Principles of Statistics
Fact Sheet 2008

TEST INFORMATION

This test was developed to enable schools to award credit to students for knowledge equivalent to that which is learned by students taking the course. The school may choose to award college credit to the student based on the achievement of a passing score. The ultimate passing score for each examination is determined by the school. The school is provided with a recommended passing score established by a national committee of college faculty who teach this course. The DSST program is approved by the American Council on Education (ACE), and the ACE provides both a recommended passing score and a recommended number of credits that could be awarded to successful students. Some schools set their own standards for awarding credit and may require a higher score than the ACE recommendation. Students should obtain this information from the institution from which they expect to receive credit.

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.

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.

> **Principles of Statistics**
> **Exam Content Outline**

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

The following references were used to create exam questions and may be useful as study materials. You are not allowed to use these references in the testing center.

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. You may want to review these samples for the type of questions that may appear on the exam.

Certain words, concepts, and symbols on this test 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 test 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
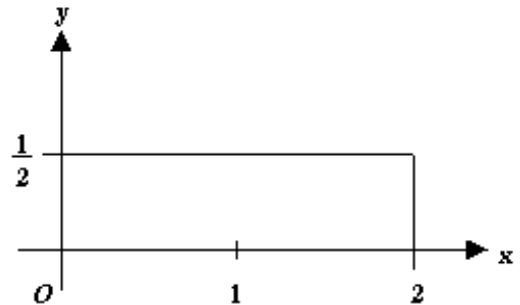
6. If the figure above is a probability histogram, what is the probability that $x \geq 1/2$?
   A. 1/4
   B. 1/2
   C. 5/8
   D. 3/4

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 die 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

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

CREDIT RECOMMENDATIONS

The Center for Adult Learning and Educational Credentials of the American Council on Education (ACE) has reviewed and evaluated the DSST test development process and has made the following recommendations:

Area or Course Equivalent	Principles of Statistics
Level	Lower level baccalaureate
Amount of Credit	Three (3) semester hours
Source	ACE Commission on Education Credit and Credentials

It is advisable that schools develop a consistent policy about awarding credit based on scores from this test and that the policy be reviewed periodically. Prometric will be happy to help schools in this effort.

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