系所:<u>企業管理學系行銷與流通管理碩士班</u>

科目:統計學

共4頁,第1頁

☆☆請在答案紙上作答☆☆

I. Multiple Choices (50%)

1. If there are two unbiased estimators of a population parameter available, the one that has the smallest variance is said to be:

(A) a biased estimator. (B) relatively efficient. (C) consistent. (D) relatively unbiased

2. If A and B are any two events with P(A) = .8 and $P(B|A^c) = .7$, then $P(A^c \text{ and } B)$ is

(A) 0.56 (B) 0.14 (C) 1.50 (D) None of these choices.

3. A test is being conducted to test the differences between two population means using data that are gathered from a matched pairs experiment. If the paired differences are normal, then the distribution used for testing is the:

(A) normal distribution. (B) binomial distribution.

(C) Student t-distribution. (D) F-distribution.

4. The librarian at the Library of Congress has asked her assistant for an interval estimate of the mean number of books checked out each day. The assistant took a sample and found the mean to be 880 books. She provides the librarian with an interval estimate of between 790 and 970 books checked out per day. An efficient, unbiased point estimate of the number of books checked out each day at the Library of Congress is:

(A) 790 (B) 880 (C) 90 (D) None of these choices.

- 5. Given that X is a binomial random variable with very large n, the binomial probability $P(X \le 5)$ is approximated by the area under a normal curve to the left of (A) 5. (B) 5. (C) 5.5. (D) 4.5.
 - (A) 5 (B) 5 (C) 5.5 (D) 4.5
- 6. If the events A and B are independent with P(A) = 0.30 and P(B) = 0.40, then the probability that both events will occur simultaneously is:

(A) 0 (B) 0.12 (C) 0.70 (D) Not enough information to tell.

- 7. If X and Y are any random variables with E(X) = 5, E(Y) = 6, E(XY) = 21, V(X) = 9 and V(Y) = 10, then the relationship between X and Y is a:
 - (A) strong positive relationship (B) strong negative relationship
 - (C) weak positive relationship (D) weak negative relationship
- 8. If A and B are independent events with P(A) = 0.60 and P(A|B) = 0.60, then P(B) is:

(A) 1.20 (B) 0.60 (C) 0.36 (D) cannot be determined with the information given

9. How does conducting multiple t-tests compare to conducting a single F-test?

(A) Multiple t-tests increase the chance of a Type I error.

- (B) Multiple t-tests decrease the chance of a Type I error.
- (C) Multiple t-tests do not affect the chance of a Type I error.
- (D) This comparison cannot be made without knowing the number of populations.

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10. If two random samples (x1, x2) of sizes 30 and 36 are selected independently from two populations with means 78 and 85, and standard deviations 12 and 15, respectively, then the mean of the difference x1 - x2 is equal to:
(A) -7 (B) 7 (C) 1.17 (D) 0.24

II. Short Answer (50%)

1. A marketing consultant was in the process of studying the perceptions of married couples concerning their weekly food expenditures. He believed that the husband's perception would be higher than the wife's. To judge his belief, he takes a random sample of ten married couples and asks each spouse to estimate the family food expenditure (in dollars) during the previous week. The data are shown below. Can the consultant conclude at the 5% significance level that the husband's estimate is higher than the wife's estimate? (10%)

Couple	Husband	Wife
1	380	270
2	280	300
3	215	185
4	350	320
5	210	180
6	410	390
7	250	250
8	360	320
9	180	170
10	400	330

- 2. Random samples from two normal populations produced the following statistics: $n_1=10$, $s_1^2=32$, $n_2=15$, and $s_2^2=22$. Is there enough evidence at the 5% significance level to infer that the variance of Population 1 is larger than the variance of Population 2? (10%)
- 3. A statistician estimated the multiple regression model

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \varepsilon$$

with 45 observations. The computer output is shown below. However, because of a printer malfunction, some of the results are not shown. These are indicated by the boldface letters a to j. Fill in the missing results (up to three decimal places). (20%)

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共4頁,第2頁

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共4頁,第3頁

Predictor	Coef	StDev	Т
Constant	а	3.51	2.03
<i>x</i> ₁	21.6	Ь	4.73
<i>x</i> ₂	-12.5	7.61	С

S = d R-Sq = e

ANALYSIS OF VARIANCE

Source of Variation	df	SS	MS
Regression	f	i	j
Error	g	388	9.238
Total	h	519	

4. The probability that a patient recovers from a rare blood disease is 0.4. (10%)

- (1) If 100 people are known to have contracted this disease, what is the probability that less than 30 survive?
- (2) If 100 people are known to have contracted this disease, what is the probability that exactly 35 survive?
 t-Distribution Table



The shaded area is equal to α for $t = t_{\alpha}$.

df	t.100	t.050	1.025	t.010	t.005
1	3.078	6.314	12.706	31.821	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947

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共4頁,第4頁

	F-Distribution Table										
d_2		1	2	3	4	d 1	5 1	6	7		8
-	1.61	4	100 5	915 7	224	2 000		094.0	0.96 0	000	0 94
2	18	4 . 51 :	199.5	215.7	10.25	5 250 5 10	0.2 :	234.0	230.8	200. 10.3	9 24) 7 10
3	10.	13	9.55	9.28	9.15	2 9	9.3 . .01	8.94	8.89	8.8	5 8
4	7.	71	6.94	6.59	6.39	6.	.26	6.16	6.09	6.0	4 6.
5	6.6	61	5.79	5.41	5.19) 5.	.05	4.95	4.88	4.8	2 4
6	5.9	99	5.14	4.76	4.53	3 4.	.39	4.28	4.21	4.1	5 4
7	5.	59	4.74	4.35	4.12	2 3.	.97	3.87	3.79	3.7	3 3
8	5.	32	4.46	4.07	3.84	4 3.	.69	3.58	3.50	3.4	4 3
10	- Э. 4 4	12 06	4.26	3.86	3.63	53. 59	.48	3.37	3.29	3.2	33. 79
11	4.4	90 84	3.98	3.59	3.30	5 3. 3 3.	.20	3.09	3.01	2.9	5 2
12	4.	75	3.89	3.49	3.26	3 3.	.11	3.00	2.91	2.8	5 2
13	4.6	67	3.81	3.41	3.18	3 3.	.03	2.92	2.83	2.7	7 2
14	4.6	60	3.74	3.34	3.11	1 2.	.96	2.85	2.76	2.7	0 - 2
15	4.	54	3.68	3.29	3.06	3 2.	.90	2.79	2.71	2.6	4 2
16	4.4	49	3.63	3.24	3.01	12.	.85	2.74	2.66	2.5	92. 592
18	4.4	40 41	3.59	3.20	2.90) 2. } 2	.01	2.70	2.01	2.5	52. 19
19	4.1	38	3.52	3.13	2.90	2	74	2.63	2.53 2.54	2.4	8 2
20	4.	35	3.49	3.10	2.87	7 2.	.71	2.60	2.51	2.4	5 2
21	4.	32	3.47	3.07	2.84	4 2.	.68	2.57	2.49	2.4	2 2
22	4.	30	3.44	3.05	2.82	2 2.	.66	2.55	2.46	2.4	0 2
23	4.	28	3.42	3.03	2.80) 2.	.64	2.53	2.44	2.3	7 2.
24	4.3	26 94	3.40	3.01	2.70	52. 39	.62 .60	2.51	2.42	2.3	62. 49
20	4.,	24	0.09	2.99	2.10	, 2.	.00	2.43	2.40	2.0	4 2
			Star	ndard	Norm	nal Di	istrib	ution	Table		
						0	-	_			
						-	-				
	Z	.00	.01	.02	03	04					
	0.0				.05	.04	.05	.06	.07	.08	.09
		.0000	.0040	.0080	.0120	.0160	.05	.06	.07	.08	.09
	0.1	.0000 .0398 .0793	.0040 .0438 .0832	.0080 .0478 .0871	.0120 .0517 .0910	.0160 .0557 .0948	.05 .0199 .0596 .0987	.06 .0239 .0636 1026	.07 .0279 .0675 1064	.08 .0319 .0714 1103	.09 .0359 .0753 1141
	0.1 0.2 0.3	.0000 .0398 .0793 .1179	.0040 .0438 .0832 .1217	.0080 .0478 .0871 .1255	.0120 .0517 .0910 .1293	.04 .0160 .0557 .0948 .1331	.05 .0199 .0596 .0987 .1368	.06 .0239 .0636 .1026 .1406	.07 .0279 .0675 .1064 .1443	.08 .0319 .0714 .1103 .1480	.09 .0359 .0753 .1141 .1517
	0.1 0.2 0.3 0.4	.0000 .0398 .0793 .1179 .1554	.0040 .0438 .0832 .1217 .1591	.0080 .0478 .0871 .1255 .1628	.0120 .0517 .0910 .1293 .1664	.04 .0160 .0557 .0948 .1331 .1700	.05 .0199 .0596 .0987 .1368 .1736	.06 .0239 .0636 .1026 .1406 .1772	.07 .0279 .0675 .1064 .1443 .1808	.08 .0319 .0714 .1103 .1480 .1844	.09 .0359 .0753 .1141 .1517 .1879
	0.1 0.2 0.3 0.4 0.5	.0000 .0398 .0793 .1179 .1554 .1915	.0040 .0438 .0832 .1217 .1591 .1950	.0080 .0478 .0871 .1255 .1628 .1985	.0120 .0517 .0910 .1293 .1664 .2019	.0160 .0557 .0948 .1331 .1700 .2054	.05 .0199 .0596 .0987 .1368 .1736 .2088	.06 .0239 .0636 .1026 .1406 .1772 .2123	.07 .0279 .0675 .1064 .1443 .1808 .2157	.08 .0319 .0714 .1103 .1480 .1844 .2190	.09 .0359 .0753 .1141 .1517 .1879 .2224
	0.1 0.2 0.3 0.4 0.5 0.6	.0000 .0398 .0793 .1179 .1554 .1915 .2257	.0040 .0438 .0832 .1217 .1591 .1950 .2291	.0080 .0478 .0871 .1255 .1628 .1985 .2324	.0120 .0517 .0910 .1293 .1664 .2019 .2357	.0160 .0557 .0948 .1331 .1700 .2054 .2389	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454	.07 .0279 .0675 .1064 .1443 .1808 .2157 .2486 .2486	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549
	0.1 0.2 0.3 0.4 0.5 0.6 0.7	.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580	.0040 .0438 .0832 .1217 .1591 .1950 .2291 .2611 .2010	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2020	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2673	.0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422 .2734 .2734	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764	.07 .0279 .0675 .1064 .1443 .1808 .2157 .2486 .2794 .2079	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .2106	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .2852
	0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9	.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159	.0040 .0438 .0832 .1217 .1591 .1950 .2291 .2611 .2910 .3186	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238	.0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422 .2734 .3023 .3289	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315	.07 .0279 .0675 .1064 .1443 .1808 .2157 .2486 .2794 .3078 .3340	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389
	0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0	.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413	.0040 .0438 .0832 .1217 .1591 .1950 .2291 .2611 .2910 .3186 .3438	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485	.0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3508	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422 .2734 .3023 .3289 .3531	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554	.07 .0279 .0675 .1064 .1443 .1808 .2157 .2486 .2794 .3078 .3340 .3577	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621
	0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1	.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643	.0040 .0438 .0832 .1217 .1591 .1950 .2291 .2611 .2910 .3186 .3438 .3665	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708	.0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3508 .3729	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422 .2734 .3023 .3289 .3531 .3749	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3770	.07 .0279 .0675 .1064 .1443 .1808 .2157 .2486 .2794 .3078 .3340 .3577 .3790	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830
	0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2	.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3849	.0040 .0438 .0832 .1217 .1591 .1950 .2291 .2611 .2910 .3186 .3438 .3665 .3869	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907	.0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3508 .3729 .3925	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422 .2734 .3023 .3289 .3531 .3749 .3944	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3770 .3962	.07 .0279 .0675 .1064 .1443 .1808 .2157 .2486 .2794 .3078 .3340 .3577 .3790 .3980	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015
	0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3	.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3849 .4032	.0040 .0438 .0832 .1217 .1591 .2291 .2611 .2910 .3186 .3438 .3665 .3869 .4049	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888 .4066	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907 .4082	.0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3508 .3729 .3925 .4099 .4059	05 0199 0596 0987 1368 1736 2088 .2422 .2734 .3023 .3289 .3531 .3749 .3944 .4115	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3770 .3962 .4131	07 0279 0675 1064 .1443 .1808 .2157 .2486 .2794 .3078 .3340 .3577 .3790 .3980 .4147	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4217
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ 1.1 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ \end{array}$.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3849 .4032 .4192	.0040 .0438 .0832 .1217 .1591 .2291 .2910 .2910 .3186 .3438 .3665 .3869 .4049 .4049 .4245	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888 .4066 .4222 .4257	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907 .4082 .4236	.04 .0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3729 .3925 .4099 .4251 .4382	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422 .2734 .3023 .3289 .3531 .3749 .3944 .4115 .4265 .4394	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3770 .3962 .4131 .4279 .4406	07 0279 0675 1064 .1443 .1808 .2157 .2486 .2794 .3078 .3340 .3577 .3790 .3980 .4147 .4292 .4147	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4411
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ 1.1 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ 1.6 \\ \end{array}$.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3849 .4032 .4192 .4332 .4452	.0040 .0438 .0832 .1217 .1591 .2291 .2291 .2910 .3186 .3438 .3665 .3869 .4049 .4207 .4345	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888 .4066 .4222 .4357 .4474	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907 .4082 .4236 .4370	.0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3508 .3729 .3925 .4099 .4251 .4382	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422 .2734 .3023 .3289 .3531 .3749 .3944 .4115 .4265 .4394 .4505	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3770 .3962 .4131 .4279 .4406 .4515	07 0279 0675 1064 1443 2157 2486 2794 3078 3340 3577 3790 3980 4147 4292 4414 455	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4441
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ \hline 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ \hline 1.1 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ \hline 1.6 \\ 1.7 \\ \end{array}$.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3849 .4032 .4192 .4332 .4452 .4554	.0040 .0438 .0832 .1217 .1591 .2291 .2291 .22910 .3186 .3438 .3665 .3869 .4049 .4207 .4345 .4463 .4564	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888 .4066 .4222 .4357 .4474 .4573	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907 .4082 .4236 .4370 .4484 .4582	.0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3508 .3729 .3925 .4099 .4251 .4382 .4495 .44951	.05 .0199 .0596 .0987 .1368 .1736 .2422 .2734 .3023 .3289 .3531 .3749 .3944 .4115 .4265 .4394 .4505	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3554 .3770 .3962 .4131 .4279 .4406 .4515 .4608	07 0279 0675 1064 1443 2157 2486 2794 3078 3340 3577 3790 3980 4147 4292 4418 4525 4616	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429 .4535 .4625	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4441 .4545 .4633
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ \hline 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ \hline 1.1 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ \hline 1.6 \\ 1.7 \\ 1.8 \\ \hline \end{array}$.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3849 .4032 .4192 .4332 .4452 .4554	.0040 .0438 .0832 .1217 .15910 .22911 .2611 .2910 .3186 .3438 .3665 .3869 .4049 .4207 .4345 .4454 .4564	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888 .4066 .4222 .4357 .4474 .4573 .4656	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907 .4082 .4236 .4370 .4484 .4582 .4664	.014 .0150 .0557 .0948 .1331 .1700 .2054 .2704 .2995 .3264 .3508 .3729 .3925 .4099 .4251 .4382 .4495 .4495 .44951 .4671	.05 .0199 .0596 .0987 .1368 .1736 .2422 .2734 .3023 .3289 .3531 .3749 .3944 .4115 .4265 .4394 .4505 .4599 .4678	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3554 .3770 .3962 .4131 .4279 .4405 .4508 .4608 .4686	07 0279 0675 1064 1443 2157 2486 2794 3078 3340 3577 3790 3980 4147 4292 4418 4525 4616 4693	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429 .4535 .4625 .4699	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4441 .4545 .4633 .4706
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ \hline 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ \hline 1.1 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ \hline 1.6 \\ 1.7 \\ 1.8 \\ 1.9 \\ 9 \\ 1.9 \\ 1.0 \\ \hline 0.9 \\ 1.0 \\ 1.1 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.7 \\ 1.8 \\ 1.9 \\ 1.9 \\ 1.0 \\$.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3849 .4032 .4332 .4452 .4554 .4641 .4713	.0040 .0438 .0832 .1217 .1591 .2291 .2611 .2910 .3186 .3438 .3665 .3869 .4049 .4207 .4345 .4454 .4564 .4649 .4719	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888 .4066 .4222 .4357 .4474 .4573 .4656 .4726	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907 .4082 .4236 .4370 .4484 .4582 .4664 .4732	.014 .0157 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3508 .3729 .3925 .4099 .4251 .4382 .4495 .4495 .4495 .4495	.05 .0199 .0596 .0987 .1368 .1736 .2088 .2422 .2734 .3023 .3289 .3531 .3749 .3944 .4115 .4265 .4394 .4505 .4599 .4678 .4744	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3554 .3770 .3962 .4131 .4279 .4406 .4515 .4608 .4686 .4750	07 0279 0675 1064 1443 2157 2486 2794 3078 3340 3577 3790 3980 4147 4292 4418 4525 4616 4693 4756	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429 .4535 .4625 .4699 .4761	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4441 .4545 .4633 .4706 .4767
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.7 \\ 1.8 \\ 1.9 \\ 2.0 \\ 2.1 \\ \end{array}$.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3643 .3643 .3643 .3643 .4032 .4452 .4554 .4554 .4641 .4713 .4772	.0040 .0438 .0832 .1217 .1591 .2291 .2611 .2910 .3186 .3438 .3665 .3869 .4049 .4207 .4345 .4564 .4564 .4649 .4719 .4719	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888 .4066 .4222 .4357 .4474 .4573 .4656 .4726 .4726 .4726	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3485 .3708 .4082 .4236 .4370 .4484 .4582 .4664 .4732 .4782	.014 .0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3508 .3729 .4251 .4392 .4499 .4251 .4392 .4495 .4591 .4591 .4738 .4738	05 0199 0596 0987 1368 2422 2734 3023 2288 2422 2734 3028 2422 2734 3028 3339 3344 4115 4265 4394 44505 4599 4678 4744 4798	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3554 .3770 .3962 .4131 .4279 .4406 .4515 .4608 .4686 .4750 .4886	07 0279 0675 1064 1443 2157 2486 2794 3078 3340 3577 3790 3980 4147 4292 4418 4525 4418 4616 4693 4756 4808	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429 .4535 .4625 .4699 .4761 .4812 .4954	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4441 .4545 .4633 .4706 .4767 .4817 .4857
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ 1.1 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.7 \\ 1.8 \\ 1.9 \\ 2.0 \\ 2.1 \\ 2.2 \\ 2.2 \\ 1.2 \\ 1.4 \\ 1.5 \\ 1.5 \\ 1.6 \\ 1.7 \\ 1.8 \\ 1.9 \\ 2.0 \\ 1.2 \\$.0000 .0398 .0793 .1179 .1554 .1915 .2257 .2580 .2881 .3159 .3413 .3643 .3643 .3643 .3643 .3643 .4032 .4452 .4554 .4554 .4554 .4772 .4821 .4772	.0040 .0438 .0832 .1217 .1591 .2291 .2611 .2910 .3186 .3458 .3665 .3869 .4049 .4207 .4345 .4564 .4564 .4564 .4649 .4719 .4778 .48264	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .4222 .4357 .4474 .4573 .4656 .4726 .4783 .4838	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907 .4082 .4236 .4370 .4484 .4582 .4664 .4732 .4788 .4834 .4831	.014 .0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3729 .3925 .4099 .4251 .4382 .4495 .4591 .4671 .4738 .4793 .4838 .4793	05 0199 0596 0987 1368 2422 2734 3023 2288 2422 2734 3028 2422 2734 3028 33289 3531 3749 3944 4115 4265 4394 44505 44599 4678 4744 4798	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3770 .3962 .4131 .4279 .4406 .4515 .4608 .4686 .4750 .4803 .4845	07 0279 0675 1064 1443 2157 2486 2794 3078 3340 3577 3790 3350 4147 4292 4418 4525 4418 4525 4418 4616 4693 4756 4808	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429 .4535 .4625 .4699 .4761 .4812 .4812 .4887	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4411 .4545 .4633 .4706 .4767 .4817 .4817 .4897
	0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3	.0000 .0398 .0793 .1179 .1554 .2257 .2580 .2881 .3159 .4032 .4192 .4332 .4492 .4454 .45544 .4554 .45544.4554 .45544.45544.45544.45544.45544.45544.45544.45544.45544.45544.4556	.0040 .0438 .0832 .1217 .1591 .2291 .2611 .2910 .3186 .3468 .3468 .3469 .4049 .4207 .4345 .4564 .4649 .4719 .4778 .4826 .4864 .4896	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .3888 .4066 .4222 .4357 .4474 .4573 .4656 .4726 .4783 .4830 .4868 .4898	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .3907 .4082 .4236 .4370 .4484 .4582 .4664 .4732 .4788 .4834 .4871	.014 .0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3729 .3925 .3925 .3925 .3925 .3925 .4099 .4251 .4382 .4495 .4591 .4671 .4738 .4793 .4838 .4838 .4838 .4838	.05 .0199 .0596 .0087 .1368 .1736 .2088 .2422 .2334 .3239 .3531 .3749 .4394 .4505 .4595 .4744 .4798 .4744 .4798 .4744 .4798 .4744 .4798 .4744 .4798 .4744 .4798 .4744 .4798 .4744 .4798 .4744 .4798 .4744 .4798 .4794 .4794 .4794 .4794 .4878 .4906	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3750 .3962 .4131 .4279 .4406 .4515 .4686 .4750 .4803 .4846 .4881 .4846	07 0279 0675 1064 1443 1808 2157 2486 2794 3078 3340 3577 3790 3980 4147 4292 4418 4525 4616 4693 4756 4808 4850 4884	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429 .4535 .4629 .44535 .4629 .4535 .4699 .4761 .4812 .4854 .4884 .4884 .4884	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4441 .4545 .4633 .4706 .4767 .4817 .4857 .4890 .4916
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ \hline 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ \hline 1.1 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ \hline 1.6 \\ 1.7 \\ 1.8 \\ 1.9 \\ 2.0 \\ 2.1 \\ 2.2 \\ 2.3 \\ 2.4 \\ \end{array}$.0000 .0398 .0793 .1179 .1554 .1554 .1515 .2257 .2880 .2881 .3159 .4192 .4332 .4452 .4332 .4452 .4454 .45544 .45544 .45544 .45544 .45544 .45544 .45544 .45544 .4554444444 .45544444444	.0040 .0438 .0832 .1217 .1591 .2291 .2611 .2910 .3186 .3485 .3669 .4049 .4207 .4345 .4564 .4649 .4719 .4778 .4826 .4826 .4826 .4826 .4826 .4826 .4826 .4826 .4826 .4826 .4826	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .4222 .4357 .4474 .4573 .4474 .4573 .4656 .4726 .4783 .4830 .4868 .4898 .4898 .4922	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .4082 .4236 .4370 .4484 .4582 .4664 .4732 .4684 .4732 .4834 .48901 .49025	.014 .0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3729 .3925 .3925 .3925 .3925 .4099 .4251 .4382 .4495 .4591 .4671 .4738 .4793 .4838 .4838 .4838 .4838 .4838 .4904 .4927	.05 .0199 .0566 .0877 .1368 .1736 .2088 .2422 .2734 .3023 .3289 .3531 .3749 .3544 .4115 .4394 .4505 .4599 .4678 .4744 .4798 .4744 .4798 .4744 .4798 .4744 .4906 .4929	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3770 .3962 .4131 .4279 .4406 .4515 .4608 .4686 .4750 .4803 .4846 .4846 .4846 .4849 .4809 .4931	07 0279 0675 1064 1443 2157 2486 2794 3078 3340 3577 3790 3980 4147 4292 4418 4525 4418 4525 4418 4525 4693 4756 4808 4850 4850 4850	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429 .4535 .4625 .4699 .4761 .4812 .4854 .4887 .4884 .4887 .4913 .4934	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4441 .4545 .4633 .4706 .4767 .4817 .4857 .4890 .48916 .4936
	$\begin{array}{c} 0.1 \\ 0.2 \\ 0.3 \\ 0.4 \\ 0.5 \\ 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ 1.2 \\ 1.3 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.7 \\ 1.8 \\ 1.9 \\ 2.0 \\ 2.1 \\ 2.2 \\ 2.3 \\ 2.4 \\ 2.5 \\ \end{array}$.0000 .0398 .0793 .1179 .1554 .1554 .1515 .2257 .2580 .2881 .3159 .4192 .4332 .4452 .4332 .4454 .45544 .45544 .45544 .45544 .45544 .45544 .45544 .45544 .4554444444 .45544444444	.0040 .0438 .0832 .1217 .1591 .2291 .2611 .2910 .3186 .3468 .3468 .3469 .4049 .4207 .4345 .4564 .4649 .4719 .4778 .4826 .4864 .4826 .4826 .4820 .4920 .4940	.0080 .0478 .0871 .1255 .1628 .1985 .2324 .2642 .2939 .3212 .3461 .3686 .4222 .4357 .4474 .4573 .4656 .4726 .4783 .4656 .4726 .4783 .4830 .4868 .4898 .4898 .4892 .4941	.0120 .0517 .0910 .1293 .1664 .2019 .2357 .2673 .2967 .3238 .3485 .3708 .4082 .4236 .4370 .4484 .4582 .4788 .4834 .4871 .4901 .4925 .4943	.014 .0160 .0557 .0948 .1331 .1700 .2054 .2389 .2704 .2995 .3264 .3729 .3925 .3925 .3925 .3925 .4099 .4251 .4382 .4495 .4591 .4671 .4738 .4793 .4838 .4838 .4838 .4838 .4838 .4904 .4927 .4945	.05 .0199 .0566 .0877 .1368 .1736 .2088 .2422 .2734 .3023 .3289 .3531 .3749 .3544 .4115 .4394 .4505 .4599 .4678 .4744 .4798 .4744 .4798 .4744 .4906 .4929 .4946	.06 .0239 .0636 .1026 .1406 .1772 .2123 .2454 .2764 .3051 .3315 .3554 .3770 .3962 .4131 .4279 .4406 .4515 .4608 .4686 .4750 .4803 .4846 .4881 .4846 .4881 .4909 .4931 .4948	07 0279 0675 1064 1443 1808 2157 2486 2794 3078 3340 3577 3790 3980 4147 4292 4418 4525 4616 4693 4756 4808 4850 4880 4850 4881 4931 4932 4949	.08 .0319 .0714 .1103 .1480 .1844 .2190 .2517 .2823 .3106 .3365 .3599 .3810 .3997 .4162 .4306 .4429 .4535 .4629 .4535 .4629 .4535 .4699 .4761 .4812 .4854 .4884 .4887 .4913 .4934 .4951	.09 .0359 .0753 .1141 .1517 .1879 .2224 .2549 .2852 .3133 .3389 .3621 .3830 .4015 .4177 .4319 .4441 .4545 .4633 .4706 .4767 .4817 .4857 .4890 .4916 .4936 .4952