KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA

STAT 211: BUSINESS STATISTICS I

Semester 112
Final Exam
Tuesday May 22, 2012
7:00 - 10:00 pm

Please **circle** your:

Instructor Name and Section (time)

Mohammad H. Omar	3 (10:00 – 10:50)		
Mohammad Saleh	1 (8:00 – 8:50)	2 (9:00 – 9:50)	6 (11:00 – 11:50)

Name: Student ID#: Serial #:

Directions:

1) Turn off your mobile phones, i-pads, etc. These communication devices are strictly prohibited by the university during exams. Those found with these devices switched on may be subjected to the university cheating policy.
2) You must also put your student ID visibly on your desk so that the proctors may verify your identity.
3) You must **show all work** to obtain full credit for problem solving questions on this exam.
4) **DO NOT round** your answers at each step. Round answers only if necessary at **your final step to 4 decimal places**.

Question No	Full Marks	Marks Obtained
Q1	15	
Q2	10	
Q3	5	
Q4	10	
Q5	18	
Q6	17	
Q7	15	
Total	90	

Question One: (*3+4+8=15 points*)

a. A new filter system for swimming pool is designed to filter out certain harmful particles that can get into the water. A study shows that the number of particles per gallon of water is normally distributed, with mean of 20 thousand and standard deviation of 3 thousand. The filter is designed to catch 25 thousand particular per gallon,

1. The manufacturer of the filter claims that the filter removes 90% of the particles from the water. Is this statement correct? Support your answer with reasons using probability.

2. If the filter fulfilled the claim made by the manufacturer, how many particles per gallon of water the filter remove?

b. TransUnion is a leading global provider of business intelligence services. TransUnion enables businesses to manage financial risk and capitalize on market opportunities using credit decisioning and fraud prevention tools, advanced target-marketing products, risk and profitability models, and portfolio management. TransUnion reported that 33% of the mortgages in 2005 were adjustable-rate mortgage (ARMS). In a sample of 90 mortgages, what would the probability be that the number of mortgages with ARMs would be more than 25 but less than 35?

<u>Question Two:</u> (<u>2+5+2=*10 points*</u>)

Suppose that 5,000 sales invoices at Panda are separated into four strata of sales categories. Stratum 1 contains 50 invoices, stratum 2 contains 500 invoices, stratum 3 contains 1,000 invoices, and stratum 4 contains 3,450 invoices. A sample of 500 sales invoices is needed.

1. What type of sampling should you do? Provide your rational why?

2. Explain how you would carry out the sampling according to the method stated in (a).

3. Why is the sampling in (a) not simple random sampling?

Question Three: (5 *points*)

The division manager for pipe and steel company has decided to implement a new incentive system for the managers of three plants. The plan calls for a bonus to be paid next month to the manager whose plant **has greatest relative improvement over the average** monthly production volume. The following data reflect the historical production volumes at the three plants:

Plant 1	Plant 2	Plant 3
Mean = 700	Mean = 2300	Mean = 1200
Standard deviation = 200	Standard deviation = 350	Standard deviation = 30

At the close of next month, the monthly output for the three plants was:

Plant 1 = 810, Plant 2 = 2600, Plant 3 = 1320

Suppose the division manager has awarded the bonus to the manager of plant 2 since her plant increased its production by 300 units over the mean. This was more than that for any of the other managers. Do you agree with the award of the bonus for this month? Explain.

Question Four: (3+7 =*10 points*)

A standard admissions test was given at three locations. One thousand students took the test at location A, 600 students at location B, and 400 students at location C. The percentages of students from locations A, B, and C, who passed the test, were 70%, 68%, and 77%, respectively. One student is selected at random from among those who took the test.

1. What is the probability that the selected student took the test at location C and failed?

2. If the selected student passed the test, what is the probability that the student took the test at location B?

Question Five: (8+10 =*18 points*)

Crawford & Associates was recently contracted to survey customers of one of the nation's largest food chains to estimate the difference in mean time spent in the store per visit between men and women shoppers.

The sample mean of 25 male shoppers is 34.5 minutes with a standard deviation of 11 minutes while the sample mean for 36 female shoppers is 42.4 minutes with a standard deviation of 16 minutes.

1. Develop a 95% confidence interval estimate for the mean time taken by male shoppers. Be sure to write your conclusion and the assumptions

2. Develop a 95% confidence interval estimate for the mean difference in time taken by male and female shoppers. Be sure to write your conclusion and the assumptions

Question Six: (*7+3+7 =17 points*)

A marketing firm is interested in determining whether there is a difference between the proportion of households in Chicago and the proportion of households in Milwaukee who purchase groceries online. The research firm decided to randomly sample households earning over $50,000 a year in the two cities and ask them if they purchased any groceries online last year. The random sample involved 150 Chicago households and 140 Milwaukee households. The results show that 60 households in Chicago do online groceries while 63 in Milwaukee do online groceries.

1. Construct a 90% confidence interval estimate for the population proportion of Chicago households who purchase groceries online. Be sure to write your conclusion and the assumptions

2. You want to estimate the proportion of Chicago households who purchase groceries online with 99% confidence with error margin at most 0.05. Find the minimum sample size necessary for this estimation.

3. Construct a 90% confidence interval estimate for the difference between the two population proportions of households who purchase groceries online. Be sure to write your conclusion and the assumptions

Question Seven: (*1 point each*)

Answer the following questions by choosing the correct answer. Also, record all your choices in this table

Q1	a	b	c	d
Q2	a	b	c	d
Q3	a	b	c	d
Q4	a	b	c	d
Q5	a	b	c	d
Q6	a	b	c	d
Q7	a	b	c	d
Q8	a	b	c	d
Q9	a	b	c	d
Q10	a	b	c	d
Q11	a	b	c	d
Q12	a	b	c	d
Q13	a	b	c	d
Q14	a	b	c	d
Q15	a	b	c	d

For the ***first three*** questions below, choose the *best answer* that correctly fills in the blank space.

1. A large normally distributed population has mean 25. Consider all samples of size 25. The number $\frac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}}$ is ____________

   a. t distributed with 24 degrees of freedom
   b. normally distributed
   c. t distributed with 26 degrees of freedom
   d. neither t nor normal

2. The level of satisfaction ("Very unsatisfied", "Fairly unsatisfied", "Fairly satisfied", and "Very satisfied") in a class is an example of ______________.

   a. an ordinal scaled variable
   b. a nominal scaled variable
   c. an interval scaled variable
   d. a ratio scaled variable

3. The classification of student major (accounting, economics, management, marketing, other) is an example of ____________

   a. a categorical random variable.
   b. a discrete random variable.
   c. a continuous random variable.
   d. a mixed random variable.

4. The standard error of the mean for a sample of 100 is 30. If the population standard deviation is known, in order to cut the standard error of the mean to 15, we would

   a. increase the sample size to 200.
   b. increase the sample size to 400.
   c. decrease the sample size to 50.
   d. decrease the sample to 25.

Consider the data below for the next ***four*** questions.

The ordered array below resulted from taking a sample of 25 batches of 500 computer chips and determining how many in each batch were defective.

1	2	4	4	5	5	6	7	9	9	12	12	15
17	20	21	23	23	25	26	27	27	28	29	29	

5. What is the **median** for this data?

   a. 15
   b. 13
   c. 14
   d. 16

6. Which below describes the **shape** of the distribution for this data?

   a. positively skewed
   b. negatively skewed
   c. symmetrical
   d. bimodal skewed right.

7. What approximately is the **standard deviation** for this data?
   a. 95.84
   b. 15.44
   c. 9.7897
   d. 120

8. If a frequency distribution for the defects data is constructed, using "0 but less than 5" as the first class, the frequency of the “20 but less than 25” class would be.
   a. 3
   b. 4
   c. 5
   d. 20

9. Suppose A and B are independent events where $P(A) = 0.4$ and $P(B) = 0.5$. Then $P(A \text{ and } B) =$
   a. 0.2
   b. 0
   c. 0.9
   d. 0.7

10. Suppose A and B are mutually exclusive events where $P(A) = 0.4$ and $P(B) = 0.5$. Then $P(A \text{ and } B) =$
    a. 0.2
    b. 0
    c. 0.9
    d. 0.7

11. Suppose A and B are events where $P(A) = 0.4$, $P(B) = 0.5$, and $P(A \text{ and } B) = 0.1$. Then $P(A|B) =$
    a. 0.2
    b. 0.25
    c. 0.5
    d. 0.4

12. Suppose $\mu = 50$ and $\sigma^2 = 100$ for a population. In a sample of size 100 is randomly taken, 95% of all possible sample means will fall between____
    a. 48.04 and 51.96
    b. 46.96 and 53.92
    c. 30.40 and 69.60
    d. 49.804 and 50.196

13. Suppose the marketing manager who was earning $129,420 got a raise and is now earning $140,000. Indicate how this change would affect the mean and the standard deviation
    a. The mean will increase and the standard deviation will decrease
    b. The mean will decrease and the standard deviation will increase
    c. The mean will decrease and the standard deviation will decrease
    d. The mean will increase and the standard deviation will increase

14. During the busiest time of the day, customers arrive at the Le Café coffee shop on the average of 1.5 per 20-minute period. What is the probability that the time to a customer arrival is less than 3 minutes?
    a. 0.2015
    b. 0.7985
    c. 0.9889
    d. 0.1797

15. Enjaz bank processes an average of 3 electronic transfers per minute. For the next 2 minutes, what is the probability that there will be 1 or fewer electronic transfers processed?
    a. 0.01735
    b. 0.01487
    c. 0.00248
    d. 0.19915

Some Useful Formulas

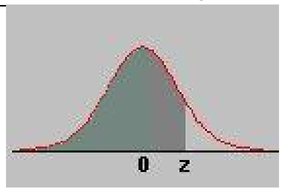
- W =(max-min)/(# classes)
- $\bar{x} = \frac{1}{n}\sum x$
- $R_\alpha = \frac{\alpha}{100}(n+1) = i + d, \quad \alpha = 1,....,99; \quad P_\alpha = (1-d)x_{(i)} + dx_{(i+1)}$
- $S = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}} = \sqrt{\frac{\sum x^2 - \left(\sum x\right)^2 / n}{n-1}}$
- $Z = \frac{X - \mu_x}{\sigma_x} \qquad CV = \frac{s}{\bar{x}} * 100\%$
- **P(A or B) = P(A ∪ B) = P(A) + P(B) – P(A∩B)**
- **P(A ∩ B') = P(A) – P(A ∩ B)**
- $P(A|B) = \frac{P(A \cap B)}{P(B)}, P(B) > 0$
- **P(A ∩ B) = P(A) × P(B | A) = P(B) × P(A|B)**
- $P(B_j | A) = \frac{P(B_j \cap A)}{P(A)} = \frac{P(A|B_j)P(B_j)}{\sum_{i=1}^{k} P(A|B_i)P(B_i)}$ for $j = 1,2,...,k$
- $P(x) = \frac{n!}{x!(n-x)!}\pi^x (1-\pi)^{n-x}$
- $\mu_x = E(X) = n\pi, \quad \sigma_x = \sqrt{n\pi(1-\pi)}$
- $P(x) = \frac{(\lambda t)^x e^{-\lambda t}}{x!}, \quad \mu_x = \lambda t, \sigma_x = \sqrt{\lambda t}$
- $P(x) = \frac{C_{n-x}^{N-A} C_x^A}{C_n^N} = \frac{\binom{N-A}{n-x}\binom{A}{x}}{\binom{N}{n}}$
- $\mu_x = E[X] = \sum_{all\ x} x_i P(x_i)$ or $\mu_x = E[X] = \int_{-\infty}^{\infty} xf(x)dx$
- $E[X^2] = \sum_{all\ x} x^2 P(x)$ or $\mu_x = E[X^2] = \int_{-\infty}^{\infty} x^2 f(x)dx$
- $\sigma_x^2 = E[X^2] - \mu_x^2$
- $\sigma_{xy} = \sum_{i=1}^{n} (x_i - E[X])(y_i - E[Y])P(x_i \text{ and } y_j)$

- $f(x) = \begin{cases} \frac{1}{b-a} & if\ a \le x \le b \\ 0 & otherwise \end{cases},$

  $a \le c < d \le b \rightarrow P(c \le X \le d) = (d-c)f(x)$
- $P(0 \le x \le a) = \int_0^a \lambda e^{-\lambda x} dx = 1 - e^{-\lambda a}$
- $\mu_{\bar{x}} = \mu_x, \quad \sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{n}}, \quad Z = \frac{\bar{X} - \mu_x}{\sigma_x / \sqrt{n}}$
- $\mu_p = \pi, \sigma_p = \sqrt{\frac{\pi(1-\pi)}{n}},$
- $\bar{x} \pm z_{\alpha/2}\frac{\sigma_x}{\sqrt{n}}$
- $\bar{x} \pm t_{\alpha/2,n-1}\frac{s}{\sqrt{n}}$
- $n \ge \frac{z_{\alpha/2}^2 \sigma^2}{e^2} = \left(\frac{z_{\alpha/2}\sigma}{e}\right)^2$
- $p \pm z_{\alpha/2}\sqrt{\frac{p(1-p)}{n}}$
- $n \ge \frac{z_{\alpha/2}^2 p(1-p)}{e^2}$
- $(\bar{x}_1 - \bar{x}_2) \pm z_{\alpha/2}\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$
- $(\bar{x}_1 - \bar{x}_2) \pm z_{\alpha/2}\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$
- $(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2, n_1+n_2-2}\ s_p\sqrt{\frac{1}{n_1} + \frac{1}{n_2}},$

  where $s_p = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}}$
- $\bar{d} \pm t_{\alpha/2,n-1}\frac{s_d}{\sqrt{n}}$
- $(p_1 - p_2) \pm z_{\alpha/2}\sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}$

The cumulative Standard Normal distribution

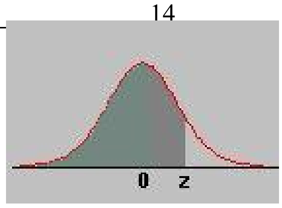


Entry represented area under the cumulative standardized normal distribution from - ∞ to Z

Cumulative Probabilities

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.0	**0.0013**	**0.0013**	**0.0013**	**0.0012**	**0.0012**	**0.0011**	**0.0011**	**0.0011**	**0.0010**	**0.0010**
-2.9	**0.0019**	**0.0018**	**0.0018**	**0.0017**	**0.0016**	**0.0016**	**0.0015**	**0.0015**	**0.0014**	**0.0014**
-2.8	**0.0026**	**0.0025**	**0.0024**	**0.0023**	**0.0023**	**0.0022**	**0.0021**	**0.0021**	**0.0020**	**0.0019**
-2.7	**0.0035**	**0.0034**	**0.0033**	**0.0032**	**0.0031**	**0.0030**	**0.0029**	**0.0028**	**0.0027**	**0.0026**
-2.6	**0.0047**	**0.0045**	**0.0044**	**0.0043**	**0.0041**	**0.0040**	**0.0039**	**0.0038**	**0.0037**	**0.0036**
-2.5	**0.0062**	**0.0060**	**0.0059**	**0.0057**	**0.0055**	**0.0054**	**0.0052**	**0.0051**	**0.0049**	**0.0048**
-2.4	**0.0082**	**0.0080**	**0.0078**	**0.0075**	**0.0073**	**0.0071**	**0.0069**	**0.0068**	**0.0066**	**0.0064**
-2.3	**0.0107**	**0.0104**	**0.0102**	**0.0099**	**0.0096**	**0.0094**	**0.0091**	**0.0089**	**0.0087**	**0.0084**
-2.2	**0.0139**	**0.0136**	**0.0132**	**0.0129**	**0.0125**	**0.0122**	**0.0119**	**0.0116**	**0.0113**	**0.0110**
-2.1	**0.0179**	**0.0174**	**0.0170**	**0.0166**	**0.0162**	**0.0158**	**0.0154**	**0.0150**	**0.0146**	**0.0143**
-2.0	**0.0228**	**0.0222**	**0.0217**	**0.0212**	**0.0207**	**0.0202**	**0.0197**	**0.0192**	**0.0188**	**0.0183**
-1.9	**0.0287**	**0.0281**	**0.0274**	**0.0268**	**0.0262**	**0.0256**	**0.0250**	**0.0244**	**0.0239**	**0.0233**
-1.8	**0.0359**	**0.0351**	**0.0344**	**0.0336**	**0.0329**	**0.0322**	**0.0314**	**0.0307**	**0.0301**	**0.0294**
-1.7	**0.0446**	**0.0436**	**0.0427**	**0.0418**	**0.0409**	**0.0401**	**0.0392**	**0.0384**	**0.0375**	**0.0367**
-1.6	**0.0548**	**0.0537**	**0.0526**	**0.0516**	**0.0505**	**0.0495**	**0.0485**	**0.0475**	**0.0465**	**0.0455**
-1.5	**0.0668**	**0.0655**	**0.0643**	**0.0630**	**0.0618**	**0.0606**	**0.0594**	**0.0582**	**0.0571**	**0.0559**
-1.4	**0.0808**	**0.0793**	**0.0778**	**0.0764**	**0.0749**	**0.0735**	**0.0721**	**0.0708**	**0.0694**	**0.0681**
-1.3	**0.0968**	**0.0951**	**0.0934**	**0.0918**	**0.0901**	**0.0885**	**0.0869**	**0.0853**	**0.0838**	**0.0823**
-1.2	**0.1151**	**0.1131**	**0.1112**	**0.1093**	**0.1075**	**0.1056**	**0.1038**	**0.1020**	**0.1003**	**0.0985**
-1.1	**0.1357**	**0.1335**	**0.1314**	**0.1292**	**0.1271**	**0.1251**	**0.1230**	**0.1210**	**0.1190**	**0.1170**
-1.0	**0.1587**	**0.1562**	**0.1539**	**0.1515**	**0.1492**	**0.1469**	**0.1446**	**0.1423**	**0.1401**	**0.1379**
-0.9	**0.1841**	**0.1814**	**0.1788**	**0.1762**	**0.1736**	**0.1711**	**0.1685**	**0.1660**	**0.1635**	**0.1611**
-0.8	**0.2119**	**0.2090**	**0.2061**	**0.2033**	**0.2005**	**0.1977**	**0.1949**	**0.1922**	**0.1894**	**0.1867**
-0.7	**0.2420**	**0.2389**	**0.2358**	**0.2327**	**0.2296**	**0.2266**	**0.2236**	**0.2206**	**0.2177**	**0.2148**
-0.6	**0.2743**	**0.2709**	**0.2676**	**0.2643**	**0.2611**	**0.2578**	**0.2546**	**0.2514**	**0.2483**	**0.2451**
-0.5	**0.3085**	**0.3050**	**0.3015**	**0.2981**	**0.2946**	**0.2912**	**0.2877**	**0.2843**	**0.2810**	**0.2776**
-0.4	**0.3446**	**0.3409**	**0.3372**	**0.3336**	**0.3300**	**0.3264**	**0.3228**	**0.3192**	**0.3156**	**0.3121**
-0.3	**0.3821**	**0.3783**	**0.3745**	**0.3707**	**0.3669**	**0.3632**	**0.3594**	**0.3557**	**0.3520**	**0.3483**
-0.2	**0.4207**	**0.4168**	**0.4129**	**0.4090**	**0.4052**	**0.4013**	**0.3974**	**0.3936**	**0.3897**	**0.3859**
-0.1	**0.4602**	**0.4562**	**0.4522**	**0.4483**	**0.4443**	**0.4404**	**0.4364**	**0.4325**	**0.4286**	**0.4247**
0.0	**0.5000**	**0.4960**	**0.4920**	**0.4880**	**0.4840**	**0.4801**	**0.4761**	**0.4721**	**0.4681**	**0.4641**

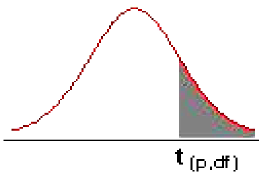
The cumulative Standard Normal distribution



Entry represented area under the cumulative standardized normal distribution from - ∞ to Z

Cumulative Probabilities

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	**0.5000**	**0.5040**	**0.5080**	**0.5120**	**0.5160**	**0.5199**	**0.5239**	**0.5279**	**0.5319**	**0.5359**
0.1	**0.5398**	**0.5438**	**0.5478**	**0.5517**	**0.5557**	**0.5596**	**0.5636**	**0.5675**	**0.5714**	**0.5753**
0.2	**0.5793**	**0.5832**	**0.5871**	**0.5910**	**0.5948**	**0.5987**	**0.6026**	**0.6064**	**0.6103**	**0.6141**
0.3	**0.6179**	**0.6217**	**0.6255**	**0.6293**	**0.6331**	**0.6368**	**0.6406**	**0.6443**	**0.6480**	**0.6517**
0.4	**0.6554**	**0.6591**	**0.6628**	**0.6664**	**0.6700**	**0.6736**	**0.6772**	**0.6808**	**0.6844**	**0.6879**
0.5	**0.6915**	**0.6950**	**0.6985**	**0.7019**	**0.7054**	**0.7088**	**0.7123**	**0.7157**	**0.7190**	**0.7224**
0.6	**0.7257**	**0.7291**	**0.7324**	**0.7357**	**0.7389**	**0.7422**	**0.7454**	**0.7486**	**0.7517**	**0.7549**
0.7	**0.7580**	**0.7611**	**0.7642**	**0.7673**	**0.7704**	**0.7734**	**0.7764**	**0.7794**	**0.7823**	**0.7852**
0.8	**0.7881**	**0.7910**	**0.7939**	**0.7967**	**0.7995**	**0.8023**	**0.8051**	**0.8078**	**0.8106**	**0.8133**
0.9	**0.8159**	**0.8186**	**0.8212**	**0.8238**	**0.8264**	**0.8289**	**0.8315**	**0.8340**	**0.8365**	**0.8389**
1.0	**0.8413**	**0.8438**	**0.8461**	**0.8485**	**0.8508**	**0.8531**	**0.8554**	**0.8577**	**0.8599**	**0.8621**
1.1	**0.8643**	**0.8665**	**0.8686**	**0.8708**	**0.8729**	**0.8749**	**0.8770**	**0.8790**	**0.8810**	**0.8830**
1.2	**0.8849**	**0.8869**	**0.8888**	**0.8907**	**0.8925**	**0.8944**	**0.8962**	**0.8980**	**0.8997**	**0.9015**
1.3	**0.9032**	**0.9049**	**0.9066**	**0.9082**	**0.9099**	**0.9115**	**0.9131**	**0.9147**	**0.9162**	**0.9177**
1.4	**0.9192**	**0.9207**	**0.9222**	**0.9236**	**0.9251**	**0.9265**	**0.9279**	**0.9292**	**0.9306**	**0.9319**
1.5	**0.9332**	**0.9345**	**0.9357**	**0.9370**	**0.9382**	**0.9394**	**0.9406**	**0.9418**	**0.9429**	**0.9441**
1.6	**0.9452**	**0.9463**	**0.9474**	**0.9484**	**0.9495**	**0.9505**	**0.9515**	**0.9525**	**0.9535**	**0.9545**
1.7	**0.9554**	**0.9564**	**0.9573**	**0.9582**	**0.9591**	**0.9599**	**0.9608**	**0.9616**	**0.9625**	**0.9633**
1.8	**0.9641**	**0.9649**	**0.9656**	**0.9664**	**0.9671**	**0.9678**	**0.9686**	**0.9693**	**0.9699**	**0.9706**
1.9	**0.9713**	**0.9719**	**0.9726**	**0.9732**	**0.9738**	**0.9744**	**0.9750**	**0.9756**	**0.9761**	**0.9767**
2.0	**0.9772**	**0.9778**	**0.9783**	**0.9788**	**0.9793**	**0.9798**	**0.9803**	**0.9808**	**0.9812**	**0.9817**
2.1	**0.9821**	**0.9826**	**0.9830**	**0.9834**	**0.9838**	**0.9842**	**0.9846**	**0.9850**	**0.9854**	**0.9857**
2.2	**0.9861**	**0.9864**	**0.9868**	**0.9871**	**0.9875**	**0.9878**	**0.9881**	**0.9884**	**0.9887**	**0.9890**
2.3	**0.9893**	**0.9896**	**0.9898**	**0.9901**	**0.9904**	**0.9906**	**0.9909**	**0.9911**	**0.9913**	**0.9916**
2.4	**0.9918**	**0.9920**	**0.9922**	**0.9925**	**0.9927**	**0.9929**	**0.9931**	**0.9932**	**0.9934**	**0.9936**
2.5	**0.9938**	**0.9940**	**0.9941**	**0.9943**	**0.9945**	**0.9946**	**0.9948**	**0.9949**	**0.9951**	**0.9952**
2.6	**0.9953**	**0.9955**	**0.9956**	**0.9957**	**0.9959**	**0.9960**	**0.9961**	**0.9962**	**0.9963**	**0.9964**
2.7	**0.9965**	**0.9966**	**0.9967**	**0.9968**	**0.9969**	**0.9970**	**0.9971**	**0.9972**	**0.9973**	**0.9974**
2.8	**0.9974**	**0.9975**	**0.9976**	**0.9977**	**0.9977**	**0.9978**	**0.9979**	**0.9979**	**0.9980**	**0.9981**
2.9	**0.9981**	**0.9982**	**0.9982**	**0.9983**	**0.9984**	**0.9984**	**0.9985**	**0.9985**	**0.9986**	**0.9986**
3.0	**0.9987**	**0.9987**	**0.9987**	**0.9988**	**0.9988**	**0.9989**	**0.9989**	**0.9989**	**0.9990**	**0.9990**



t Table with Right Tail Probabilities

ν \ α	**0.4**	**0.25**	**0.1**	**0.05**	**0.025**	**0.01**	**0.005**	**0.0005**
1	0.325	1.000	3.078	6.314	12.706	31.821	63.657	636.62
2	0.289	0.816	1.886	2.920	4.303	6.965	9.925	31.599
3	0.277	0.765	1.638	2.353	3.182	4.541	5.841	12.924
4	0.271	0.741	1.533	2.132	2.776	3.747	4.604	8.610
5	0.267	0.727	1.476	2.015	2.571	3.365	4.032	6.869
6	0.265	0.718	1.440	1.943	2.447	3.143	3.707	5.959
7	0.263	0.711	1.415	1.895	2.365	2.998	3.499	5.408
8	0.262	0.706	1.397	1.860	2.306	2.896	3.355	5.041
9	0.261	0.703	1.383	1.833	2.262	2.821	3.250	4.781
10	0.260	0.700	1.372	1.812	2.228	2.764	3.169	4.587
11	0.260	0.697	1.363	1.796	2.201	2.718	3.106	4.437
12	0.259	0.695	1.356	1.782	2.179	2.681	3.055	4.318
13	0.259	0.694	1.350	1.771	2.160	2.650	3.012	4.221
14	0.258	0.692	1.345	1.761	2.145	2.624	2.977	4.141
15	0.258	0.691	1.341	1.753	2.131	2.602	2.947	4.073
16	0.258	0.690	1.337	1.746	2.120	2.583	2.921	4.015
17	0.257	0.689	1.333	1.740	2.110	2.567	2.898	3.965
18	0.257	0.688	1.330	1.734	2.101	2.552	2.878	3.922
19	0.257	0.688	1.328	1.729	2.093	2.539	2.861	3.883
20	0.257	0.687	1.325	1.725	2.086	2.528	2.845	3.850
21	0.257	0.686	1.323	1.721	2.080	2.518	2.831	3.819
22	0.256	0.686	1.321	1.717	2.074	2.508	2.819	3.792
23	0.256	0.685	1.319	1.714	2.069	2.500	2.807	3.768
24	0.256	0.685	1.318	1.711	2.064	2.492	2.797	3.745
25	0.256	0.684	1.316	1.708	2.060	2.485	2.787	3.725
26	0.256	0.684	1.315	1.706	2.056	2.479	2.779	3.707
27	0.256	0.684	1.314	1.703	2.052	2.473	2.771	3.690
28	0.256	0.683	1.313	1.701	2.048	2.467	2.763	3.674
29	0.256	0.683	1.311	1.699	2.045	2.462	2.756	3.659
30	0.256	0.683	1.310	1.697	2.042	2.457	2.750	3.646
40	0.255	0.681	1.303	1.684	2.021	2.423	2.705	3.551
50	0.255	0.679	1.299	1.676	2.009	2.403	2.678	3.496
60	0.254	0.679	1.296	1.671	2.000	2.390	2.648	3.460
∞	0.253	0.674	1.282	1.645	1.960	2.326	2.576	3.291