LIBRARY

Uva Wellassa University

Faculty of Management

Degree of Bachelor of Business Management and Entrepreneurship

Year 2 Semester II Examination - June 2008

EMG 242-4 Statistical Methods

C: Essay Questions

Answer Any Five (5) Questions
Time: One (1.00) hour and 30 minutes (Suggested)
Total marks 50

1. A company employing 10,000 workers offers deluxe medical coverage (D), standard medical coverage (S) and economy medical coverage (E) to its employees. Of the employees, 30% have D, 60% have S and 10% have E. From past experience, the probability that an employee with D, will submit no claims during next year is 0.1. The corresponding probabilities for employees with S and E are 0.4 and 0.7 respectively. If an employee is selected at random;

   a) What is the probability that the selected employee has standard coverage and will submit no claim during next year?
   b) What is the probability that the selected employee will submit no claim during next year?
   c) If the selected employee submits no claims during the next year, what is the probability that the employee has standard medical coverage (S)?

2. A company utilizes different types of raw materials for the manufacture of its products. The number of units of each raw material used and the cost for two years are shown below:

Item	2003		2007	
	Quantity	Price per Unit	Quantity	Price per Unit
A	450	120	550	130
B	800	90	700	100
C	900	60	1000	68
D	750	67	800	80

   a) Calculate the LASPEYRE'S price index and PAASHE'S price index for the year 2007, using 2003 as a base year. Comment on it.
   b) Explain why LASPEYRE'S price index numbers are usually greater than their PAASHE'S equivalents.
   c) Explain the main disadvantage in using expenditure index.

3. A financial analyst is interested in computing the turnover rates, in percent, for shares of oil- related stocks versus other stocks, such as GE and IBM. She selected 32 oil-related stocks and 49 other stocks. The mean turnover rate of oil-related stocks is 31.4 percent and the standard deviation 5.1 percent. For the other stocks, the mean rate was computed to be 34.9 percent and the standard deviation 6.7 percent. The financial analyst is interested in testing whether there is significant difference in the turnover rates of the two types of stock.

   a) Is this a one-tailed or a two-tailed test?
   b) Using the 0.01 level of significance, what is the decision rule?
   c) Determine the value of the test statistic, and arrive at a decision regarding H_0. Explain the meaning of your decision.

4. a). An investigator is contemplating to invest either in bonds that will pay 9 percent interest or in stock. The stock prices may go up by 20 % or decrease by 10%, remain unchanged. The probabilities of these three occurrences were found by investor as 0.3, 0.2 and 0.5 respectively. If the investor has initial capital of Rs. 1000, what should he do?

   b). A simple random sample of 16 radio stations is selected in order to estimate the average charge for the same fixed-Length spot announcement. The sample mean and standard deviation are Rs. 15.50 and Rs.8 respectively. Assume that the charges made by all radio stations, of the type of stations sampled are approximately normally distributed. Construct the 95% C.I. for the population mean and comment on it.

5. A television manufacturing company has been selling 1000 televisions a week at Rs. 45000 each. A market survey indicates that for each 1000 rebate offered to buyer, the number of televisions sold will increase by 100 per week.

   a) Derive a relationship between price of television (p) and number of televisions (x) sold in a week to the buyer. Express p as a function of x.

   b) Write revenue function in terms of x.

   c) If its weekly cost function is C(x) =6800000+15000x, how should the manufacture set the price of television in order to maximize its profit?

   d) What is that maximum profit for month that company can get under current situation?

   e) What is the amount of money saved by buyer in purchasing televisions at price obtained by part (c)?

6. A company is considering either to buy a computer for Rs. 90000 or hire it for 5 years at Rs. 3000 per month. Assume that money is worth 12% compounded monthly and the lifetime of computer is five years. But after five years the computer can be sold for Rs. 20000 to a computer repairing shop.

   a) Find present value (principal value) of Rs. 20000 which is to be received at the end of five years.

   b) Using part a) find the present value of actual cost of buying computer.

   c) Find the present value of leasing computer.

   d) Comparing part b) and c) decide, should the company buy or hire the computer.

   e) Suppose the company maintenance contract for the computer is Rs. 1000 per month, what is the present value of the maintenance contract?

(Marks 5 x 10 = 50 marks)

Formulas

Annuity Immediate

$$S_n = \frac{R}{i}[(1+i)^n - 1]$$

$$a_n = R\left[\frac{(1+i)^n - 1}{i(1+i)^n}\right]$$

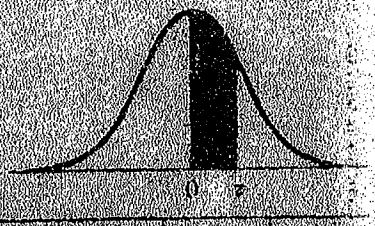
Annuity Due

$$\ddot{S}_n = \frac{R(1+i)}{i}[(1+i)^n - 1]$$

$$\ddot{a}_n = \frac{R}{i}\left[\frac{(1+i)^n - 1}{(1+i)^{n-1}}\right]$$

Table 3: AREA OF A STANDARD NORMAL DISTRIBUTION

An entry in the table is the proportion under the entire curve which is between $z = 0$ and a positive value of z. Areas for negative values of z are obtained by symmetry



z	00	01	02	03	04	05	06	07	08	09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.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	.2703	.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	.3366	.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