THE OPEN UNIVERSITY OF SRI LANKA
BACHELOR OF MANAGEMENT STUDIES – LEVEL 5
ASSIGNMENT TEST 2006
QUANTITATIVE TECHNIQUES FOR MANAGEMENT – MCU 3209
DURATION : TWO (02) HOURS

DATE : 06. 05. 2006 TIME : 10 a.m – 12.00 noon

ANSWER ANY FOUR QUESTIONS
(Standard normal distribution tables are provided)
Non- programmable calculators are allowed.

1) a) State the properties of the normal distribution.

b) A sportsman observes that the time he takes to complete the 100 meter sprint event is normally distributed with mean 11 seconds and standard deviation 1.2 seconds. If the Sri Lanka record for this event is 9.8 seconds and the Asia games record is 9.2 seconds.

(i) What is the probability that he will break the Sri Lanka record?
(ii) What is the probability that he will break the Asia games record?

2) a) Give three examples of variables related to your work that are normally distributed.

b) The life time of an electric bulb is observed to be normally distributed with mean 800 hours and standard deviation 120 hours.

(i) What is the probability that a bulb lasts at least 400 hours.
(ii) What is the probability that the bulb last for less than 950 hours.
(iii) A building is housed with 1000 such bulbs all installed on the same day. If a bulb operates only 4 hours a day how many bulbs will have to be replaced after 180 days.

3) a) Evaluate the expression ${}^{n}C_{r}p^{r}q^{(n-r)}$ when n = 8, r = 5 and p = 0.2

b) Chocolates are packed in boxes and jars, while a box contains 6 chocolates a jar contains 50 chocolates. The probability that any one of the chocolates are spoilt is 0.2.

(i) What is the probability that exactly 2 chocolates in a box are spoilt.
(ii) What is the probability that less than 2 chocolates in a box are spoilt.
(iii) What is the probability that less than 20 chocolates in a jar are spoilt.

4) a) Evaluate the expression $\frac{e^{-a}a^{x}}{x!}$ when a = 2, x = 3 and e = 2.71

b) At a barber shop on the average 3 customers arrive every hour.

(i) What is the probability that exactly 2 customers will arrive the next hour.

(ii) What is the probability that exactly 4 customers will arrive the next hour.

(iii) What is the probability that no customer will arrive the next hour.

(iv) What is the probability that at least one customer will arrive the next hour.

5) An organization decided to estimate the daily expenditure on fuel because of recent hike in fuel price. A random sample of 49 days selected revealed that the mean and standard deviation of the daily expenditure on fuel were Rs. 700,000 and Rs.65,000 respectively.

(i) Develop a 95% confidence interval estimate of the daily expenditure on fuel.

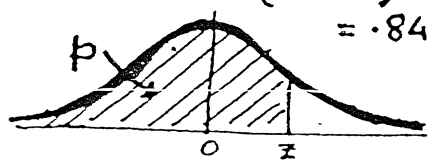
(ii) Develop a 80% confidence interval estimate on the daily expenditure on fuel.

6) Write short notes on the following

a) Null hypothesis
b) Type (1) error
c) Critical Region
d) Level of significance of test
e) Unbias sample

P(z = 1.01) = .843752

Standard normal distribution



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.500000	.503989	.507978	.511966	.515953	.519939	.523922	.527903	.531881	.535856
0.1	.539828	.543795	.547758	.551717	.555670	.559618	.563559	.567495	.571424	.575345
0.2	.579260	.583166	.587064	.590954	.594835	.598706	.602568	.606420	.610261	.614092
0.3	.617911	.621720	.625516	.629300	.633072	.636831	.640576	.644309	.648027	.651732
0.4	.655422	.659097	.662757	.666402	.670031	.673645	.677242	.680822	.684386	.687933
0.5	.691462	.694974	.698468	.701944	.705401	.708840	.712260	.715661	.719043	.722405
0.6	.725747	.729069	.732371	.735653	.738914	.742154	.745373	.748571	.751748	.754903
0.7	.758036	.761148	.764238	.767305	.770350	.773373	.776373	.779350	.782305	.785236
0.8	.788145	.791030	.793892	.796731	.799546	.802337	.805105	.807850	.810570	.813267
0.9	.815940	.818589	.821214	.823814	.826391	.828944	.831472	.833977	.836457	.838913
1.0	.841345	.843752	.846136	.848495	.850830	.853141	.855428	.857690	.859929	.862143
1.1	.864334	.866500	.868643	.870762	.872857	.874928	.876976	.879000	.881000	.882977
1.2	.884930	.886861	.888768	.890651	.892512	.894350	.896165	.897958	.899727	.901475
1.3	.903200	.904902	.906582	.908241	.909877	.911492	.913085	.914657	.916207	.917736
1.4	.919243	.920730	.922196	.923641	.925066	.926471	.927855	.929219	.930563	.931888
1.5	.933193	.934478	.935745	.936992	.938220	.939429	.940620	.941792	.942947	.944083
1.6	.945201	.946301	.947384	.948449	.949497	.950529	.951543	.952540	.953521	.954486
1.7	.955435	.956367	.957284	.958185	.959070	.959941	.960796	.961636	.962462	.963273
1.8	.964070	.964852	.965620	.966375	.967116	.967843	.968557	.969258	.969946	.970621
1.9	.971283	.971933	.972571	.973197	.973810	.974412	.975002	.975581	.976148	.976705
2.0	.977250	.977784	.978308	.978822	.979325	.979818	.980301	.980774	.981237	.981691
2.1	.982136	.982571	.982997	.983414	.983823	.984222	.984614	.984997	.985371	.985738
2.2	.986097	.986447	.986791	.987126	.987455	.987776	.988089	.988396	.988696	.988989
2.3	.989276	.989556	.989830	.990097	.990358	.990613	.990863	.991106	.991344	.991576
2.4	.991802	.992024	.992240	.992451	.992656	.992857	.993053	.993244	.993431	.993613
2.5	.993790	.993963	.994132	.994297	.994457	.994614	.994766	.994915	.995060	.995201
2.6	.995339	.995473	.995604	.995731	.995855	.995975	.996093	.996207	.996319	.996427
2.7	.996533	.996636	.996736	.996833	.996928	.997020	.997110	.997197	.997282	.997365
2.8	.997445	.997523	.997599	.997673	.997744	.997814	.997882	.997948	.998012	.998074
2.9	.998134	.998193	.998250	.998305	.998359	.998411	.998462	.998511	.998559	.998605