

1. Compute the effective annual interest rate in each of these situations: (15%)
 - 1.1. 10% nominal interest, compounded semiannually.
 - 1.2. 10% nominal interest, compounded quarterly.
 - 1.3. 10% nominal interest, compounded weekly.

2. A company has issued 10-year bonds, with a face value of \$1,000,000, in \$1000 units. Interest at 8% (per year) is paid quarterly.
 - 2.1. If an investor desires to earn 12% nominal interest (compounded quarterly) on \$10,000 worth of these bonds, what would the purchase price have to be? (10%)
 - 2.2. If the company plans to redeem these bonds in total at the end of 10 years and establishes a fund that earns 8%, compounded semiannually, for this purpose, what is the annual cost of interest and redemption? (10%)

3. In the design of a special-use structure, two mutually exclusively alternatives are under consideration. These design alternatives are as follows:

	D ₁	D ₂
Capital investment	\$50,000	\$120,000
Annual expenses	\$9,000	\$5,000
Useful life (years)	20	50
Market value (at end of useful life)	\$10,000	\$20,000

- If perpetual (永久的) service from the structure is assumed, which design alternative do you recommend? The MARR (Minimum Attractive Rate of Return) is 10% per year. (20%)
4. Your company has purchased equipment (for \$50,000) that will reduce materials and labor costs by \$14,000 each year for N years. After N years, there will be no further need for the machine, and because the machine is specially designed, it will have no MV at any time. However, you can depreciate the equipment on an SL (Straight Line) basis with a tax life of five years. If the effective income-tax rate is 40%, what is the minimum number of years your firm must operate the equipment to earn 10% per year after taxes on its investment? (20%)

 5. The capital investment for a new highway paving machine is \$838,000. The estimated annual expense, in year zero dollars, is \$92,600. This expense is estimated to increase at the rate of 6.3% per year. Assume that f (inflation rate) = 4.5%, $N = 7$ years, MV at the end of year seven is 15% of the capital investment, and the MARR (inflation-free) is 10.05% per year. What uniform annual revenue would the machine need to generate to break even? (25%)

(背面仍有題目,請繼續作答)

To Find:	Given:	Factor by Which to Multiply "Given"	Factor Name	Factor Functional Symbol
<i>For single cash flows:</i>				
F	P	$(1+i)^N$	Single payment compound amount	(F/P, i%, N)
P	F	$\frac{1}{(1+i)^N}$	Single payment present worth	(P/F, i%, N)
<i>For uniform series(annuities):</i>				
F	A	$\frac{(1+i)^N - 1}{i}$	Uniform series compound amount	(F/A, i%, N)
P	A	$\frac{(1+i)^N - 1}{i(1+i)^N}$	Uniform series present worth	(P/A, i%, N)
A	F	$\frac{i}{(1+i)^N - 1}$	Sinking fund	(A/F, i%, N)
A	P	$\frac{i(1+i)^N}{(1+i)^N - 1}$	Capital recovery	(A/P, i%, N)

$$F = \frac{G}{i}(F/A, i\%, N) - \frac{NG}{i}$$

$$P = \frac{A_1}{1+f}(P/A, i_{CR}\%, N)$$

$$i_{CR} = (1+i)/(1+f) - 1$$