TIME VALUE OF MONEY

FUTURE VALUE

1. FV of a single sum of money $\Rightarrow FV = PV(1+i)^n$.
   $\Rightarrow FV = PV \times FVIF_{(i,n)}$

2. FV of a single sum of money after n years when compounding is done m times a year.
$$FV = PV\left(1+\frac{i}{m}\right)^{m \times n}$$

3. Effective Rate of Interest vs. Nominal Rate of Interest
$$r = \left(1+\frac{i}{m}\right)^{m} - 1$$
where r = effective rate of interest
i = Nominal rate of interest
m = Frequency of compounding in a year.

4. Doubling Period
   (i) Rule of 72 $\Rightarrow$ $D/P = \dfrac{72}{\text{Rate of Interest}}$
   (ii) Rule of 69 $\Rightarrow$ $D/P = 0.35 + \dfrac{69}{\text{Rate of Interest}}$

5. FV of Annuity (Regular) $\Rightarrow FVA = A \times \left[\dfrac{(1+i)^n - 1}{i}\right] = A \times FVIFA_{(i,n)}$

6. FV of Annuity (Due) $\Rightarrow FVA = A(1+i) \times FVIFA_{(i,n)}$

PRESENT VALUE

1. PV of a single sum of money $\Rightarrow PV = \dfrac{FV}{(1+i)^n} = FV \times \left[\dfrac{1}{(1+i)^n}\right]$
   $\Rightarrow PV = FV \times PVIF_{(i,n)}$

2. PV of annuity (Regular) $\Rightarrow PVA = A \times \left[\dfrac{(1+i)^n - 1}{i(1+i)^n}\right] = A \times PVIFA_{(i,n)}$

3. PV of annuity (Due) $\Rightarrow PVA = A(1+i) \times PVIFA_{(i,n)}$

4. PV of Perpetuity $= \dfrac{A}{i} = \dfrac{\text{Annual Payment amount}}{\text{Rate of Interest in decimal}}$