

SVKM's NMIMS

NMIMS – GLOBAL ACCESS SCHOOL FOR CONTINUING EDUCATION

Programme: PGDBM/PGDITM/PGDSCM

Examination: June 2016  
Subject: Business Statistics

Semester: III  
Course : New  
Marks : 70  
Time: 3.00 p.m. to 6.00 p.m.

- Instructions :** 1) Candidates should read carefully the instructions printed on the questions paper and on the Cover of the answer-book which is provided for their use.  
2) Answer to each new question to be started on a fresh page.  
3) Figures in brackets indicate full marks.  
4) Required Statistical Tables attached.  
5) **Only simple, ordinary calculators to be used.** No other electronic devices, such as cell-phones, laptops, i-pads, etc., to be used.

**Q.1] Attempt any 2 (two) out of 4 (four) : (Marks : 2 X 5 = 10)**

- a) State the requisites of a good measure of central tendency. Give examples
- b) Explain the concept of skewness. Draw suitable graph
- c) Find mode for the following distribution :
- |                  |      |       |       |       |       |       |       |       |
|------------------|------|-------|-------|-------|-------|-------|-------|-------|
| Class-interval : | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
| Frequency :      | 5    | 8     | 7     | 12    | 28    | 20    | 10    | 10    |
- d) Find the probability that binomial variable takes value equal to zero given that mean and variance of the distribution are 4 and 3 respectively.

**Q.2] Write short notes on (any 2 (two) out of 5 (five)) (Marks : 2 x 5 = 10)**

- a) Absolute and relative measures of dispersion.
- b) Properties of Normal probability curve.
- c) Properties of Coefficient of Correlation
- d) Poisson distribution.
- e) Methods of collecting Primary and Secondary data.

Q.3]

Attempt any 3 (three) out of 5 (five)

(Marks : 3 X 10 = 30)

- a) Obtain Spearman's Rank correlation coefficient from the following data :

X : 10 12 18 18 15 40  
Y : 12 18 25 25 50 25

- b) A manufacturer knows from his past experience that the distribution of resistance of resistors he produces is approximately with mean 100 ohms and standard deviation 2 ohms. What percentage of resistors will have resistance (i) between 98 ohms and 102 ohms, (ii) less than 96 ohms, (iii) more than 103 ohms ?
- c) The incidence of an occupational disease in a large industry is such that the workers have 20% chance of suffering from it. What is the probability that out of 6 workers chosen at random, 4 or more will be suffering from the disease ?
- d) The mean and standard deviation for a group of 100 items is found to be 80 units and 15 units respectively. It was later observed that one observation was wrongly taken as 79 instead of 97. Find the correct mean and the correct standard deviation for the group.
- e) Two thirds of the students in a class are boys and the rest are girls. It is known that the probability that girl getting first class marks is 0.28 and that of boy getting first class marks is 0.25. Find the probability that a student chosen at random from the class (i) will get first class marks, (ii) is a girl student given that she will get the first class marks.

Q.4]

Attempt both the questions.

(Marks : 2 x 10 = 20)

- a) A Car hire firm has two cars which it hires out on daily basis. The number of cars demanded on each day is a Poisson variate with mean 1.5. Calculate the proportion of days on which (i) neither car is used, (ii) some demand is refused due to non-availability of cars.
- b) For the following data, calculate first quartile, fourth decile and seventy seventh percentile.

Marks in Statistics	No. of Students
20 - 25	21
25 - 30	19
30 - 35	50
35 - 40	40
40 - 45	16
45 - 50	20
50 - 55	10
55 - 60	10
60 - 65	5
65 - 70	9
<u>Total</u>	<u>200</u>

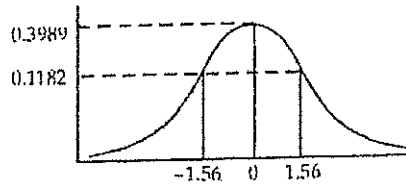
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# APPENDIX

## I. Binomial Coefficients

$n$	$\binom{n}{0}$	$\binom{n}{1}$	$\binom{n}{2}$	$\binom{n}{3}$	$\binom{n}{4}$	$\binom{n}{5}$	$\binom{n}{6}$	$\binom{n}{7}$	$\binom{n}{8}$	$\binom{n}{9}$	$\binom{n}{10}$	$\binom{n}{11}$
0	1											
1	1	1										
2	1	2	1									
3	1	3	3	1								
4	1	4	6	4	1							
5	1	5	10	10	5	1						
6	1	6	15	20	15	6	1					
7	1	7	21	35	35	21	7	1				
8	1	8	28	56	70	56	28	8	1			
9	1	9	36	84	126	126	84	36	9	1		
10	1	10	45	120	210	252	210	120	45	10	1	
11	1	11	55	165	330	462	462	330	165	55	11	
12	1	12	66	220	495	792	924	792	495	220	66	
13	1	13	78	286	715	1287	1716	1716	1287	715	286	
14	1	14	91	364	1001	2002	3003	3432	3005	2002	1001	
15	1	15	105	455	1365	3003	5005	6435	6435	5005	3003	
16	1	16	120	560	1820	4368	8008	11440	12870	11440	8008	
17	1	17	136	680	2380	6188	12376	19448	24310	24310	19448	
18	1	18	153	816	3060	8568	18564	31824	43758	48620	43758	
19	1	19	171	969	3876	11628	27132	50388	75582	92378	92378	
20	1	20	190	1140	4845	15504	38760	77520	125970	167960	1184759	

II. Ordinates of 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	.3989	.3989	.3989	.3988	.3986	.3984	.3982	.3980	.3977	.3973
0.1	.3970	.3965	.3961	.3956	.3951	.3945	.3939	.3932	.3925	.3918
0.2	.3910	.3902	.3894	.3885	.3876	.3867	.3857	.3847	.3836	.3825
0.3	.3814	.3802	.3790	.3778	.3765	.3752	.3739	.3725	.3712	.3697
0.4	.3683	.3668	.3653	.3637	.3621	.3605	.3589	.3572	.3555	.3538
0.5	.3521	.3503	.3485	.3467	.3448	.3429	.3410	.3391	.3372	.3352
0.6	.3332	.3312	.3292	.3271	.3251	.3230	.3209	.3187	.3166	.3144
0.7	.3123	.3101	.3079	.3056	.3034	.3011	.2989	.2966	.2943	.2920
0.8	.2897	.2874	.2850	.2827	.2802	.2780	.2756	.2732	.2709	.2685
0.9	.2661	.2637	.2613	.2589	.2565	.2541	.2516	.2492	.2468	.2444
1.0	.2420	.2396	.2371	.2347	.2323	.2299	.2275	.2251	.2227	.2203
1.1	.2179	.2155	.2131	.2107	.2083	.2059	.2036	.2012	.1989	.1965
1.2	.1942	.1919	.1895	.1872	.1849	.1826	.1804	.1781	.1758	.1736
1.3	.1714	.1691	.1669	.1647	.1626	.1604	.1582	.1561	.1539	.1518
1.4	.1497	.1476	.1456	.1435	.1415	.1394	.1374	.1354	.1334	.1315
1.5	.1295	.1276	.1257	.1238	.1219	.1200	.1182	.1163	.1145	.1127
1.6	.1109	.1092	.1074	.1057	.1040	.1023	.1006	.0989	.0973	.0957
1.7	.0940	.0925	.0909	.0893	.0878	.0863	.0848	.0833	.0818	.0804
1.8	.0790	.0775	.0761	.0748	.0734	.0721	.0707	.0694	.0681	.0669
1.9	.0656	.0644	.0632	.0620	.0608	.0596	.0584	.0573	.0562	.0551
2.0	.0540	.0529	.0519	.0508	.0498	.0488	.0478	.0468	.0459	.0449
2.1	.0440	.0431	.0422	.0413	.0404	.0396	.0387	.0379	.0371	.0363
2.2	.0355	.0347	.0339	.0332	.0325	.0317	.0310	.0303	.0297	.0290
2.3	.0283	.0277	.0270	.0264	.0258	.0252	.0246	.0241	.0235	.0229
2.4	.0224	.0219	.0213	.0208	.0203	.0198	.0194	.0189	.0184	.0180
2.5	.0175	.0171	.0167	.0163	.0158	.0154	.0151	.0147	.0143	.0139
2.6	.0136	.0132	.0129	.0126	.0122	.0119	.0116	.0113	.0110	.0107
2.7	.0104	.0101	.0099	.0096	.0093	.0091	.0088	.0086	.0084	.0081
2.8	.0079	.0077	.0075	.0073	.0071	.0069	.0067	.0065	.0063	.0061
2.9	.0060	.0058	.0056	.0055	.0053	.0051	.0050	.0048	.0047	.0046
3.0	.0044	.0043	.0042	.0040	.0039	.0038	.0037	.0036	.0035	.0034
3.1	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026	.0025	.0025
3.2	.0024	.0023	.0022	.0022	.0021	.0020	.0020	.0019	.0018	.0018
3.3	.0017	.0017	.0016	.0016	.0015	.0015	.0014	.0014	.0013	.0013
3.4	.0012	.0012	.0012	.0011	.0011	.0010	.0010	.0010	.0009	.0009
3.5	.0009	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0006
3.6	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0004
3.7	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
3.8	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002
3.9	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001

III. Areas under the Normal Curve

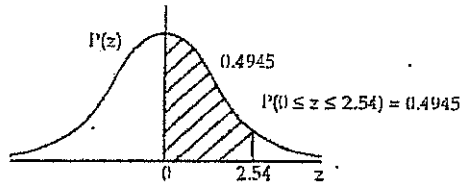


Table of Area

$z \rightarrow$	0	1	2	3	4	5	6	7	8	9
.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2223
.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2518	.2549
.7	.2580	.2612	.2642	.2673	.2703	.2734	.2764	.2794	.2823	.2852
.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
.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	.4849	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4965	.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	.4947	.4997	.4998
3.5	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4898	.4898
3.6	.4998	.4998	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.7	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.8	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.9	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000

TABLE OF VALUES OF  $e^{-m}$

m	$e^{-m}$	m	$e^{-m}$	m	$e^{-m}$
0.1	0.90484	1.1	0.33287	2.5	0.08208
0.2	0.81873	1.2	0.30119	3.0	0.04979
0.3	0.74082	1.3	0.27253	3.5	0.03020
0.4	0.67032	1.4	0.24660	4.0	0.01832
0.5	0.60653	1.5	0.22313	5.0	0.00674
0.6	0.54881	1.6	0.20190	6.0	0.00248
0.7	0.49659	1.7	0.18268	7.0	0.00091
0.8	0.44932	1.8	0.16530	8.0	0.00034
0.9	0.40657	1.9	0.14957	9.0	0.00012
1.0	0.36788	2.0	0.13534	10.0	0.000045