

Seat No. \_\_\_\_\_

**GANPAT UNIVERSITY**  
**B. Tech. Sem. III ( CE/IT) CBCS Regular Exam. Dec. – 2013**  
**Sub : ( 2IT305/2CE305) – Probability & Statistics**

**Time : 3 hrs**

**Total marks : 70**

- Instruction:** (1) All questions are compulsory.  
 (2) Write answer of each section in separate answer books  
 (3) Figures to the right indicate marks of questions

**Section – I**

**Que1**

**(12)**

- (A) Calculate the Probable error from the following series of marks secured by 10 students in a class test in subjects Mathematics and Statistics.

Marks in Maths	45	70	65	30	90	40	50	75	85	60
Marks in Stat.	35	90	70	40	95	40	60	80	80	50

- (B) Calculate the Spearman's Rank Correlation co – efficient between marks in Physics and marks in Mathematics from following data

Physics	35	23	47	17	10	43	9	6	28
Maths	30	33	45	23	8	49	12	4	31

**OR**

**Que1**

**(12)**

- (A) Define the Probability distributive function of Normal distribution and State it's Properties .  
 (B) Prove that the Arithmetic mean of the Regression co – efficient is greater than the Correlation co – efficient .

**Que2**

- (A) The Systolic and Diastolic blood pressure ( mm hg ) for eight patient in a hospital were as under . Find two Regression equations between them . Also estimate the Diastolic blood pressure of a patient when his Systolic blood pressure is 140 . **(05)**

Systolic BP	135	148	145	138	142	150	152	144
Diastolic BP	89	91	86	88	85	83	93	85

- (B) The probability that India wins a cricket test match against Pakistan is given to be  $\frac{1}{3}$ . **(06)**  
 If India and Pakistan play 3 test match, What is the probability that  
 (1) India will lose all the three test match and  
 (2) India will win at least three test match

**OR**



Que2

(A) Given the following data:

(05)

	X	Y
Arithmetic mean	36	85
Standard deviation	11	8

Correlation co-efficient between x and y = 0.66.

- (1) Find two Regression equation and
- (2) Estimate the value of x when y = 75.

(B) Assume that on the average one telephone number out of 15 called between 2 p.m. and 3 p.m. on weekdays is busy. What is the probability that if 6 randomly selected telephone numbers are called

- (1) Not more than Five will be busy and
- (2) At least Five of them will be busy.

(06)

Que3

(A) If 5% of the electric bulbs manufactured by a company are defective. Use Poisson distribution to find the probability that in a sample of 100 bulbs :

(12)

- (1) None is defective ;
- (2) 5 Bulbs will be defective and
- (3) Not more than three will be defective

(B) The average monthly sales of 5000 firms are normally distributed with mean Rs. 36000 and standard deviation Rs. 10,000. Find

- (1) The number of firms with sales over Rs. 40,000.
- (2) The percentage of firms with sales between Rs. 38,500 and Rs. 41,000.
- (3) The number of firms with sales between Rs. 30,000 and Rs. 40,000.

## Section – II

Que: 4

- (A) Discuss the various types of classification of data. [4]
- (B) In a certain examination, the average grade of all students in class A is 68.4 & that of all students in class B is 71.2. If the average of both combined class is 70, find the ratio of the number of the students in class A to the number in class B. [4]
- (C) Define Harmonic mean for Discrete frequency distribution & find it for given data. [4]

$x_i$	10	20	25	40	50
$f_i$	20	30	50	15	5

OR

Que: 4

- (A) Define the following terms with examples. [4]
- (1) Variables and its types. (2) Class boundaries & class intervals



- (B) Define Harmonic mean for Discrete frequency distribution & find it for given data. [4]

$x_i$	10	15	18	20	25
$f_i$	2	3	5	6	4

- (C) The average of weight of a group of 25 boys was calculated to be 78.4 kg. It was later discovered that one value misread as 69 instead of the correct value 96. find correct average. [4]

Que: 5

- (A) Calculate  $Q_1$ ,  $Q_2$ ,  $D_4$  and  $P_{90}$  for the following information. [6]

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
$f_i$	2	18	30	45	35	20	6	3

- (B) For given incomplete frequency distribution is given as follows. Given that  $M = 46$  and  $N = 229$  Determine the missing frequencies. [5]

Class	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
$f_i$	12	30	?	65	?	25	18

OR

Que: 5

- (A) Write a shornote on a different types of Partition Values. [5]
- (B) Find Mode by Using both methods (by formula & method of grouping) [6]

Class	0 – 7	7 – 14	14 – 21	21 – 28	28 – 35	35 – 42	42 – 49
$f_i$	19	25	36	72	51	43	28

Que: 6 Attempt any Two

- (A) In usual notation derive all three results for computing standard deviation. [6]
- (B) Calculate semi inter quartile range and its co – efficient for given information. [6]

Class	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30
$f_i$	4	6	8	12	7	2

- (C) (I) Find mean deviation about median for the following data. [6]

$x_i$	5	7	9	11	13	15	17
$f_i$	2	4	6	8	10	12	8

(II) If  $P(A) = \frac{1}{3}$ ,  $P(B') = \frac{1}{4}$  and  $P(A \cap B) = \frac{1}{6}$  then find  $P(A' \cap B')$ .

END OF PAPER



Areas under standard normal curve.

Z	0	1	2	3	4	5	6	7	8	9
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0754
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2258	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2518	0.2549
0.7	0.2580	0.2612	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2996	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4818
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998
3.6	0.4998	0.4998	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.7	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.8	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.9	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000