STAT-UB 103
SAMPLE MIDTERM 2

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). 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)

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1) Can the following table be a discrete probability distribution?

x	0	1	2	3
$p(x)$	0.2	0	0.9	-0.1

A) Yes B) No

2) Suppose a random variable X has the following discrete probability distribution:

X	0	1	2
$p(x)$	0.2	0	0.8

The expected value of X is:

A) 0 B) .5 C) 1 D) 2 E) 1.6

3) Consider a game where a coin is tossed twice. If both tosses are Heads, you win $1, and otherwise you lose $1. Your expected winnings for this game are:
A) Zero B) –1 Dollar C) 1 Dollar D) –50 cents E) 50 cents

4) A telephone area code consists of three digits. How many different area codes are possible, if no area code can start with 0 or 1?
A) 100 B) 1,000 C) 120 D) 800 E) 28

5) A poker hand consists of five cards dealt from a fresh deck. How many hands are a straight, that is, five consecutive cards of any suit? (The lowest card in a straight cannot be an ace). (For this problem, straight flushes are considered straights).
A) 9 B) 36 C) 9216 D) 1,105,920 E) 144

6) Suppose you have been given a list of 10 books which you must read for a literature course. The professor has told you that for this month, you should pick any three of these books and read them. You need to submit a list of the 3 books you will read this month. The professor doesn't care in what order you read the books. How many different lists could you submit?
A) 6 B) 3 C) 10 D) 720 E) 120

Questions 7, 8, and 9 refer to a large batch of new batteries, of which 10% are defective.

7) If you select five batteries at random from the batch, what is the probability that at least two will be defective?
A) 1 B) .0815 C) .0086 D) .9185 E) .9914

8) If you select 50 batteries at random from the batch, what is the probability that at most 5 will be defective?
A) .5900 B) .4909 C) .4484 D) .2214 E) .4004

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 WeChat video calls has mean 30 minutes and variance 100 minutes. You are going to take a sample of size 10 from the set of all WeChat video calls made last year, and calculate the sample mean duration. What is the standard error of the mean call duration?
A) .03 B) 31.6 C) 3.16 D) 3 E) 10

14) For the situation described in Problem 14, what is the probability that the mean duration will fall between 28 and 31 minutes?
A) .3612 B) .4660 C) .1191 D) .2995 E) .4406

15) Your favorite basketball team has been winning 55% of its games. Calculate the probability that they will have at least one losing streak of 10 games in a row at some point in the next 200 games.
A) .219 B) .327 C) .036 D) .641 E) .781