Your Name:

Test 3

100 Points (Time: 90:00 Minutes + 10 Minutes if needed)

Instruction for all problems: Show your work. No round down or up, use 2 decimals for dollar values and 4 decimals for factors.

Question 1: (30 points)

The data below show two patterns of inflation that are exactly the opposite of each other over a 20-year time period.

(a) If each machine costs \$10,000 in year 0 and they both increase in cost exactly in accordance with the inflation rate, how much will each machine cost at the end of year 20?

(b) What is the average inflation rate over the time period for machine A (that is, what single inflation rate would result in the same final cost for machine A)?

(c) In which years will machine A cost more than machine B?

Year	Machine A, %	Machine B, %
1	10	2
2	10	2
3	2	10
4	2	10
5	10	2
6	10	2
7	2	10
8	2	10
•		
•	•	•
•		
10	2	10
17	2	10
20	2	10

Solution:

Your Name:

Question 2: (20 points) Select one of the options and solve

<u>OPTION 1</u>: Exactly 10 years ago, Boyditch Professional Associates purchased \$100,000 in depreciable assets with an estimated salvage of \$10,000. For tax depreciation, the SL method with n = 10 years was used, but for book depreciation, Boyditch applied the DDB method with n = 7 years and neglected the salvage estimate. The company sold the assets today for \$12,500.

(a) Compare the sales price today with the book values using the SL and DDB methods.

(b) If the salvage of \$12,500 had been estimated exactly 10 years ago, determine the depreciation for each method in year 10.

OPTION 2: An investor who purchased a \$10,000 mortgage bond today paid only \$6000 for it. The bond coupon rate is 8% per year, payable quarterly, and the maturity date is 18 years from the year of issuance. Because the bond is in default, it will pay no dividend for the next 2 years. If the bond dividend is in fact paid for the following 5 years (after the 2 years) and the investor then sells the bond for \$7000, what rate of return will be realized (a) per quarter and (b) per year (nominal)?

Your Name:

Question 3: (30 points)

On a student loan, you have received \$10,000 twice a year on January 1st and August 1st of each year for the last 9 semesters. Rate is 8% compounded monthly. Upon graduation, you start paying back your loan. What should your monthly payments be to pay back your loan in the same amount of months it took you to graduate? You began your education in Fall semester and graduated in December.

Your Name:

Question 4: (20 points)

Develop a relationship between the values of the gradients for geometric and arithmetic gradient series for the project to have 16% rate of return (annual compounding).

