# COR1-GB.1305
# SAMPLE MIDTERM

Name:_____

This is the answer sheet. Circle the choice which best answers each question on the exam. Do not write anything else on this sheet (besides your name and the circles). When you are finished, hand in just this answer sheet. You can keep the question sheets. There are 15 questions, each worth 5 points. Everyone receives 25 points for free. Good Luck!

1) (A) (B) (C) (D) (E)

2) (A) (B) (C) (D) (E)

3) (A) (B) (C) (D) (E)

4) (A) (B) (C) (D) (E)

5) (A) (B) (C) (D) (E)

6) (A) (B) (C) (D) (E)

7) (A) (B) (C) (D) (E)

8) (A) (B) (C) (D) (E)

9) (A) (B) (C) (D) (E)

10) (A) (B) (C) (D) (E)

11) (A) (B) (C) (D) (E)

12) (A) (B) (C) (D) (E)

13) (A) (B) (C) (D) (E)

14) (A) (B) (C) (D) (E)

15) (A) (B) (C) (D) (E)

1) The relationship between a statistic and a parameter is as follows:
   A) The statistic is a forecast of the parameter.
   B) The statistic is always equal to the parameter.
   C) The statistic is an estimate of the parameter.
   D) The parameter is an estimate of the statistic.
   E) None of the above.

2) A single die (with six faces) is going to be thrown. Let A={A five is thrown}, B={A six is thrown}. The two events A, B are
   A) Independent B) Mutually Exclusive
   C) Impossible D) None of the Above.

3) If A, B are independent events, then $P(A \cup B)$ is equal to:
   A) $P(A)+P(B)$
   B) $1-P(A)$
   C) $1-[P(A)+P(B)]$
   D) $P(A)+P(B)-P(A)\,P(B)$
   E) None of the Above

4) Suppose that 60% of US residents are happy, and 40% of US residents are married. Also, suppose that 75% of married US residents are happy. What proportion of happy US residents are married?
   A) 40% B) 50% C) 60% D) 70% E) 75%

5) In Problem 4, the events {Happy} and {Married} are
   A) Independent B) Mutually Exclusive C) Complements of each other
   D) Dependent E) None of the Above.

6) Consider a fair game (expected profit is zero) where in each round a biased coin is tossed twice, independently. If both tosses are Heads, the player wins $8. Otherwise, the player loses $1. If the coin has probability $p$ of coming up heads on any given toss, then what is the value of $p$?
   A) 1/9 B) 1/3 C) 8/9 D) 2/3 E) None of the Above.

7) Consider an investment that returns $15 with probability .4, and returns −$10 with probability .6. What is the theoretical standard deviation for this investment?
   A) $0 B) $150 C) $12.25 D) $25 E) None of the Above.

Questions 8 and 9 refer to a large batch of new batteries, of which 10% are defective.

8) If you select ten batteries at random from the batch, what is the probability that at least three will be defective? (Use the appropriate table.)
A) 1 B) .0128 C) .0702 D) .9872 E) .9298

9) Suppose that you select 100 batteries at random from the batch, and find that 12 are defective. The z-score corresponding to this observation is:
A) –3.30 B) 1.56 C) 3.54 D) 3.30 E) 0.667

10) The probability that a standard normal random variable will be between –2 and 2 is:
A) .4772 B) .3413 C) .9544 D) .6826 E) 0

11) The probability that a normal random variable with mean 10 and standard deviation 2 will be between 8 and 12 is:
A) .3413 B) .3944 C) .7888 D) 0 E) .6826

12) If X is normally distributed with mean 1 and standard deviation 5, the probability that the Z-score corresponding to X will be between –1 and 2 is:
A) .3413 B) .4772 C) .8185 D) .1554 E) .2347

13) Suppose the duration of telephone calls has mean 3 minutes and variance 100 minutes. You are going to take a random sample of size 10 from the set of all calls made next year, and calculate the sample mean. What is the standard error of the mean call duration?
A) .03 B) 31.6 C) 3.16 D) 3 E) 10

14) Suppose that annual salaries (in thousands of dollars) for managers at a large company have a mean of 300 and a standard deviation of 50. If 30 managers are selected at random, what is the probability that their average salary exceeds 280?
A) .9857 B) .6554 C) .0143 D) .3446 E) None of the Above.

15) True or False: The Central Limit Theorem is still valid even if the population distribution has more than one peak.
A) True. B) False.