Seat No._____

GANPAT UNIVERSITY

B.TECH.SEM.III (CE/IT) EXAMINATION. Nov/Dec - 2011

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

Que-1 **(12)**

(a) Calculate the correlation co-efficient from the following data between The age of husband (H) and age of wife (W) .

H	23	27	28	29	30	31	33	35	36	39
W	18	22	23	24	25	26	28	29	30	32

(b) Calculate Probable error between income and expenditure from following data .

Income	18	65	19	14	30	19	27	30	25	21	35
Expenditure	43	38	16	26	23	27	11	20	16	19	97

OR

Que-1 **(12)**

(a) Calculate Sperman's rank correlationco-efficient between X and Y for following data

X	24	29	19	14	30	19	27	30	20	28	11
Y	37	35	16	26	23	27	19	20	16	11	21

(b) Show that If one of the regression co-efficients is greater than unity ; the other must be less than unity

Que-2

(a) From the following data between X and Y; Find two Regression equations between them. **(05)**

X	40	34	28	30	44	38	31
Y	32	39	26	30	38	34	28

Also find Y when X=22

(b) Suppose the height measurement H of 800 people are normally distributed with mean 66 cms. and standard deviation 5 cms. Find the numbers of people with height **(06)**

(1). Between 35 cms. and 40 cms.

(2). Grater than or equal to 28 cms.

OR

Que-2

(a) State Baye's theorem.In a bolt factory machines A,B and C manufacture 25% , 35% and 40% of the total product respectively. Of their output 5% , 4% and 2% respectively are defective bolts. A bolt is drawn at random from the product and is found to be defective.What is the probability that it was manufactured by machine A ? **(05)**

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(b) Given the following data: (06)

	X	Y
Arithmetic mean	48	62
Variance	24	53

Correlation co-efficient between x and y = 0.48.
Find (1) Two Regression equation and (2) Estimate the value of y when x =36.

Que-3

(a) 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 (12)

(1) Not more than 3 will be busy and

(2) At least 3 of them will be busy.

(b) 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

(1) None is defective

(2) Not more than 3 will be defective.

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Section – II

Question-4 **Attempt the following.** 12

(a) Make a frequency table having grades of wages with class-interval of Rs.2 each from the following data of daily wages received by 30 workers in a certain factory. Daily wages in rupees are:

14	16	16	14	22	13	15	24	12	23	14	20	17	21	22
18	18	19	20	17	16	15	11	12	21	20	17	18	19	23

(b) Define Classification. Explain (1) Qualitative classification and (2) Chronological classification of data with suitable example.

(c) Derive step deviation method to compute Mean. Using it compute mean of following data.

X	5	10	15	20	25	30	35	40	45	50
F	20	43	75	67	72	45	39	9	8	6

OR

Question-4

(a) Define Frequency distribution and explain grouped frequency distribution with appropriate example.

(b) Find the lower and upper quartiles for the following distribution.

Marks	No. of Students	Marks	No. of Students	Marks	No. of Students
0-4	10	12-16	7	24-26	4
4-8	12	16-20	5	26-28	6
8-12	18	20-24	8		

(c) The weight of 50 apples picked at random from a consignment are as follows:

106	107	76	82	109	93	187	195	123	125
111	99	86	70	126	68	130	129	139	119
115	128	100	186	84	99	113	204	111	141
136	123	90	115	98	110	78	90	107	81
131	76	84	104	110	80	118	82	107	115

Form grouped frequency table by dividing the variate range into intervals of equal width, each corresponding to 20 gms. in such a way that the mid-value of first class corresponds to 70 gms.

Question-5 **Attempt the following.** 12

(a) Find average marks of students from the distribution given in below.

Marks	No. of Students	Marks	No. of students
Above 0	80	Above 60	28
Above 10	77	Above 70	16
Above 20	72	Above 80	10
Above 30	65	Above 90	8
Above 40	55	Above 100	0
Above 50	43		

(b) From the distribution given below, find the median.

Monthly Rent (Rs.)	No. of families	Monthly Rent (Rs.)	No. of families
20-40	6	120-140	15
40-60	9	140-160	10
60-80	11	160-180	8
80-100	14	180-200	7
100-120	20		

(c) Using method of grouping, compute mode of the distribution.

X	4	5	6	7	8	9	10	11	12	13
F	2	5	8	9	12	14	14	15	11	13

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Question-5 **OR** 12

(a) Compute Quartile deviation and co-efficient of Quartile deviation of the following data.

X :	0-5	5-10	10-15	15-20	20-25	25-30
F :	4	6	8	12	7	2

(b) An incomplete distribution is given below. Given that the median value is 46.Calculate the missing frequencies

Variable	Frequency	Variable	Frequency
10-20	12	50-60	?
20-30	30	60-70	25
30-40	?	70-80	18
40-50	65	Total:	229

Also calculate the Arithmetic mean of the completed data.

(c) Calculate Mode of the following distribution

Marks.	1-5	6-10	11-15	16-20	21-25	26-30
No. of Students	7	10	16	32	24	18
Marks.	31-35	36-40	41-45			
No. of Students	10	5	1			

Question-6 **Attempt the following.**

(a) Calculate the missing frequency from the following data, given that median and mode of the distribution are Rs.25 and Rs.24 respectively. 4

Expenditure (in Rs.)	0-10	10-20	20-30	30-40	40-50
No. of family	14	?	27	?	15

(b) Find standard deviation for the following data giving the income of 230 persons per day: 4

Income (Rs.)	No. of workers	Income (Rs.)	No. of workers
20-30	12	70-80	50
30-40	18	80-90	45
40-50	35	90-100	20
60-70	42	100-110	8

(c) In usual notation prove that $s^2 + \sigma^2 = d^2$ 3

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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	0.1130	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

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