Concordia University
John Molson School of Business

Department of Decision Sciences and Management Information Systems

COMM 215 Business Statistics

Section BX

Summer 2012

Final Examination

August 2012

Last Name: _____ First Name_____

(Please Print)

Student No.:_____

INSTRUCTIONS

1. **Attempt all questions**. Show your work for FULL credit.
2. This is a **closed book**, **closed note** examination. You are allowed to use standard, basic calculators during the examination. Sharing of calculators is not allowed. **DO NOT DETACH pages**. Return the exam booklet intact.

3. For **PART I - Multiple Choice Questions:**
   a. Use **PENCIL** to **fill** the appropriate circles on the blue sheet corresponding to the correct answer choices.
   b. Use **PENCIL** to **write** your full name and Student ID, and to **fill** the matching circles below your name and ID on the blue sheet.

4. For **PART II – Problem Solving:**
   a. Use **PEN** **to write your answers in the space provided** below each question.
   b. You may use both sides of the paper if necessary**.** Do not include extra pages**.**

5. Tables and formulas are appended. **DO NOT DETACH THEM FROM THE BOOKLET.**
6. No questions about the examination are allowed**.**

		Marks obtained
Part I	Sub-Total	/48
Part II		
	Question 1	/14
	Question 2	/12
	Question 3	/12
	Question 4	/14
	Sub-Total	/52
Total		100

PART I: Multiple choice questions (<u>one mark</u> for each of questions 1 to 20 and <u>two marks</u> for each of questions 21 to 34). Some of the numbers in the provided choices have been rounded.

<u>Indicate your answers on the multiple choice answer sheet provided</u>. Use pencil only to make black marks that fill the circle completely. Erase cleanly any answer you wish to change. Make no stray marks on the answer sheet.

1. Which of the following statements is true regarding a simple linear regression model?
   a) The proportion of variation explained is the correlation coefficient
   b) SSR must be greater than SSE if the coefficient of determination is larger than 0.5
   c) The slope coefficient must have the same sign as the coefficient of determination
   d) None of the suggested answers are correct

2. Which of the following statements is true?
   a) The central limit theorem states that no more than75% of the observations lie within 2 standard deviations of the mean
   b) The central limit theorem states that the sampling distribution of the mean will be approximately normal regardless of the shape of the population distribution as the sample size becomes large.
   c) The central limit theorem states that the standard error of the sampling distribution of the mean can be approximated by $\sigma / \sqrt{n}$ as long as the population distribution is symmetric.
   d) The population must be normal and that σ is not known for the central limit theorem to be valid.

3. In order to use the normal distribution for interval estimation of μ when σ is known and the sample is very small,
   a) the population must have a t-distribution with at most 30 degrees of freedom
   b) The population coefficient of variation must be small
   c) The sample standard deviation must be equal to the population standard deviation
   d) None of the suggested answers are correct

4. An interval estimate for the mean is a range of values used to estimate
   a) the sample mean
   b) the sampling distribution
   c) sampling error, or the difference between the population mean and the sample mean
   d) None of the suggested answers are correct

5. Forty shoppers were asked if they preferred the weight of a can of soup to be 6 ounces, 8 ounces, or 10 ounces. Below you are given their responses.

6	6	6	10	8	8	8	10	6	6
10	10	8	8	6	6	6	8	6	6
8	8	8	10	8	8	6	10	8	6
6	8	8	8	10	10	8	10	8	6

   Which of the following is an appropriate graphical display of the above data?
   a) Bar chart
   b) Normal distribution curve
   c) Box plot
   d) None of the suggested answers are correct

6. Four hundred people were asked whether gun laws should be more stringent. Three hundred said "yes," and 100 said "no." The point estimate of the proportion in the population who will respond "no" is
   a) 25
   b) calculated as 0.25 minus sampling error as determined from the sample
   c) 0.75
   d) None of the suggested answers are correct

7. In determining the sample size necessary to estimate a population proportion, which of the following information is not needed?
   a) the maximum margin of error that can be tolerated
   b) the confidence level required
   c) a preliminary estimate of the true population proportion P
   d) whether or not the population is symmetrically distributed

8. Since the population is always larger than the sample, the value of the sample mean
   a) is always smaller than the true value of the population mean
   b) is always larger than the true value of the population mean
   c) is always equal to the true value of the population mean
   d) could be larger, equal to, or smaller than the true value of the population mean

9. Sampling distributions are:
   a) the probability distributions of population parameters.
   b) the probability distributions of sample statistics.
   c) referring to the standard errors of sample statistics
   d) None of the suggested answers are correct

10. Last year, 55% of MNM, Inc. employees were female. It is believed that there has been a reduction in the percentage of females in the company. Which of the following gives the correct null and alternative hypotheses in testing the belief?
    a) The correct hypotheses are: $H_0 : p \leq 0.55$ and $H_a : p > 0.55$
    b) The correct hypotheses are : $H_0 : p \geq 0.55$ and $H_a : p < 0.55$
    c) The null and alternative hypotheses cannot be set up because no sample information is given
    d) None of the suggested answers are correct

Refer to the following in answering questions 11 to 13

In a large corporation, sixty-two percent of the employees are male. Twenty-three percent of the employees earn more than $30,000 a year. Eighteen percent of the employees are male and earn more than $30,000 a year. Suppose that an employee is selected at random. Let A be the event that the selected employee is a male and B the event that the employee earns more than $30,000 a year.

11. Given that the selected employee is a female, what is the probability that the employee will earn $30,000 or less?
    a) 38/77
    b) 0.33
    c) 33/38
    d) None of the above is a correct answer

12. Which of the following statements is not true?
    a) $P(A)P(A|B)=P(B)P(B|A)$
    b) $P(A \cup B) < P(A) + P(B)$
    c) $P(A \mid B^c) = P(B \mid A^c)$
    d) All of the above are true

13. Which of the following statements is true?
    a) A and B are independent
    b) A and B are mutually exclusive
    c) A and B cannot occur at the same time
    d) None of the suggested answers are correct

14. There is a need to estimate the average total compensation of CEO's in the Service industry. Data were randomly collected from 18 CEO's and the 97% confidence interval was calculated to be ($2,181,260, $5,836,180). Which of the following interpretations is correct?
    a) 97% of the sampled total compensation values fell between $2,181,260 and $5,836,180.
    b) In the population of Service industry CEO's, 97% of them will have total compensations that fall in the interval $2,181,260 to $5,836,180.
    c) We are 97% confident that the mean of the sampled CEO's falls in the interval $2,181,260 to $5,836,180.
    d) None of the suggested answers are correct

15. A sample of account balances from a credit company showed an average daily balance of $1,040. The standard deviation of the population is known to be $200. We are interested in determining if the mean of all account balances (i.e., population mean) is different from $1,000. A statistician reported a value of the z statistic of 1.6. Which of the following statements is true?
    a) There is insufficient information to determine the p-value since the sample size is not given
    b) The p-value is equal to 0.0548
    c) The p-value is equal to 0.0274
    d) None of the suggested answers are correct

16. If a new independent variable is added to an existing regression equation, then the resulting sample regression equation
    a) will have a SSE no bigger than that of the original sample regression equation
    b) will have a smaller coefficient of determination
    c) will have a smaller SSR
    d) None of the suggested answers are correct

17. Consider a distribution of ten account balances with a mean balance of $620. If an eleventh account with a balance of $400 is added to the group, what is the mean balance for the new group consisting of eleven accounts?
    a) $600
    b) $510
    c) $586
    d) cannot be determined with the given information