

Math 131 (Term 163)

Exam 2 (Duration: 90 minutes)

Student Name _____ Student ID: _____

Question	Score
1	\10
2	\10
3	\10
4	\10
5	\10
6	\10
7	\10
8	\10
9	\20
Total Score	\100

Exercise 1 (10 points)

An investor has two choices of investing a sum of money; Choice 1: 8% compounded annually or Choice 2: 7.8% compounded semiannually. Which is the better of the two choices?

Exercise 2 (10 points)

A debt of 5000 SR due five years from now and 5000 SR due ten years from now is to be repaid by a payment of 2000 SR in two years, a payment of 4000 SR in four years, and a final payment at the end of six years. If the interest rate is 2.5% compounded annually, how much is the final payment?

Exercise 3 (10 points)

If interest is compounded continuously at an annual rate of 7%, how many years would it take for a principal to triple?

Exercise 4 (10 points)

In order to replace a machine in the future, a company is placing equal payments into a sinking fund at the end of each year so that after 10 years the amount in the fund is 25,000 SR. The fund earns 6% compounded annually.

(a) Find the annual payment.

(b) Find the value of the fund after 6 years.

(c) After 6 years, the interest rate increases and the fund pays 7% compounded annually. Because of the higher interest rate, the company decreases the amount of the remaining payments. Find the amount of the new payment.

Exercise 5 (10 points)

A scientist won a 4,000,000 SR prize and will receive a check for 200,000 SR now and a similar one at the beginning of each year for the next 19 years. To provide these payments, the prize Commission purchased an annuity at the interest rate of 8% compounded annually. How much did the annuity cost the Commission?

Exercise 6 (10 points)

In how many ways can a basketball coach assign positions to five-member team if two of the members are qualified for the center position and all five are qualified for all the other positions?

Exercise 7 (10 points)

A coin is tossed 6 times and the resulting sequence of Heads and Tails is recorded. How many sequences have at most 3 Tails?

Exercise 8 (10 points)

On an eight-question, multiple-choice examination, there are five choices for each question, only one of which is correct. If a student answers each question in a random fashion, find the probability that the student answers exactly four questions correctly.

Exercise 9 (20 points)

Urn I contains 2 Red and 2 Blue marbles. Urn II contains 1 Pink and 1 Blue marbles. An urn is selected at random. Then a marble is randomly drawn from it and placed in the other urn, from which we randomly draw a marble.

(a) Set the tree diagram with the corresponding probabilities .

(b) Let **E** denote the event that the second draw yields a Pink marble. Find $P(\mathbf{E})$.

(c) Let **F** denote the event that the first draw yields a Pink marble. Are **E** and **F** independent?