

# CTC/MTC 374 Test Review: Midterm 1 (Lectures 1-7); Midterm 2 (Lectures 7-13); Final (Lectures 14-21)

## 1. Single Sums (equation and/or factor form)

Find F given P (move single cash flow to the future)

Find P given F (move single cash flow back in time)

Find the interest rate (i) or time period (n)

## 2. Cash Flow Patterns (Shortcuts of multiple cash flows that show a pattern)

a. Uniform Series (where A is a uniform cash flow of n periods)

P/A (P occurs 1 time period before first A; n=number of cash flows)

F/A (F occurs at the same time as the last A; n=number of cash flows)

A/P (Find a uniform series given a single sum one year before the first cash flow A)

A/F (Find a uniform series given a single sum at the end of the last cash flow A)

b. Gradient Series (cash flows differ by a constant amount)

c. Geometric Series (cash flows differ by a constant percentage)

## 3. Rates (all three must match: 5% per year compounded yearly; time period-years)

a) Sometimes you can just change time period (usually P/F or F/P)

b) Change interest rate to match the cash flow period (any type of series)

c) Determining interest and principal (equity)

d) Continuous Compounding ( $i_{\text{eff}} = e^r - 1$ )

## 4. Methods for Determining Economic Feasibility (MARR is minimum attractive rate-of-return)

a. Present Worth (PW)-Move all cash flows to period 0;  $PW > 0$

b. Future Worth (FW)-Move all cash flows to the future;  $FW > 0$

c. Annual Worth (AW)-Find A/P or find A/F;  $AW > 0$

d. IRR-Set  $PW/AW$  or  $FW=0$  and solve for IRR;  $IRR > MARR$

e. ERR-Set FW of negative Cash Flow(s) @ ERR equal to FW of positive cash flows @ MARR (or e that is different than MARR);  $ERR > MARR$

f. SIR or B/C-PW of positive cash flows/PW of negative cash flows ( $B/C > 1$ )

g. PBP (non-discounted or discounted)-how many time periods until you get your investment back (not equivalent to a-f)

h. Capitalized Worth (often  $AW/MARR$  but not necessarily equivalent to a-f)

## 5. Bonds (covered but not tested)

## 6. Comparing alternatives

a. Ranking (works for PW, AW, FW)

b. Incremental (must use for IRR, ERR or B/C)

## 7. Replacement Problems (defender vs challenger; outside viewpoint)

## 8. Cost Estimating/Accounting/Breakeven-Present Economy

- a. Cost Estimating (Indices: time, place, size) Units (per sq ft), Factor (complete breakdown)
- b. Balance Sheet; Income Sheet
- c. Present Economy (determine which machine should be used)
- d. Linear/Nonlinear Breakeven (equations for costs, revenue and net profit)

#### 9. Depreciation

- a. Methods (SL, DB, SOYD, MACRS)
- b. Book value; Depreciation

#### 10. Convert Before-Tax Cash Flow (BTCF) to After-Tax Cash Flow (ATCF)

#### 11. Methods to help evaluate Uncertainty

- a. Breakeven
- b. OMP (optimistic, most probably, pessimistic)
- c. Spider-Graph (evaluate range of values)
- d. Monte-Carlo simulations (define probabilities, make many runs)