < 5	1
5 to < 10	18
10 to < 15	24
15 to < 20	25
20 to < 25	18
25 to < 30	12
30 to < 35	1
35 to < 40	1

i. Using above data, draw the cumulative frequency curve. (Ogive)

ii. From the above curve, find an approximate median value. What does this value indicate?

iii. Calculate the mean. What does this value indicate?

iv. Briefly describe the comparison between the mean, median and mode.

(08 marks)

d) What is Skewness? Explain the main types of skewed curves.

(04 marks)

(Total 20 Marks)

(03) a) Define probability and explain its importance in the field of business.

(04 marks)

b) Suppose that $P(A) = 0.4$ $P(B) = 0.3$ and $P[(A \cup B)^c] = 0.42$

Are A and B independent?

(Show your calculations) (04 marks)

c) In a factory, there are 100 units of a certain product, 5 of which are defective. If you pick three units from the 100 units at random, what will the probability that none of them are defective?

(04 marks)

d) The average percentage of failures in a certain examination is 40. What is the probability that out of a group of 6 candidates, at least 4 passed in the examination?

(04 marks)

e) Table fans produced by the Star company was found to be defective items (D). Under the star company there are there factories (A, B, C), where such table fans are manufactured. A quality controller is responsible for the source of found defects. This is what the quality controller knows about the company's fan production and possible source of defects.

Factory	% of production	Probability of defective fans
A	0.35 = P(A)	0.015 = P(D/A)
B	0.35 = P(B)	0.010 = P(D/B)
C	0.30 = P(C)	0.020 = P(D/C)

If a random selected fan is defective, what is the probability that the fan was manufactured in factory C?

(04 marks)

(Total 20 Marks)

(04) a) What is the "Central Limit Theorem"? Explain.

(04 marks)

b) The monthly salaries of employees in a company are approximate normally distributed with a mean of Rs. 50,000 and a standard deviation of Rs. 20,000.

(i) What percent of people earn less than Rs. 40,000?

(ii) What percent of people earn between Rs. 45,000 and 65,000?

(iii) What percent of people earn more than Rs. 70,000?

(iv) Suppose you are employed in this company. What would be your wage if 3/4 of all workers earn more than you?

(16 marks)

(Total 20 Marks)

(05) a) Three things influence the standard error in a confidence interval estimate of a population mean; sample size,
Variability in the population and
confidence level.

Explain what does happen to the standard error as that quantity increase separately.

(04 marks)

b) What is the interpretation of a 95% confidence interval for the mean.

(04 marks)

c) Out of 300 students in a school, 225 passed an exam. If you take a random sample of 10 of these students, what will be the standard error of proportion?

(04 marks)

d) The mean height of 15 year old boys is 175 cm and the variance is 64 cm. For the same age girls the mean is 165 cm and the variance is 64 cm. If 8 boys and 8 girls were sampled, what is the probability that the mean height of the sample of boys would be at least 6 cm higher than the mean height of the sample of girls?

(08 marks)

(Total 20 Marks)

(06) Below is a regression output of a monthly insurance premium (in rupees) regressed on the driving experience of 8 drivers (in years)

Answer the following questions.

i. Does the insurance premium depend on the driving experience or does the driving experience depend on the insurance premium?

ii. What is the regression equation?

iii. What can you conclude about the estimated intercept?

iv. What is the interpretation of the slope of regression line?

v. What is R^2 vlaue?

vi. What is the interpretation of R^2?

vii. Predict the monthly insurance premium for a driver with 10 years of driving experience.

viii. What type of a relationship is in between two variables? (Positive or negative)

ix. What is the standard deviation of errors?

x. What are the confidence intervals for the independent variable?

(2 marks for each)

(Total 20 Marks)

(07) a) A manager claims average sales for his shop is Rs. 18000 a day during the month of December. 10 days of December selected at random; and the mean of the sales is Rs. 18300. The standard deviation of the population is Rs. 2000.

(Assume the variable is normally distributed)

(i) Find the 95% confidence interval of the mean.

(04 marks)

(ii) Does the confidence interval interpretation agree with the hypothesis test results? Explain.

(04 marks)

b) A coin was tossed 60 times and came up heads 38 times.

(i) State the null and alternative hypotheses for the above situation.

(04 marks)

(ii) Calculate a P - value and interpret it.

(04 marks)

(iii) Perform the hypothesis test at the 0.10 (α) level of significance, using a P - Value approach. Interpret your answer.

(04 marks)

(Total 20 Marks)

(08) a) Two salesmen, A and B are working in a certain district. From a sample survey conducted by the Head office, the following results were obtained. ($\alpha = 0.01$)

	A	B
No. of sales	20	18
Average sales (in 10,000 Rs.)	170	205
Standard Deviation (in 1000 Rs)	20	25

State whether there is a significant difference in the average sales of the two salesmen; by using hypothesis testing.

(12 marks)

b) (i) What do you mean by the analysis of time series? What is its significance?

(04 marks)

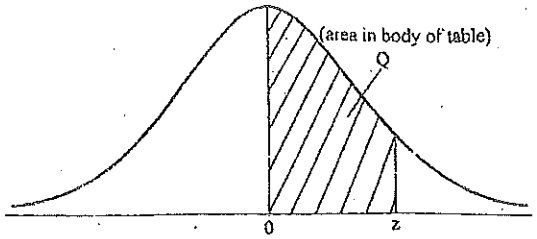
(ii) Describe the various components of a time series.

(04 marks)

(Total 20 Marks)

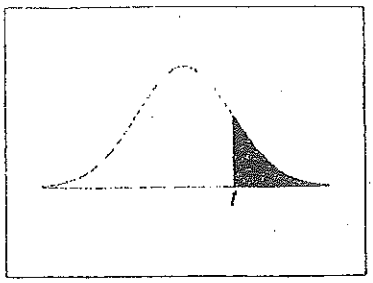
Table 1

AREAS UNDER THE STANDARD NORMAL CURVE



z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998

t-Distribution Table



The shaded area is equal to α for $t = t_\alpha$.

df	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$
1	3.078	6.314	12.706	31.821	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.492	2.797
25	1.316	1.708	2.060	2.485	2.787
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
32	1.309	1.694	2.037	2.449	2.738
34	1.307	1.691	2.032	2.441	2.728
36	1.306	1.688	2.028	2.434	2.719
38	1.304	1.686	2.024	2.429	2.712
∞	1.282	1.645	1.960	2.326	2.576

Gilles Cazelais. Typeset with LaTeX on April 20, 2006.