



Course: Business Statistics (20116)
Term: Winter term 2013/14
Examiner: PD Dr. Annette Kirstein
Date: 13.02.2014

Final Examination

First name:

Last name:

Matriculation number: _ _ _ _ _
(up to 9 digits)

Available time: 60 minutes

Maximum points: 60 points

Permitted aid(s):

- Non-programmable pocket calculator *without data storage and communication capabilities*
- Formula Sheet, individually printed at home and brought to the final exam (4 pages formulas + 5 pages distribution tables), **no further notes (handwritten or printed) allowed on the Formula Sheet!**

General information:

1. There are 20 questions all together. In all questions *one out of four* answers is correct.
2. In each question points are given as follows:
If you mark only correct: points cf.problem
If you mark only wrong: 0 points
If you mark correct and wrong / nothing: 0 points
3. Feel free to use the empty space on the present exam for your personal calculations or notes. But note that *whatever you write on these pages will be ignored during correction! Only the answer sheet will be evaluated.*
4. Points given for correct solutions correspond to the processing time assigned (in minutes).
5. **Return all the paper you received or used** (without exception).

GOOD LUCK!

1. **Data and Statistics. (2 points)** Qualitative data
 - a. must be numeric
 - b. must be nonnumeric
 - c. cannot be numeric
 - d. may be either numeric or nonnumeric

2. **Data and Statistics. (2 points)** The summaries of data, which may be tabular, graphical, or numerical, are referred to as
 - a. inferential statistics
 - b. descriptive statistics
 - c. statistical inference
 - d. report generation

3. **Descriptive Statistics. (2 points)** A histogram is said to be skewed to the left if it has a
 - a. longer tail to the right
 - b. shorter tail to the right
 - c. shorter tail to the left
 - d. longer tail to the left

4. **Descriptive Statistics. (2 points)** A tabular method that can be used to summarize the data on two variables simultaneously is called
 - a. simultaneous equations
 - b. crosstabulation
 - c. a histogram
 - d. an ogive

5. **Excel. (2 Points)** The Excel function TDIST(. ; . ; .) calculates the test statistic for a hypothesis test based on a
 - a. t distribution
 - b. standard normal distribution
 - c. F distribution
 - d. none of these alternatives is correct

6. **Probabilities. (2 points)** If two events are independent, then
 - a. they must be mutually exclusive
 - b. the sum of their probabilities must be equal to one
 - c. their intersection must be zero
 - d. none of these alternatives is correct.

7. **Probabilities. (4 points)** Assume you have applied for two scholarships, a Merit scholarship (M) and an Athletic scholarship (A). The probability that you receive an Athletic scholarship is 0.18. The probability of receiving both scholarships is 0.11. The probability of getting at least one of the scholarships is 0.3. The probability of receiving the Athletic scholarship given that you have been awarded the Merit scholarship is
 - a. 0.23
 - b. 0.611
 - c. 0.0414
 - d. 0.4783

8. **Probability distributions. (2 points)** In the textile industry, a manufacturer is interested in the number of blemishes or flaws occurring in each 100 feet of material. The probability distribution that has the greatest chance of applying to this situation is
- the normal distribution
 - the binomial distribution
 - the Poisson distribution
 - the uniform distribution
9. **Normal probability distribution. (4 points)** The weight of items produced by a machine is normally distributed with a mean of 8 and a standard deviation of 2 ounces. What is the probability that a randomly selected item will weigh more than 10 ounces?
- 0.3413
 - 0.8413
 - 0.1587
 - 0.5000
10. **Normal probability distribution. (4 points)** Given that Z is a standard normal random variable, what is the value of Z if the area between $-Z$ and Z is 0.901?
- 1.96
 - 1.96
 - 0.4505
 - ± 1.65
11. **Sampling. (2 points)** As the sample size becomes larger, the sampling distribution of the sample mean approaches a
- binomial distribution
 - Poisson distribution
 - normal distribution
 - chi-square distribution
12. **Sampling. (4 points)** Random samples of size 49 are taken from a population that has 20,000 elements, a mean of 180, and a variance of 196. The distribution of the population is unknown. The mean and the standard error of the mean are
- 180 and 24.39
 - 180 and 28
 - 180 and 2
 - 180 and 1.74
13. **Interval Estimation. (4 points)** The sample size needed to provide a margin of error of 2 or less with a .95 probability when the population standard deviation equals 11 is
- 10
 - 11
 - 116
 - 117
14. **Hypothesis tests. (2 points)** If a hypothesis is not rejected at the 5% level of significance, it
- will also not be rejected at the 1% level
 - will always be rejected at the 1% level
 - will sometimes be rejected at the 1% level
 - none of these alternatives is correct.

15. **Hypothesis test on population mean. (4 points)** The management of a department store is interested in estimating the difference between the mean credit purchases of customers using the store's credit card versus those customers using a national major credit card. You are given the following information.

	Store's Card (x_1)	Major Credit Card (x_2)
Sample size	64	49
Sample mean	\$140	\$125
Population standard deviation	\$10	\$8

A 95% confidence interval estimate for the difference between the average purchases of the customers using the two different credit cards is

- 49 to 64
 - 11.68 to 18.32
 - 125 to 140
 - 8 to 10
16. **Inferences about population variances. (4 points)** We want to test the hypothesis that population A has a larger variance than population B.

	Sample A	Sample B
s^2	12.1	5
n	9	10

The p -value is approximately

- 0.10
 - 0.05
 - 0.025
 - 0.01
17. **ANOVA. (4 points)** Part of an ANOVA table is shown below.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Between Treatments	180	3		
Within Treatments (Error)				
<hr/>				
TOTAL	480	18		

The test statistic is

- 2.25
- 6
- 2.67
- 3

18. **ANOVA. (2 points)**

In an analysis of variance, one estimate of σ^2 is based upon the differences between the treatment means and the

- a. means of each sample
- b. overall sample mean
- c. sum of observations
- d. none of these alternatives is correct

19. **Simple linear regression. (4 points)**

You are given the following information about y and x.

y Dependent Variable	x Independent Variable
12	4
3	6
7	2
6	4

The least squares estimate of b_0 equals

- a. 1
- b. -1
- c. -11
- d. 11

20. **Non-parametric tests. (4 points)** The Spearman rank-correlation coefficient for 20 pairs of data when $\sum d_i^2 = 50$ is.

- a. 0.0063
- b. 0.0376
- c. 0.9624
- d. 0.9937