All answers are exact unless a specific direction is asked for in the question.

1. In an exit poll taken at one Ohio polling place a simple random sample of n voters were asked which presidential candidate they voted for in the 2004 election. Using the data the 95% confidence interval for the true proportion of people who voted for John Kerry at this polling place was found to be (.50, .54). Find the tenths digit of ln n. (Assume that you can sample a fraction of a voter).

a) 6 *b*) 7 *c*) 8 *d*) 9 *e*) *NOTA*

2. Given the following facts, $P(A|B) = P(B|A) = P(A \cup B) = 0.4$, find: $P(A|B') + P(B|A')$

a) $\frac{4}{5}$ *b*) $\frac{1}{2}$ *c*) $\frac{2}{5}$ *d*) $\frac{4}{15}$ *e*) *NOTA*

3. If p is the probability that an event will occur on any trial, what is the probability that the event will occur at least twice in three trials?

a) $3p^3$ *b*) p^2 *c*) $3p^2 - 2p^3$ *d*) $3p^2$ *e*) *NOTA*

4. There are three boxes: Box 1 has two red balls and three white balls. Box 2 has three red balls and one white ball. Box 3 has four red balls and five white balls. A box is selected at random, then a ball is chosen at random from the selected box. Find the probability that the ball chosen is red.

a) $\frac{287}{540}$ *b*) $\frac{1}{2}$ *c*) $\frac{287}{1620}$ *d*) $\frac{253}{540}$ *e*) *NOTA*

5. A card is drawn from a standard deck. What is the probability that it is a prime number or a spade?

a) $\frac{1}{2}$ *b*) $\frac{25}{52}$ *c*) $\frac{6}{13}$ *d*) $\frac{23}{52}$ *e*) *NOTA*

6. Allison averages 82% on her first six tests. What must she average on her next four tests to have an overall average of at least 88%?

a) 95 *b*) 96 *c*) 97 *d*) 98 *e*) *NOTA*

7. 2% of light bulbs made by a company are defective. From a random sample of 500 light bulbs, what is the probability that 7 will be defective? Round your answer to four decimal places.

a) .0898 *b*) .0899 *c*) .0900 *d*) .0901 *e*) *NOTA*

8. Given the following set of data analysis, find the equation of the least-squares line in slope intercept form:

$r = .75 \quad \bar{X} = 62 \quad \bar{Y} = 95 \quad S_x = 3 \quad S_y = 6$

a) $y = \frac{3}{8}x + 95$ *b*) $y = \frac{3}{2}x + 95$ *c*) $y = \frac{3}{8}x + \frac{287}{4}$ *d*) $y = \frac{3}{2}x + 2$ *e*) *NOTA*

9. Tanquyen, Nabill and Brian work independently to solve a problem. If their respective probabilities that they will solve it are ¼ , ⅓, and ½ , what is the probability that the problem will be solved?

a) $\frac{1}{4}$ *b*) $\frac{1}{24}$ *c*) $\frac{3}{4}$ *d*) $\frac{1}{9}$ *e*) *NOTA*

10. Which of these statistical measures are resistant?

a) Mean b) Standard Deviation c) correlation coefficient d) Median e) NOTA

Given the following set of data, answer questions 11-12.

At Deerfield Beach High, 130 students take Math, 150 take English and 200 take Science. 60 take English and Science, 70 Math and English and 90 take Math and Science. 40 students take all three classes. Each student takes at least one class.

11. Find the number of students who take Math only.

a) 0 b) 10 c) 20 d) 30 e) NOTA

12. Find the probability of a student randomly selected taking Science only, given that they are in Science.

a) $\frac{2}{3}$ *b*) $\frac{7}{10}$ *c*) $\frac{9}{20}$ *d*) $\frac{3}{10}$ *e*) *NOTA*

13. Which of the following are true statements?
I. The range of the sample data is never greater than the range of the population.
II. The interquartile range is one-half the distance between the first and third quartile.
III. While the range is affected by outliers, the interquartile range is not.

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

14. Find the standard deviation of the following distribution to two decimal places:

Temperature	540	545	550	555	560
Probability	0.1	0.25	0.3	0.25	0.1

a) 5.70 *b*) 5.60 *c*) 32.50 *d*) 5.50 *e*) *NOTA*

15. Which of the following statements are true?
I. The mean and median of a normal distribution are equal.
II. The standard deviation of a set of data is always positive.
III. The variance of a set of data is the square root of the standard deviation of the data.

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

16. The distribution for a bag of Skittles is as follows:
30% Red, 20% Green, 20% Orange, 10% Yellow, 10% Purple, 10% Blue
In a bag of Skittles are the following counts:
13 Red, 20 Green, 5 Orange, 5 Yellow, 4 Purple, 3 Blue

Calculate the chi-square value for this distribution and round your answer to two decimal places.

a) 13.76 *b*) 13.77 *c*) 11.89 *d*) 11.90 *e*) *NOTA*

17. The average yearly rainfall in Colorado Springs is 60 inches. What is the standard deviation if 10.2% of the years have rainfall above 75 inches? Assume yearly rainfalls are normally distributed. Round your answer to two decimal places.

a) 7.65 *b*) 8.00 *c*) 8.92 *d*) 11.81 *e*) *NOTA*

18. Following are parts of the probability distribution for the random variables X and Y.

X	*P(X)*
1	?
2	?
3	?
4	?

Y	*P(Y)*
1	?
2	?

If X and Y are independent and the joint probabilities $P(X = 1, Y = 1) = 0.14$ and $P(X = 1, Y = 2) = 0.06$, then what is $P(Y = 2)$?

a) .08 *b*) .2 *c*) .3 *d*) .7 *e*) *NOTA*

19. Stacy wants to know what percentage of students support her position on the issue of theatre classes for every student. What size student sample should be obtained to determine with 90% confidence the support level to be within 4%?

a) 21 *b*) 25 *c*) 423 *d*) 600 *e*) *NOTA*

20. Suppose you wish to compare the AP Statistics exam results for the male and female students taking the course at your school. What is the most appropriate technique for getting the needed data?

a) Census b) Sample survey c) Experiment d) Observational Study e) NOTA

21. Which of the following are true statements?
I. The probability of a Type II error does not depend on the probability of a Type I error.
II. In conducting a hypothesis test, it is possible to simultaneously make both a Type I and Type II error.
III. A Type II error will result if one incorrectly assumes the data are normally distributed.

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

22. What is a placebo?

a) a method of selection b) an experimental treatment c) a control treatment d) a statistic e)NOTA

23. The number of days it takes to create a new scrapbook has of variance of 386. A sample of 40 new scrapbooks shows an average creating time of 83 days. With what confidence can we assert that the average creating time for a new scrapbook is between 80 and 90 days? Use the charts provided and round the percentage to one decimal place.

a) 15.4% *b*) 38.8% *c*) 78.1% *d*) 82.2% *e*) *NOTA*

24. If the correlation coefficient $r = .84$, what percentage of variation in y is explained by variation in x? Round your answer to two decimal places.

a) .84 *b*) .71 *c*) .70 *d*) .16 *e*) *NOTA*

25. Shermer High School wants to find out what kinds of transportation its students use to get to school. It conducts a survey of 537 students and 243 say they ride the bus. Construct a 95% confidence interval for the proportion of students who ride the bus to and from school. Round your answers to six decimal places.

a) (.410415, .494613) *b)* (.410414, .494613) *c*) (.410420, .494610) *d)* (.410415, .494612) *e*) *NOTA*

26. Which of the following are true of hypothesis tests?
I. You must state null and alternative hypotheses in the context of the problem.
II. You must state a significance level so you can decide if a given P-value gives you evidence to reject the null hypothesis.
III. You must state a conclusion in the context of the problem.

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

27. Find the mean and the standard deviation of the following data. Round each value to two decimal places.

Value	3	4	6	7	9	10
Frequency	2	1	9	4	4	6

a) $(7.23, 2.18)$ *b*) $(7.23, 2.14)$ *c*) $(4.82, 2.36)$ *d*) $(4.82, 2.88)$ *e*) *NOTA*

28. For the set of the first fifteen positive prime integers, let A= maximum of the set, let B= minimum of the set, let C= median of the set and let D= interquartile range of the set. Find the value of $\frac{(A-B)C}{D}$.

a) 30 *b*) $\frac{323}{10}$ *c*) $\frac{115}{3}$ *d*) $\frac{57}{2}$ *e*) *NOTA*

29. A high school athletic director claims that the average 3 mile time for students trying out for school cross country is 17 minutes. A coach believes the true figure is lower. The coach picks an SRS of 30 recruits and calculates their mean 3 mile time is 16 minutes 52 seconds, with a standard deviation of 25 seconds. What is the P-value for the appropriate test? Round your answer to two decimal places.

a) .04 *b*) .05 *c*) .75 *d*) .95 *e*) *NOTA*

30. Suppose X and Y are random variables with $\mu_x = 45, \sigma_x = 5, \mu_y = 30$ and, $\sigma_y = 12.$. What are the mean and standard deviation of the random variable X + Y?

a) $\mu_{x+y} = 75,\ \sigma_{x+y} = 8.5$ *b)* $\mu_{x+y} = 75,\ \sigma_{x+y} = 13$ *c)* $\mu_{x+y} = 75,\ \sigma_{x+y} = 17$ *d)* $\mu_{x+y} = 37.5,\ \sigma_{x+y} = 13$ *e)NOTA*