Problem 1 (10 points)

How many possible combinations of answers to a 10-question true/false test are there? Assume that being correct is not a requirement in answering any of the questions.

Problem 2 (10 points)

A student has a combination lock requiring three numbers, ranging from 1 to 9 each, subject to the condition that any number in the combination can’t be repeated. How many different lock combinations are possible?
Problem 3 (10 points)

How many different ways can you rearrange the letters in the word, BOSTON? (Hint: There are six letters but two of them are duplicated.)

Problem 4 (25 points)

There are $6^4 = 1,296$ possible outcomes when rolling four dice. Count how many of these outcomes are of the following types:

(a) No pairs?

(b) Exactly one pair?

(c) Exactly two pairs?
Problem 5 (25 points)

How many ways can three women and three men be seated on six chairs?

(a) Charis in a row with no seating restrictions?

(b) If women and men must alternate with the chairs in a row?

(c) If the chairs are now arranged in a circle under the restriction that no two women can sit next to each other?
Problem 6 (10 points)

Ten people attend a potluck dinner. Each of the ten people are assigned what to bring as a dish by category.
- 5 people are to bring a main dish
- 3 people are to bring drinks
- 2 people are to bring a dessert

How many ways can ten people be assigned what dish to bring?

Problem 7 (10 points)

Numerically evaluate the two binomial coefficients:

(a) \[ \binom{12}{8} \]

(b) \[ \binom{18}{2} \]