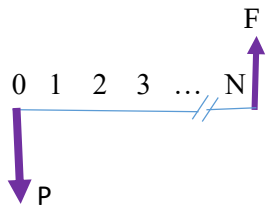
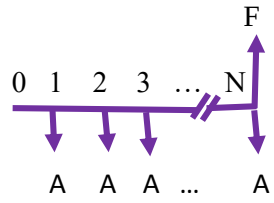
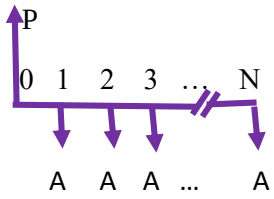
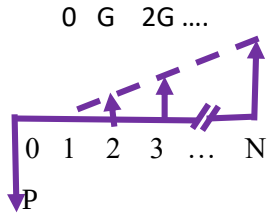
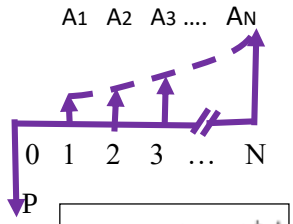
ISE307 Engineering Economic Analysis Formula Sheet

Factor Notation	Formula	Cash Flow Diagram
$F = P\ (F/P,i,N)$	$F = P(1+i)^N$	
$P = F\ (P/F,i,N)$	$P = F(1+i)^{-N}$	
$F = A(F/A,i,N)$	$F = A\left[\dfrac{(1+i)^N - 1}{i}\right]$	
$A = F\ (A/F,i,N)$	$A = F\left[\dfrac{i}{(1+i)^N - 1}\right]$	
$P = A\ (P/A,i,N)$	$P = A\left[\dfrac{(1+i)^N - 1}{i(1+i)^N}\right]$	
$A = P(A/P,i,N)$	$A = P\left[\dfrac{i(1+i)^N}{(1+i)^N - 1}\right]$	
$P = G(P/G,i,N)$	$P = G\left[\dfrac{(1+i)^N - iN - 1}{i^2(1+i)^N}\right]$	
$A = G(A/G,i,N)$	$A = G\left[\dfrac{(1+i)^N - iN - 1}{i\left((1+i)^N - 1\right)}\right]$	
$P = A_1(P/A_1,g,i,N)$	$P = \begin{cases} A_1\left[\dfrac{1-(1+g)^N(1+i)^{-N}}{i-g}\right] & i \neq g \\ \dfrac{A_1 N}{1+i} & i = g \end{cases}$	 $A_k = A_1(1+g)^{k-1}$

Discrete Compounding:

$$i = \left(1 + \frac{r}{KC}\right)^C - 1$$

Special case:

$$i_a = \left(1 + \frac{r}{M}\right)^M - 1$$

Continuous Compounding

$$i = e^{r/K} - 1$$

$$i = i' + \bar{f} + \bar{f}\, i'$$

$$\bar{f} = \frac{i - i'}{1 + i'}$$

$$CPI_n = CPI_0(1 + \bar{f})^n$$

$$\bar{f} = \left(\frac{CPI_n}{CPI_0}\right)^{(1/n)} - 1$$

$$CR = I(A/P,i,N) - S(A/F,i,N)$$
$$= (I - S)(A/P,i,N) + i\ S$$