Test 2

100 Points

Time: 100 Minutes (+ 10 if you had roll-over minutes)

Read instructions carefully. Explain and show your work. No use of computer or cell phone allowed. Use of printed formula sheet and table for 8%, 12% and 15% is allowed. Non-digital textbook for use of the 3 tables (not the formula) is allowed. Write your name on sheets of paper you have (including table and formula sheets) and turn them in at the end of the test time.

Use of EXCEL: There are 2 computers assigned to be used with EXCEL for rate of return calculation only. Any Internet access attempt or use of EXCEL for problems not eligible for spreadsheet use would cause in immediate disqualification and a grade of zero on overall test. Use of the computer is limited to 5 minutes per person at a time. No file should be saved, only the results copied. EXCEL should be closed after the use and launched by the next user. You must have the cash flow that you are planning to enter ready and show it to the instructor before you are allowed to use the spreadsheet.

PROBLEM 1:
Determine which of the following two machines will have the lower (a) capital recovery and (b) equivalent annual total cost.
Machine A has a first cost of $80,000 and an operating cost of $21,000 in year 1, increasing by $500 per year through year 5, after which time it will have a salvage value of $13,000. Machine 2 has a first cost of $62,000 and an operating cost of $21,000 in year 1, increasing by 8% per year through year 5, after which time it will have a scavenge value of $2000. Utilize an interest rate of 12% per year compounded monthly to determine both estimates. (25 pts) (No use of EXCEL)

PROBLEM 2:
Five years ago, Nagrom Etats issued $20 million worth of 12% 30-year bonds with the dividend payable by-monthly. The bonds have a call date of this year if Nagrom Etats decides to take advantage of it. The interest rate in the marketplace decreased enough that the company is considering calling the bonds since the coupon rate is relatively high. If the company buys the bonds back now for $21.5 million, determine the rate of return that the company will make (a) per quarter and (b) per year (nominal). (20 pts) (EXCEL eligible)

PROBLEM 3:
Use the modified rate of return approach with an investment rate of 15% per year and a borrowing rate of 8% to find the external rate of return for the following cash flows.

Year	0	1	2	3
Net Cash Flow ($)	+16,000	-32,000	-25,000	+70,000.

(25 pts) (No use of EXCEL)

PROBLEM 4:
Five revenue projects are under consideration by General Dynamics for improving material flow through an assembly line. The initial cost in $1000 and the life of each project are as follows (revenue estimates are not shown):

	PROJECT				
	A	B	C	D	E
Initial Cost ($1000)	-700	-2300	-900	-300	-1600
Life (Years)	5	8	5	5	6

An engineer made the comparisons shown below. From the calculations, determine which project, if any, should be undertaken if the company's MARR is (a) 11.5% per year and (b) 13.5% per year. If other calculations are necessary to make a decision, state which ones. (30 pts) (EXCEL eligible)

Comparison	Incremental Rate of Return, %
B vs DN	13%
A vs B	19%
D vs DN	11%
E vs B	15%
E vs D	24%
E vs A	21%
C vs DN	7%
C vs A	19%
E vs DN	12%
A vs DN	10%
E vs C	33%
D vs C	33%
D vs B	29%