Unless specified in the directions of the question, all answers are exact.  Choice E is always NOTA, which is "None of the Above".

1. If $P(A) = \dfrac{51}{100}$,   $P(B) = \dfrac{57}{100}$,   and   $P(A \,|\, B') = \dfrac{21}{43}$,   find   $P(B \,|\, A)$.

    a) $\dfrac{43}{78}$   b) $\dfrac{17}{26}$   c) $\dfrac{10}{17}$   d) $\dfrac{10}{19}$   e) NOTA


2.  Find the variance of the set X, where X={factors of 64}.

    a) 450.98   b) $\dfrac{22098}{49}$   c) 526.14   d) $\dfrac{3683}{7}$   e) NOTA


3.  Find the standard deviation of the following discrete distribution.  Round your answer to three decimal places.

| X | 4 | 9 | 12 | 15 | 17 | 21 |
|---|---|---|----|----|----|----|
| P(X) | .2 | .1 | .15 | .2 | .15 | .2 |

    a) 6.033   b) 5.821   c) 2.603   d) 2.377   e) NOTA


4.  Which of the following are true statements?
I.  If the significance level remains fixed, increasing the sample size will reduce the probability of a Type II error.
II.  The power of a test concerns its ability to detect an alternative hypothesis.
III.  The probability of a Type I error plus the probability of a Type II error always equals 1.

    a) I only   b) II only   c) I and II   d) I,II,III   e) NOTA


5.  Given the following information about two sets of data X and Y:
$\overline{X} = 56$, $s_x = 4$, $\overline{Y} = 64$, $s_y = 6$, find the mean and standard deviation of the set (X+2Y).  The answers are in the form (mean, standard deviation).

    a) (184,10)   b) (184,14)   c) (184,16)   d) $(184, 4\sqrt{10})$   e) NOTA


6.  Rob is investigating the shopping practices of a typical Publix shopper.  He wants to compare the purchases of daytime shoppers against evening shoppers.  He selects a random sample of 30 daytime and 30 evening shoppers.  The results of his samples are as follows:  the mean and standard deviation for daytime shoppers are $45.00 and $6.25, respectively.  The mean of the evening shoppers is $34.50 with a standard deviation of $4.75.  Using the appropriate chart, find the 95% confidence interval for the difference between daytime shoppers and evening shoppers.  Assume the difference to be positive and round each value of the interval to 3 decimal places.
    a) (7.569,13.430)   b) (7.569,13.431)   c) (7.573,13.426)   d) (7.573,13.427)   e) NOTA

7.  David, Ujas and Sam are working on a statistics question independently.  The probability that David will get the question correct is $\frac{3}{5}$.  The probability Ujas will get the question correct is $\frac{7}{12}$. The probability that Sam will get the question wrong is $\frac{2}{3}$.  Find the probability that at least one of the students will answer the question correctly.

$a)\ \frac{91}{180}$    $b)\ \frac{37}{60}$    $c)\ \frac{17}{18}$    $d)\ \frac{8}{9}$    $e)\ NOTA$

8.  Ellen is trying to find out the most popular store in the Coral Square Mall.  She has devised a plan of asking every seventh person who walks out the door what their favorite store is.  What type of sample does Ellen's plan follow?
a) systematic sample          b) simple random sample                    c) stratified sample
d) convenience sample                  e)  NOTA

9.  Which of the following are true statements?
I.  If a distribution is skewed to the right, its median is greater than its mean.
II.  In a stemplot the number of leaves equals the size of the set of data.
III.  Histograms do not retain the identity of individual scores.

$a)\ II\ only$    $b)\ III\ only$    $c)\ II,\ III$    $d)\ I,\ II,III$    $e)\ NOTA$

10.  In Dr. Morris' class, there are two grades for the semester:  the midterm exam and the final exam.  There is a linear relationship between the midterm exam score and the final exam score. The equation, $y = 3.4x - 125$, where x is the midterm exam score and y is the final exam score, describes this relationship.  Jordan is a student in Dr. Morris' class.  He earns a 70 on the midterm exam and a 90 on the final exam.  Calculate the value of Jordan's residual.

$a)\ \frac{115}{17}$    $b)\ 23$    $c)\ \frac{-115}{17}$    $d) -23$    $e)\ NOTA$

Use the following information for questions 11 and 12:    Mr. Scales gives a History test, and the results of his test form a normal distribution.  Kunal scores a 92 on the test, which places him at the 96.71 percentile.  Troy scores a 62, which places him at the 49.2 percentile.

11.  Using the appropriate chart, find the standard deviation of Mr. Scales' test.

$a)\ \frac{500}{31}$    $b)\ \frac{1500}{91}$    $c)\ 16.13$    $d)\ 16.48$    $e)\ NOTA$

12.  Using the appropriate chart, find the mean of Mr. Scales' test.

$a)\ \frac{1931}{31}$    $b)\ \frac{5612}{91}$    $c)\ 61.67$    $d)\ 62.32$    $e)\ NOTA$

13. Suppose that Paula guesses on each question of a ten question multiple choice quiz.  Each question has five choices.  Find the probability that Paula answers at least four and no more than seven questions correct.

$$a) \frac{3}{25} \quad b) \frac{151}{1250} \quad c) \frac{1171968}{9765625} \quad d) \frac{1179648}{9765625} \quad e)\ NOTA$$

14.  Given the following about two sets of data X and Y:  $\overline{X} = 7, s_x = 3, \overline{Y} = 20, s_y = 5$ and the line of best fit between X and Y is  $Y = \frac{1}{2}X + \frac{33}{2}$.  Find the coefficient of determination.

$$a) \frac{5}{6} \quad b) \frac{25}{36} \quad c) \frac{3}{10} \quad d) \frac{9}{100} \quad e)\ NOTA$$

15.  Given the following set of data X={1, 8, 13, 21, 17, 30, 17, 36, 25, 2}.  Let A={the mean of set X}, let B={the median of set X} and let C={the interquartile range of set X}.  Find the solutions of  $Ax^2 + Bx - C = 0$.

$$a) \frac{-1 \pm \sqrt{5}}{2} \quad b) \frac{1 \pm \sqrt{5}}{2} \quad c) \frac{-47 \pm \sqrt{8465}}{68} \quad d)\ No\ solution \quad e)\ NOTA$$

16.  Savannah is taking Dr. Fetcherin's International Business class.  The class grade is made up of four parts:  quizzes, presentations, the midterm exam and the final exam.  The quizzes are worth 20% of the grade, the presentations are worth 30% of the grade, the midterm exam is worth 15% of the grade and the final exam is worth 35% of the grade.  So far, Savannah has averaged a 90 on her quizzes, an 83 on her presentations, and a 94 on the midterm exam.  She is taking the final exam today.  What is the lowest possible grade Savannah can earn on the final exam to maintain a 90 percent average for the International Business class?

$$a)\ 93 \quad b)\ 94 \quad c) \frac{660}{7} \quad d)\ 95 \quad e)\ NOTA$$

17.  The results of the 2007 Statistics Topic Test form a normal distribution with a mean of 74 and a standard deviation of 8.  Using the appropriate chart, find the probability that a score is greater than 100 or less than 50.

$$a)\ .0006 \quad b)\ .0013 \quad c)\ .0019 \quad d)\ .9981 \quad e)\ NOTA$$

18.  Perry wants to know whether soda will sell equally well in any of six different locations in his grocery store.  Six displays of soda are built, one in each location, and the number of soda sold in each location are noted.

| Location | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Number sold | 82 | 61 | 50 | 75 | 42 | 68 |

Find the chi-square value that would help determine if location makes a difference.

$$a)\ 18.16 \quad b)\ 18.20 \quad c) \frac{1143}{63} \quad d)\ 19 \quad e)\ NOTA$$

19. Following are parts of the probability distributions for the random variables X and Y.

| X | P(X) | | Y | P(Y) |
|---|---|---|---|---|
| 1 | ? | | 1 | ? |
| 2 | ? | | 2 | ? |
| 3 | ? | | | |

Given that X and Y are independent and two joint probabilities are P(X=2, Y=1) = .16 and
P(X=2, Y=2) = .28, what is P(Y=2)?

   a) $\dfrac{3}{25}$   b) $\dfrac{11}{25}$   c) $\dfrac{4}{11}$   d) $\dfrac{7}{11}$   e) NOTA

20. How many of the following must always be positive?
I. Mean   II. Median    III. Standard Deviation  IV. Range   V.  Interquartile Range

   a) 1   b) 2   c) 3   d) 4   e) NOTA

21. At Shermer High School, 35% of the students are female.  40% of the female students go to
football games, and 25% of the male students do not go to football games.  Find the probability
of a student being male, given that the student goes to football games.

   a) $\dfrac{56}{251}$   b) $\dfrac{195}{251}$   c) $\dfrac{65}{149}$   d) $\dfrac{3}{4}$   e) NOTA

22. Mr. Smith is one of the worst free throw shooters ever.  He has a free throw percentage of
35%.  He is practicing in the gym until he makes one.  Find the standard deviation of Mr.
Smith's practice.

   a) $\dfrac{13}{7}$   b) $\dfrac{\sqrt{91}}{7}$   c) $\dfrac{260}{49}$   d) $\dfrac{2\sqrt{65}}{7}$   e) NOTA

23. There are a jar of M&M's on Mrs. Andrade's desk.  The students have particular color
preferences so when John goes to get an M&M, he discovers that there are 6 blue, 5 red, and 3
brown M&M's in the jar.  John randomly chooses two M&M's, one at a time and without
replacement.  Find the probability that the two M&M's are different colors.

   a) $\dfrac{4}{13}$   b) $\dfrac{9}{13}$   c) $\dfrac{9}{26}$   d) $\dfrac{17}{26}$   e) NOTA

24. The events A and B are independent.  P(A) = .67,  P(B) = .82.
    Find $P(A \cup B) - P(A \cap B)$.

   a) .3912   b) .51   c) .9406   d) 1.49   e) NOTA

25.  In a distribution that is skewed to the left, what is the relationship between the mean and the median?

a)  mean = median                b)  mean > median                c)  mean < median
d) not enough information to answer the question                e)  NOTA

26.  The following is information about the FCAT Math scores of Florida high school students based on a simple random sample of 750 students.  The hypotheses are
$H_o : \mu = 350, \ H_a : \mu > 350$.  Assume that the population standard deviation is $\sigma = 100$.  The test rejects $H_o$ at the 5% level of significance.  Using the appropriate chart, calculate the power of the test against the alternative $\mu = 360$.  Round your answer to four decimal places.

$a$) .7819    $b$) .7823    $c$) .8621    $d$) .8629    $e$) NOTA

27.  Researchers planning a study of the reading ability of fifth grade students want to obtain a 95% confidence interval for the population mean score on a reading test, with margin or error no greater than 4 points.  The researchers take the population standard deviation to be $\sigma = 10$.  Using the appropriate chart, find the minimum sample size that the researchers would need.
$a$) 16    $b$) 17    $c$) 24    $d$) 25    $e$) NOTA

28.  In a simple random sample of 93 teachers of AP Statistics, 71 said it was their favorite course to teach.  Using the appropriate chart, establish a 97% confidence interval for the proportion of all AP Statistics teachers who feel this way.  Round each endpoint of the interval to six decimal places.

$a$)(.667810, .859070)    $b$)(.667814, .859066)    $c$)(.667815, .859067)    $d$)(.667815, .859066)    $e$) NOTA

29.  What is a placebo?
$a$)  a parameter    $b$)  a statistic   $c$)  a method of selection
$d$) an experimental treatment     $e$)  NOTA

30.  Mrs. Lambert gives her Calculus final exam.  The results of the exam are a mean of 72 and a variance of 50.  She decides to curve the exam by multiplying everyone's score by 2 and subtracting 56.  Find the variance of the scores after she has curved the exam.
$a$)200   $b$)1936   $c$)10,000   $d$) No Solution    $e$) NOTA