This question paper contains 2 printed pages

Roll No ...04...Anjali...

Master of Computer Applications (MCA) / I Semester

Paper MCA 103 – STATISTICAL TECHNIQUES
Minor Examination, September, 2017
Department of Computer Science, University of Delhi

Time: 1 Hour **Maximum Marks: 20**

(Write your Roll No. on the top immediately on receipt of this Question paper)
Attempt **all** questions. All parts of a question must be answered together.
Use of Scientific Calculator is allowed (4 decimal places). Mobile Phones are prohibited.

Q1. Consider the following dataset.

Height (cm.)	Frequency
144.55-149.55	1
149.55-154.55	3
154.55-159.55	24
159.55-164.55	58
164.55-169.55	60
169.55-174.55	27
174.55-179.55	2
179.55-184.55	2

(a) Find the Skewness of the data and comment on it. **3+1**
(b) Find the Quartile Deviation of the data **3**

Q2. In a certain state, 25% of all the cars emit excessive amounts of pollutants. If the probability is 0.99 that a car emitting excessive amounts of pollutants will fail the state's vehicular emission test, and the probability is 0.17 that a car not emitting excessive amounts of pollutants will nevertheless fail the test, what is the probability that a car that fails the test actually emits excessive amounts of pollutants? **2**

Q3. Derive the Mean and Variance of a random variable X having the normal distribution. **3**

Q4. Record show that the probability is 0.0012 that a person will get food poisoning spending a day at a certain state fair. Use the Poisson approximation to the binomial distribution to find the probability that among 1000 persons attending the fair, at most two will get food poisoning. **2**

1+2
1+2
+2

Q5. If the trivariate probability density of X_1, X_2 and X_3 is given by 2

$$f(x_1,x_2,x_3) = \begin{cases} (x_1+x_2)e^{-x3} & \text{for } 0<x1<1,\ 0<x2<1,\ x3>0 \\ 0 & \text{elsewhere} \end{cases}$$

Find P [(X_1, X_2 and X_3) $\in$ A], where A is the region $\{ (x_1,x_2,x_3) \mid 0<x_1<0.5,\ 0.5<x_2<1,\ x_3<1 \}$

Q6. A certain lottery works by picking 6 numbers from 1 to 49. It costs \$1.00 to play the lottery, and if you win, you win \$2 million after taxes. If you play the lottery every week for 10 years, what are your expected winnings or losses? 2

Q7. Suppose that the average total first innings ODI score of Indian cricket team is Normally Distributed with mean 350 runs and standard deviation 50 runs. What is the probability that while batting first in an upcoming ODI cricket match, India scores less than 310 runs? 2
(Consider the following table for relevant calculations)

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767