Time Remaining: 00:14:58 Save Last saved on: July 3, 2015 3:54 PM Submit

Quiz 4

PART 1:

MULTIPLE CHOICE QUESTIONS: Two marks for each question 1 to 16. Some of the numbers in the provided choices have been rounded.

Question 1: (2 Points)

Bolts that are used in the construction of an electric transformer are supposed to be 0.060 inches in diameter, and any bolt with diameter less than 0.058 inches or greater than 0.062 inches must be scrapped. The machine that makes these bolts is set to produce bolts of 0.060 inches in diameter, but it actually produces bolts with diameters following a normal distribution with μ = 0.060 inches and σ= 0.001 inches. The proportion of bolts that must be scrapped is equal to:

- (●) 0.0456
- ( ) 0.0228
- ( ) 0.9772
- ( ) 0.3333
- ( ) 0.1667

Question 2: (2 Points)

It is known that the resistance of carbon resistors is normally distributed with μ = 1200 ohms and σ = 120 ohms. What proportion of the resistors has resistances that differ from the mean resistance by more than 120 ohms?

- ( ) 0.9544
- ( ) 0.3413
- ( ) 0.1587
- ( ) 0.6826
- (●) 0.3174

Question 3: (2 Points)

The time required to assemble an electronic component is normally distributed with a mean of 12 minutes and a standard deviation of 1.5 min. Find the probability that a particular assembly takes more than 14.25 minutes.

- ( ) .9332
- (●) .0668
- ( ) .3413
- ( ) .4332
- ( ) .1587

Question 4: (2 Points)

The cost of treatment per patient for a certain medical problem was modeled by one insurance company as a normal random variable with mean of $775 and standard deviation $150.

What is the probability that the treatment cost of a patient is less than $1,000, based on this model?

- .5000
- .6826
- .8531
- .9332
- Cannot be computed without knowledge of additional parameters

Question 5: (2 Points)

The time that a skier takes on a downhill course has a normal distribution with a mean of 12.3 minutes and standard deviation of 0.4 minutes. The probability that on a random run the skier takes between 12.1 and 12.5 minutes is:

- 0.1915
- 0.3830
- 0.3085
- 0.6170
- 0.6826

Questions 6 to 8 are based on the following:

The time taken by students to complete a COMM215 test has a normal distribution with mean 90 minutes and standard deviation 12 minutes. Use the normal distribution tables to answer the following 3 questions.

Question 6: (2 Points)

Using the information given above, we want to determine the length of time we should allow for the test so that 95% of the students are able to complete the exam in the time allowed. Which of the following is the closest to this time?

- 80 minutes
- 90 minutes
- 95 minutes
- 100 minutes
- 110 minutes

Question 7: (2 Points)

Using the information given above, what proportion of students will take longer than 95 minutes to complete the test? Mark the closest answer among the alternatives given.

- 0.05
- 0.25
- 0.34
- 0.50
- 0.68

Question 8: (2 Points)

If the students are given 1 hour and 45 minutes to complete the exam, what proportion of students will complete the exam within this given time? Mark the closest answer among the alternatives given.

- 0.70
- 0.75
- 0.80
- 0.85
- 0.90

Question 9:

(2 Points)

Scores on a test have a normal distribution with mean 20. 95% of the test scores are between 13 and 27.

What is the standard deviation of test scores?

- 5.525
- 7.000
- 3.571
- 1.000
- 6.250

Question 10:

(2 Points)

The Graduate Management Admission Test (GMAT) are used to help predict the performance of applicants to graduate business schools. The examinations are designed so that the mean score is 550 and the standard deviation of scores is 100. A certain graduate school will only accept applicants whose score on the GMAT is in the top 3%.

What score does an applicant need to achieve to be in the top 3%?

- 550 or above
- 900 or above
- 600 or above
- 360 or above
- 740 or above

Question 11:

(2 Points)

The number of times an adult human breathes per minute while at rest varies considerably from one person to another. Suppose the number of breaths has approximately a normal distribution with mean16 and standard deviation 4.

Approximately what percentage of adults take between 4 and 28 breaths per minute while at rest?

- 2.5%
- 99.7%
- 68%
- 16%
- 95%

Questions 12 to 13 are based on the following:

The daily milk production of Guernsey cows is approximately normally distributed with a mean of 35 kg/day and a standard deviation of 6 kg/day.

Question 12:

(2 Points)

The probability that a day's production for a single animal will be less than 28 kg is approximately:

- .41
- .09

- .38
- .12
- .62

Question 13:

(2 Points)

The producer is concerned when the milk production of a cow falls below the 5th percentile because the animal may be ill. The 5th percentile (in kg) of the daily milk production is approximately:

- 1.645
- -1.645
- 33.36
- 25.13
- 44.87

Question 14:

(2 Points)

Which of the following is NOT CORRECT about a standard normal distribution?

- $P(0 \leq Z \leq 1.50) = .4332$
- $P(Z \leq -1.0) = .1587$
- $P(Z \geq 2.0) = .0228$
- $P(Z \leq 1.5) = .9332$
- $P(Z \geq -2.5) = .4938$

Question 15:

(2 Points)

The time it takes (for any student) to complete a COMM 215 final exam is a random variable having a normal distribution with mean 160 minutes and standard deviation of 15 minutes. Anne, Amir, Claire and Sarah are four friends writing the exam.

What is the probability that at least one of them will complete the exam in less than 145 minutes? (Assume that their completion times are independent.)

- Less than 0.01
- Between 0.01 and 0.35
- Between 0.35 and 0.45
- Between 0.45 and 0.55
- Greater than 0.55

Question 16:

(2 Points)

The measurement of the width of the index finger of a human right hand is a normally distributed variable with a mean of 6 cm. and a standard deviation of 0.5 cm.

What is the probability that the finger width of a randomly selected person will be between 5 cm. and 7.5 cm?

- .9759
- .0241
- .9500
- 1.000

not within s 0.001 of these

PART 2

FILL IN THE BLANKS QUESTIONS. Three marks for each question 17 to 23.

NUMERICAL answers only

Solve a given problem and in the blank space provided, enter the NUMERICAL ANSWER ONLY. You MUST round your Final answers to 2 decimal places to avoid marking errors by the system.

Question 17:

(3 Points)

One of the side effects of flooding a lake in northern boreal forest areas (e.g. for a hydro-electric project) is that mercury is leached (leaked) from the soil, enters the food chain, and eventually contaminates the fish. The concentration in fish will vary among individual fish because of differences in eating patterns, movements around the lake, etc. Suppose that the concentration of mercury in individual fish follows an approximate normal distribution with a mean of 0.25 ppm and a standard deviation of 0.08 ppm. Fish are safe to eat if the mercury level is below 0.30 ppm.

What proportion of fish is safe to eat?

0.74

Question 18:

(3 Points)

The marks on a COMM 225 test are normally distributed with a mean of 62 and a variance of 225. If the instructor wishes to assign B's or higher to the top 30% of the students in the class, what mark is required to get a B or higher?

69.8

Question 19:

(3 Points)

In some courses (but certainly not in an intro stats course!), students are graded on a "normal curve". For example, students within s 0.5 standard deviations of the mean receive a C; between 0.5 and 1.0 standard deviations above the mean receive a C+; between 1.0 and 1.5 standard deviations above the mean receive a B; between 1.5 and 2.0 standard deviations above the mean receive a B+, etc. The class average in an exam was 60 with a standard deviation of 10. The proportion of students who will receive a B grade if the marks are actually normally distributed is:

0.09

Question 20:

(3 Points)

The diameters of steel disks produced in a plant are normally distributed with a mean of 2.5 cm and standard deviation of .02 cm. The probability that a disk picked at random has a diameter greater than 2.54 cm is about:

0.02

Question 21:

(3 Points)

The measurement of the width of the index finger of a human right hand is a normally distributed variable with a mean of 6 cm. and a standard deviation of 0.5 cm.

What is the probability that the finger width of a randomly selected person will be between 5 cm. and 7.5 cm.?

0.98

Question 22:

(3 Points)

The grade point averages of students at the Concordia University are approximately normally distributed with mean equal to 2.4 and standard deviation equal to 0.8.

What fraction of the students will possess a grade point average in excess of 3.0?

0.23

Question 23:

(3 Points) **The marks on a statistics test are normally distributed with a mean of 62 and a variance of 225. If the instructor wishes to assign B's or higher to the top 30% of the students in the class, what mark is required to get a B or higher?**

69.8

- END OF QUIZ -

Submit