This question paper contains 4 printed pages +1 Page Table Attached]

Your Roll No. .....

4314

B.A. (Prog.)/III **G-II**

Paper Code : C-804

APPLICATION COURSE : BASIC STATISTICS

Time : 3 *Hours* *Maximum Marks* : 100

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. **1** is compulsory.

Attempt any *four* questions from

Question No. **2** to **7**, selecting at least *one*

question from each of the Sections I, II and III.

Give full explanation for each question.

Marks are indicated against each question.

Use of Simple Calculator is allowed.

1. Short answers with proper justification are expected in all the *five* parts of this question. Each part is of **3** marks : 5×4=20

   (*i*) Discuss the skewness for the distribution in which :

   mean < median < mode.

   (*ii*) Find two regression equations from the following data :

	X	**Y**
Mean	3	85
Standard deviation	11	8
Correlation coefficient	0.66	

P.T.O.

(*iii*) A union wage negotiator feels that the probabilities are 0.40, 0.30, 0.20 and 0.10 that the union members will get Rs. 1.50, Rs. 1.00, Rs. 0.50 or no raise per hour. What is the expected raise ?

(*iv*) If the correlation coefficient between two random variables X and Y is zero, then what can you say about the independence of random variables ?

(*v*) In a random sample, 136 of 400 persons given a flu vaccine experienced some discomfort. Construct a 95% confidence interval for the true proportion of persons who will experience some discomfort from the vaccine.

Section I

2. Calculate the correlation coefficient for the following heights in inches of father, X and their sons, Y : 20

X	Y
65	67
66	68
67	65
67	68
68	72
69	72
70	69
72	71

3. You are given the position in a factory before and after the settlement of industrial dispute : 20

	Before dispute	After dispute
No. of workers	3000	2900
Mean Wages (Rs.)	220	230
Median Wages (Rs.)	250	240
Standard deviation	30	26

Compare the position before and after the dispute in respect of :

(*i*) Variability

(*ii*) Skewness

(*iii*) Modal wages.

Section II

4. The marks obtained in a certain examination follow the normal distribution with mean 45 and standard deviation 10. If 1000 students appeared at examination, calculate the number of students scoring : 20

(*i*) less than 40 marks

(*ii*) more than 60 marks

(*iii*) between 40 and 50 marks.

5. Records show that 30% of all patients admitted to a medical clinic fail to pay their dues and eventually their bills are forgiven. Suppose four patients represent a random selection from

the large set of prospective patients served by the clinic. Find the probability that :

(*i*) all patient's bills will eventually be forgiven

(*ii*) at least one patient bill will be forgiven. 20

Section III

6. The mean life time of sample of 100 fluorescent light tubes produced by a company is computed to be 1570 hours with a standard deviation of 120 hours. The company claims that the average life of the tubes produced by the company is 1600 hours. Using the level of significance of 0.05, is the claim acceptable ? 20

(Given that : $Z_{0.05} = \pm 1.96$, $Z_{0.01} = \pm 2.58$, $Z_{0.05} = 1.65$, $Z_{0.01} = 2.33$)

7. The following are the numbers which a random sample of nine salesmen of industrial chemicals in a city and a random sample of six salesmen of industrial chemicals in another city made over a fixed period of time :

City 1 : 41, 47, 62, 39, 56, 64, 37, 61, 52

City 2 : 34, 63, 45, 55, 24, 43

Use the 0.01 level of significance to test whether the difference between the means of these two samples is significant. 20

(Given : $t_{0.01,\ 14} = 2.624$, $t_{0.01,\ 15} = 2.602$, $t_{0.01,\ 13} = 2.650$, $t_{0.005,\ 13} = 3.012$)

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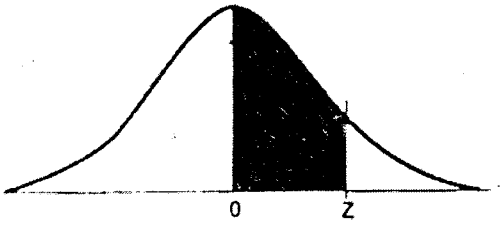

This table presents the area between the mean and the Z score . When Z=1.96, the shaded area is 0.4750 .

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									