Eastern University, Sri Lanka

Faculty of Commerce and Management

Special Repeat Examinations in Bachelor of Business Administration and Bachelor of Commerce 2009/2010 (December 2011)

DAF 3134 Business Statistics

Answer All Questions

Time: 03 Hours

Calculators are permitted

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01. (I). The following information summarizes number of students enrolled in different study programme in a private college as shown below.

Study Programme	Number of Students
Management	125
Accounting	150
Marketing	60
Finance	90
Entrepreneurship	70
Other	30

Shows the above data using pie chart and bar chart. **(05 Marks)**

(II). Following data shows average monthly sales of 100 small scale Grocery shops in the Batticaloa District. The data were collected as a sample for the research purpose.

Sales in Rs. ('000')	Below 20	20 - <40	40 -<60	60 -<80	80 -<100	Above 100
No.of Shops	10	37	20	16	10	7

a. Draw histogram.

b. Find the following Measures:

i. Mean; ii. Median;

iii. Mode; iv. Standard deviation.

c. Find skewness of the distribution and describe it.

d. Find coefficient of variation and interpret it. **(15 Marks)**

(IV). The following statistics show the income levels of two villages.

Villages	Average Income (Rs.)	Standard Deviation (Rs
X	5750	700
Y	9800	1000

a. Find the coefficient of variation of two villages.

b. Which village people income is more consistent?

(05 Ma

(Total Marks: 25 Ma

02. (I). From the company records of the past 100 working days, the manager of an mobile dealership has summarised the number of cars sold per day into the follo probability distribution.

Number of cars sold	0	1	2	3	4	5	6
Probability (P_x)	0.02	0.15	0.27	0.20	0.15	0.15	0.06

a. Compute mean or expected number of cars sold per day.

b. Compute the standard deviation of cars sold per day.

c. Find the probability on given day that:

1. fewer than 4 cars sold per day;
2. at least 4 cars sold per day;
3. exactly 4 cars sold per day.

(07 Ma

(II). Leakage from underground petrol tanks at service stations can damage environment. It is estimated that 30% of these tanks leak. 10 tanks are chose random, independently of each other, and examined.

a. What is the probability that fewer than three tanks leak?

b. What is the probability that at least nine tanks leak?

c. What is the expected number of leaking tanks?

(07 Ma

(III). A box consists of 10 black colour balls and 5 white colour balls. After shaking box well, two balls were taken randomly without replacement. Find the probabilit the following:

a. two white balls;

b. at least one black ball;

c. getting ball first time black colour and second time white colour.

(06 Ma

(Total Marks: 20 Ma

03. (I). A statistical analysis of long-distance telephone calls made from the headquarters of the Airtone Computer Corporation indicates that the length of these calls is normally distributed with mean $\mu = 240$ seconds and standard deviation $\sigma = 40$ seconds.

a. What percentage of these calls lasted less than 180 seconds?

b. What is the probability that a particular call lasted between 180 and 300 seconds?

c. What is the probability that a particular call lasted above 260 seconds?

d. What is the probability that at least the telephone call duration is 200 seconds?

e. If random samples of 100 telephone calls are selected, what is the probability that the average length of calls will be more than 250 seconds? **(09 Marks)**

(II). A stationery store manager wants to estimate the mean retail value of greeting cards that it has in its inventory. A random sample of 36 greeting cards indicates an average value of 167 and a standard deviation of 30. Assuming data are normallydistributed. Set up a 95% confidence interval estimate of the mean value of all greeting cards in the store's inventory. **(06 Marks)**

(Total Marks: 15 Marks)

04. (I). Explain the meaning of independent and dependent variable with examples? **(05 Marks)**

(II). The following data gives the details of advertisement expenditure and sales of 10 companies in Sri Lanka.

Advertisement Expenditure (Rs. Million)	Sales (Rs. Billion)
3	7
2	5
5	6
6	8
4	5
7	6
5	7
8	9
9	9
7	8

a. Draw scatter plot.

b. Find coefficient of correlation and interpret it.

c. Find coefficient of determinant and interpret it.

d. Develop a regression model in an attempt to predict sales of a company by amount of advertisement expenditure **(15 Marks)**

(Total Marks: 20 Marks)

05. (I). Briefly explain the components of time series analysis. (0

(II). The following table gives the quarterly sales units of a small company over years.

Year	Sales of Umbrella ('000' Units)			
	Q 1	Q 2	Q 3	Q 4
2008	24.8	36.3	38.1	47.5
2009	31.2	42.0	43.4	55.9
2010	40.0	48.8	54.0	69.1
2011	54.7	57.8	60.3	68.9

You are required to:

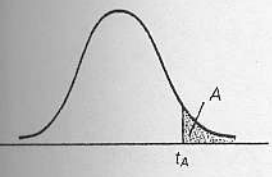
a. Calculate the trend for the sales of umbrella as a centred four-point moving average. (08 M

b. Evaluate the seasonal component for each quarters based on the moving a trend obtained in part (a), assuming the multiplicative model. (04 M

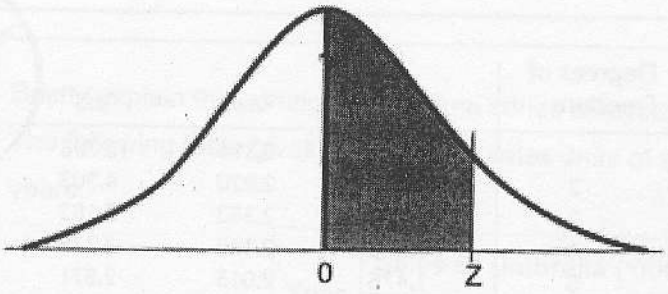
c. Forecast the sales of umbrella for the four quarters of 2012 using trend forec of 66.7, 68.8, 70.9 and 73. (03 Ma

(Total Marks: 20 M

TABLE **4**
Critical Values of the Student *t* Distribution



Degrees of Freedom	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$
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
35	1.306	1.690	2.030	2.438	2.724
40	1.303	1.684	2.021	2.423	2.704
45	1.301	1.679	2.014	2.412	2.690
50	1.299	1.676	2.009	2.403	2.678
55	1.297	1.673	2.004	2.396	2.668
60	1.296	1.671	2.000	2.390	2.660
65	1.295	1.669	1.997	2.385	2.654
70	1.294	1.667	1.994	2.381	2.648
75	1.293	1.665	1.992	2.377	2.643
80	1.292	1.664	1.990	2.374	2.639
85	1.292	1.663	1.988	2.371	2.635
90	1.291	1.662	1.987	2.368	2.632
95	1.291	1.661	1.985	2.366	2.629
100	1.290	1.660	1.984	2.364	2.626
110	1.289	1.659	1.982	2.361	2.621
120	1.289	1.658	1.980	2.358	2.617
130	1.288	1.657	1.978	2.355	2.614
140	1.288	1.656	1.977	2.353	2.611
150	1.287	1.655	1.976	2.351	2.609
160	1.287	1.654	1.975	2.350	2.607
170	1.287	1.654	1.974	2.348	2.605
180	1.286	1.653	1.973	2.347	2.603
190	1.286	1.653	1.973	2.346	2.602
200	1.286	1.653	1.972	2.345	2.601
∞	1.282	1.645	1.960	2.326	2.576



This table presents the area between the mean and the Z score . When Z=1.96, the shaded area is 0.4750.

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	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990
3.1	.4990	.4991	.4991	.4991	.4992	.4992	.4992	.4992	.4993	.4993
3.2	.4993	.4993	.4994	.4994	.4994	.4994	.4994	.4995	.4995	.4995
3.3	.4995	.4995	.4995	.4996	.4996	.4996	.4996	.4996	.4996	.4997
3.4	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4998
3.6	.4998	.4998	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.9	.5000									

Source: Adapted by permission from *Statistical Methods* by George W. Snedecor and William G. Cochran, sixth edition