

GANPAT UNIVERSITY
B. Tech. Semester-III (CE/IT) CBCS Regular Examination Nov-2014
Subject: (2CE305 / 2IT305) Probability & Statistics

Time: 03 hours

Marks: 70

Instruction:

1. All questions are compulsory.
2. Write answer of each section in separate answer books.
3. Figure to the right indicate marks of questions.

SECTION - I**Question: 1**

- (A) Calculate correlation co-efficient and probable error from following data. [6]

x	0.2	0.7	0.9	1.3	1.8	2.2	2.6	2.9
y	0.3	0.4	0.8	1.1	1.6	1.9	2.4	2.7

- (B) Calculate rank correlation co-efficient from following data. [6]

x	48	33	40	9	16	16	65	24	16	57
y	13	13	24	6	15	4	20	9	6	19

OR

Question: 1

- (A) Derive Spearman's rank correlation coefficient for bivariate distribution. [6]

- (B) Prove that correlation co-efficient is independent of shift of origin & change of scale. [6]

Question: 2

- (A) Obtain two regression lines from following data. [6]

x	91	97	108	121	67	124	51	73	111	57
y	71	75	69	97	70	91	39	61	80	47

- (B) Define regression lines and derive the equation
- $x - \bar{x} = b_{xy}(y - \bar{y})$
- . [5]

OR

Question: 2

- (A) Prove that regression co-efficients are independent of shift of origin but not of scale. [6]

- (B) Two regression equations of variables
- x
- and
- y
- are;

$$x = 19.13 - 0.87y$$

$$y = 11.64 - 0.50x$$

Obtain (i) mean of x_i (ii) mean of y_i (iii) Correlation co-efficient. [5]

[P. T. O]

Question: 3 Attempt any two (each carry 6 marks)

[12]

(A) 10 unbiased coins are tossed simultaneously. Find the probability of getting
(i) 5 tails (ii) at least 7 tails (iii) one tail (iv) not more than 4 tails

(B) If $X \sim N(\mu = 2, \sigma^2 = 4)$ then evaluate following.

(i) $P(x \leq 2)$ (ii) $P(1 < x < 3)$ (iii) $P(-1.29 \leq x \leq 1.29)$

(C) If the probability of bad reaction from a certain injection is 0.001 determine the chance that out of 2000 individuals more than 2 will get bad reaction.

SECTION - II

Question: 4

(A) Define various types of classification of data.

[4]

(B) Calculate mean by using step deviation method for following data.

[4]

class	0-5	5-10	10-15	15-20	20-25	25-30	30-35
frequency	14	29	69	138	53	37	11

(C) Obtain mode for the given data.

[4]

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60	Below 70
students	13	33	58	72	84	92	3

OR

Question: 4

(A) Obtain Median and Quartiles for the given data.

[5]

class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	3	5	8	12	10	7	5

(B) Calculate Geometric mean and Harmonic mean for following data.

[5]

class	0-5	5-10	10-15	15-20	20-25
frequency	10	5	8	7	20

(C) Define Partition values.

[2]

Question: 5

(A) Obtain semi-inter quartile range and its co-efficient for following data.

[4]

Marks	3-5	5-7	7-9	9-11	11-13	13-15
No. of students	3	8	30	82	45	24

(B) Find mean deviation about median for following data.

[4]

x_i	58	59	60	61	62	63	64	65	66
f_i	1	20	32	35	33	22	20	10	8

(C) Define Standard deviation and prove that it is changed by change of scale.

[3]

OR

Question: 5

(A) Find Karl Pearson's co-efficient of skewness from given data.

[5]

15, 24, 24, 27, 30, 31, 33, 37, 40, 42, 42, 42, 43, 52, 57

(B) Calculate co-efficient variation from following data.

[6]

class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
frequency	5	10	20	40	30	20	10	4

Question: 6 Attempt any two (each carry 6 marks)

[12]

(A) (I) The mean wage of 200 workers working in a factory is Rs. 50. The mean wage of 75 workers of second shift is Rs. 60. Find the mean wage of rest.

(II) In usual notation derive $s^2 = \sigma^2 + d^2$

(B) Find mode using method of grouping then calculate mean deviation about mode.

x_i	1	2	3	4	5	6	7	8	9	10
f_i	3	8	15	23	35	40	32	28	20	45

(C) Find 7th decile and 82nd percentile from given data.

class	0-10	10-20	20-30	30-40	40-50
frequency	22	38	46	35	20

End of Paper

Areas under standard normal curve From 0 to z

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