



Bachelor of Business Management(General)Degree
Second Examination (External) - 2007

BMGT E 2045 – Statistics for Management

No. of Questions: 08

Time: 03 hours

Answer any five (05) questions.

- (1) (a) i. What is Statistics?
ii. Bring out clearly the importance of statistical methods to business?
(08 marks)
- (b) What is a random variable?
What are the main types of random variables?
(04 marks)
- (c) i. Distinguish between a population and a sample.
ii. State the various types of samples. Explain.
(08 marks)
- (2) (a) The following table gives the monthly expenditure of two families, A and B on different items.

Item of Expenditure	Family A	Family B
	(income Rs. 30,000)	(income Rs. 50,000)
	Rs.	Rs.
1. Food	8400	15000
2. Clothing	4800	10000
3. House Rent	7500	10000
4. Fuel and lighting	3000	4000
5. Education	3000	4000
6. Savings	2100	3000
7. Others	1200	4000

- i. Construct an appropriate graphical display for the information.
ii. Write short summary of findings related to graphical display.
(10 marks)

(b) Following figures relate to the size of capital of companies, in particular area.

Capital (in million)	Number of companies
1 - 5	20
6 - 10	27
11 - 15	29
16 - 20	38
21 - 25	48
26 - 30	53
31 - 35	70

- i. Find out the median size of the capital.
- ii. What is the coefficient of skewness?
- iii. What conclusions do you draw, from the skewness measured by you?

(10 marks)

(3) (a) Define the following terms.

- i. Mutually exclusive events
- ii. Independent events
- iii. Compound events
- iv. Sample Space.

(4 marks)

(b) In a factory similar machines, A,B, and C are used. Out of the total output, 25% , 35% and 40% of the items are produced by machines A, B, and C respectively. It is found that the machines A,B and C produce 5%, 4% and 2% defective items respectively in their productions. An item is selected at random and is found to be defective. Find the probability that the item was manufactured by machine B.

(08 marks)

(c) The average percentage of failures in a certain examination is 60. What is the probability that out of a 10 candidates, at least 3 passed in the examination.

(08 marks)

(4) "Star" company produces 2000 electric bulbs with a mean life of 900 hours and a standard deviation of 150 hours. Company is seeking to improve its quality, company director needs answers for the following problems.

You are required to answer,

- i. How many bulbs will fail between 600 and 1100 hours?

- ii. After what number of hours would you expect that, 5% of the bulbs would fail?
- iii. After what number of hours would you expect that, 500 bulbs are in good condition?

(20 marks)

- (5) (a) Distinguish between “correlation” and “regression” as concepts used in statistical analysis.

(04 marks)

- (b) Suppose that you have been given the following data related to bonus payments made by a company for the year 2006 and output for the year 2007.

2006	2007
Bonus (Rs 10,000)	Output(units)
10	45
8	38
6	35
8	37
6	36
9	40
7	37

- i. Draw a regression line to examine the correlation between the variables.
- ii. Calculate the coefficient of correlation.
- iii. Calculate the coefficient of determination.
- iv. Interpret your above results.

(16 marks)

- (6) (a) If the ages of children in a primary school are normally distributed with mean 10 years and standard deviation 2 years. If a random sample 25 children is taken, what is the probability that the mean age of the children is between 10 and 12 years?

(10 marks)

- (b) A random sample of 40 customers of a bank revealed that the average amount of deposit by customers in one of its branches was Rs. 4500, with a standard deviation of Rs. 1500. Estimate at 95% level of confidence interval, the average amount of deposit by all the customers of the bank.

(10 marks)

- (7) (a) i. What is meant by a null –hypothesis?
 ii. How is it different from an alternative –hypothesis?

(05 marks)

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(05 marks)

(b) A potential buyer of electric bulbs bought 100 bulbs of two famous brands, X and Y . Upon testing these, he found that brand X had a mean life of 1500 hours with a standard deviation 50 hours, whereas brand Y had an average life of 1530, hours with standard deviation of 60 hours. Can it be concluded at 5% level of significance that the two brands differ significantly in quality?

(15 marks)

(8) A soap manufacture is trying to determine whether or not to market a new type of soap. It chooses a random sample of 300 people in Matara, Colombo, and Kandy district. He asked each of the people in each sample to try the new soap, and see whether they like it better than other soaps. The results are as follows.

	Matara	Colombo	Kandy
Prefer new soap	81	43	26
Do not prefer new soap	219	257	274

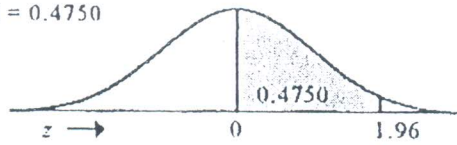
Does it appear that there are differences between the districts in proportion of people who prefer the new soap? (Use, level of significance .05)

(20 marks)

APPENDIX: STATISTICAL TABLES

AREAS UNDER THE NORMAL CURVE

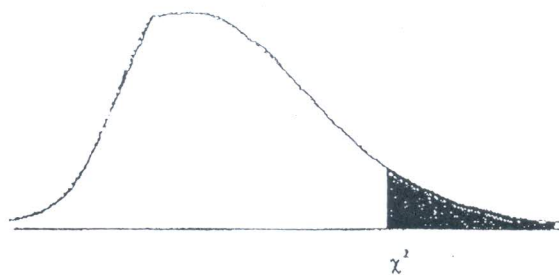
Example
If $z = 1.96$, then
 $P(0 \text{ to } z) = 0.4750$



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	0.4235	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

CRITICAL VALUES OF CHI-SQUARE

This table contains the values of χ^2 that correspond to a specific right-tail area and specific numbers of degrees of freedom df .



Possible values of χ^2

Degrees of Freedom <i>df</i>	Righ-tail Area			
	0.10	0.05	0.02	0.01
1	2.706	3.841	5.412	6.635
2	4.605	5.991	7.824	9.210
3	6.251	7.815	9.837	11.345
4	7.779	9.488	11.668	13.277
5	9.236	11.070	13.388	15.086
6	10.645	12.592	15.033	16.812
7	12.017	14.067	16.622	18.475
8	13.362	15.507	18.168	20.090
9	14.684	16.919	19.679	21.666
10	15.987	18.307	21.161	23.209
11	17.275	19.675	22.618	24.725
12	18.549	21.026	24.054	26.217
13	19.812	22.362	25.472	27.688
14	21.064	23.685	26.873	29.141
15	22.307	24.996	28.259	30.578
16	23.542	26.296	29.633	32.000
17	24.769	27.587	30.995	33.409
18	25.989	28.869	32.346	34.805
19	27.204	30.144	33.687	36.191
20	28.412	31.410	35.020	37.566
21	29.615	32.671	36.343	38.932
22	30.813	33.924	37.659	40.289
23	32.007	35.172	38.968	41.638
24	33.196	36.415	40.270	42.980
25	34.382	37.652	41.566	44.314
26	35.563	38.885	42.856	45.642
27	36.741	40.113	44.140	46.963
28	37.916	41.337	45.419	48.278
29	39.087	42.557	46.693	49.588
30	40.256	43.773	47.962	50.892