DSST® PRINCIPLES OF STATISTICS

EXAM INFORMATION

This exam was developed to enable schools to award credit to students for knowledge equivalent to that learned by students taking the course. This exam tests the understanding of the principles and concepts underlying higher-order statistics, continuous and discrete distributions, use of predictive statistics using the linear model, and confidence intervals.

The exam contains 100 questions to be answered in 2 hours.

The use of nonprogrammable calculators is permitted during the test. Scratch paper for computations will be provided. A calculator function is available during computer-based exams.

EXAM CONTENT OUTLINE

The following is an outline of the content areas covered in the examination. The approximate percentage of the examination devoted to each content area is also noted.

I. **Foundations of Statistics – 20%**
    a. Data types and levels of measurement, sample vs. population, and distribution
    b. Sampling methods
    c. Descriptive statistics
    d. Visual representation of data

II. **Probability – 15%**
    a. Basic concepts
    b. Probability rules for dependent and independent events
    c. Combinations and permutations
    d. Discrete distributions
    e. Continuous distributions

III. **Correlation and Regression – 20%**
    a. Scatter plots
    b. Linear correlation
    c. Linear regression
    d. Prediction using the linear mode

IV. **Sampling Distributions – 20%**
    a. Basic understanding of standard scores such as Z and T scores
    b. The law of averages, expected values, standard error, normal approximation, sample size, sample average and estimating accuracy of a sample
    c. Central limit theorem

V. **Inferential Statistics – 25%**
    a. Confidence intervals
    b. Null and alternate hypothesis, confidence level and power
    c. Type i and type ii errors and levels of significance
    d. Inference for the mean or the proportion of a population
    e. Comparing two sample means and proportions
    f. Comparing the means of more than two samples
    g. Non-parametric

REFERENCES

Below is a list of reference publications that were either used as a reference to create the exam, or were used as textbooks in college courses of the same or similar title at the time the test was developed. You may reference either the current edition of these titles **or** textbooks currently used at a local college or university for the same class title. It is recommended that you reference **more than one textbook** on the topics outlined in this fact sheet.

You should **begin by checking textbook content against the content outline** provided **before** selecting textbooks that cover the test content from which to study.

Sources for study material are suggested but not limited to the following:

1. *Introduction to the Practice of Statistics*, Fifth Edition, 2006, David Moore and George McCabe, W.H. Freeman and Company, 41 Madison Avenue, New York, NY 10010, www.whfreeman.com.

2. *Statistics*, Fourth Edition, 2007, David Freedman, Robert Pisani and Roger Purves, W.W. Norton & Company, 500 Fifth Avenue, New York, NY 10110, www.wwnorton.com.

SAMPLE QUESTIONS

All test questions are in a multiple-choice format, with one correct answer and three incorrect options. These are samples of the types of questions that may appear on the exam. Other sample questions can be found in the form of practice exams by visiting our website at **www.getcollegecredit.com/testprep.**

Certain words, concepts, and symbols on this exam are defined as follows:

Average = arithmetic mean
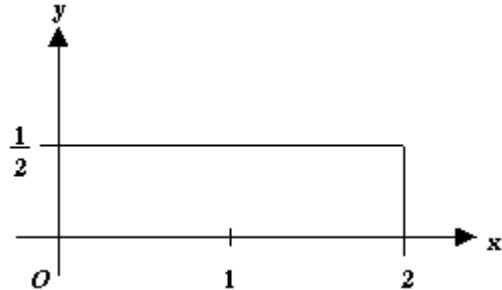Correlation = linear correlation
SD = standard deviation
Rms = root-mean-square = $\sqrt{\dfrac{\sum x^2}{n}}$

Area of a rectangle with adjacent edges a and $b = a.b$

Area of a triangle with base b and corresponding altitude $h = \frac{1}{2} b.h$

1. A 100 question multiple-choice exam has 4 choices for each question. If a student selects all choices randomly, how many correct answers could the student expect?
   a. 4
   b. 8
   c. 25
   d. 40

2. Each of the following statements is true for all probability curves for random variable x EXCEPT:
   a. the area under the curve is 1
   b. the highest point on the curve occurs at the average
   c. the curve does not cross the x-axis
   d. the probability that x is between a and b is equal to the area of the region bounded by the curve, the x-axis, and the lines $x = a$ and $x = b$

3. Which of the following could NOT be the value of a correlation coefficient?
   a. -1
   b. 0
   c. 1
   d. 2

4. The average and SD of a set of 50 scores are 30 and 7, respectively. If each of these scores is increased by 10, then which of the following is true for the new set of scores?
   a. The average is 60
   b. The average is 40
   c. The SD is 17
   d. The SD is 7.2

5. A bag contains 15 marbles, of which 8 are red, 5 are blue, and 2 are white. Two marbles are drawn randomly from the bag one after the other, without replacement. What is the probability that both marbles are red?

   a. 4/15
   b. 64/225
   c. 32/105
   d. 8/15

6. If the figure above is a probability histogram, what is the probability that $x \geq \frac{1}{2}$?
   a. 1/4
   b. 1/2
   c. 5/8
   d. 3/4

7. Which of the following pairs of parameters is sufficient to define a specific normal curve?
   a. The average and the standard deviation
   b. The range and the standard deviation
   c. The average and the chi-square (x^2)-value
   d. The standard deviation and the chi-square (x^2)-value

8. A balanced diet is rolled 4 times. What is the probability that a six will NOT appear on any roll?
   a. $(5/6)^4$
   b. $6 (5/6)^4$
   c. $5/6$
   d. $1 - (1/6)^4$

9. If H_o is the null hypothesis and P is the observed (computed) significance level, then
   a. "small" values of P are evidence for H_o
   b. "small" values of P are evidence against H_o
   c. "small" values of P give no information for or against H_o
   d. a rejected H_o "corresponds to a negative value of P"

10. A random sample of 100 values of x is taken from a distribution whose SD is k. What will be the approximate value of the standard error of the average of x?
    a. 0.01k
    b. 0.1k
    c. 0.5k
    d. k

CREDIT RECOMMENDATIONS

The American Council on Education's College Credit Recommendation Service (ACE CREDIT) has evaluated the DSST test development process and content of this exam. It has made the following recommendations:

Area or Course Equivalent	Principles of Statistics
Level	Lower-level baccalaureate
Amount of Credit	Three (3) semester hours
Minimum Score	400
Source	American Council on Education – College Credit Recommendation Service

Answers to sample questions: 1-C; 2-B; 3-D; 4-B; 5-A; 6-D; 7-A; 8-A; 9-B; 10-B.

Rev 3/14