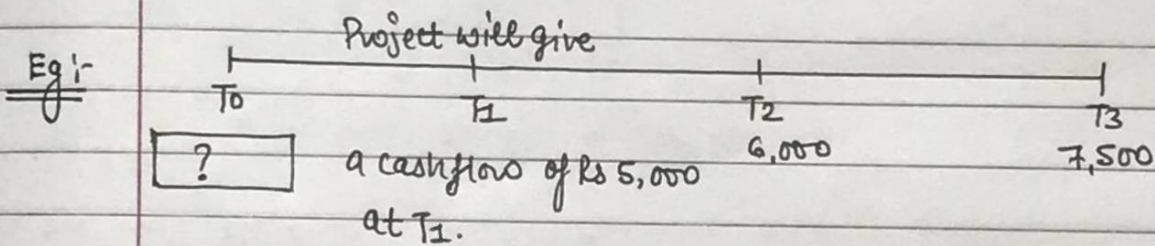


$$FV = PV (1+r)^n$$

$$T_1 = 1,00,000 (1 + 0.01)^{12} = 1,12,682$$

$$\text{Rate} = 12\% \text{ pa} = \frac{12\%}{12} = 1\% \text{ (monthly)}$$

* Annuity - series of cashflows of equal amounts at equal time intervals.



Calculate the PV? ROY = 6%

$$= \frac{5,000}{1.06} = 4,716$$

$$= \frac{6,000}{1.06} = 5,339 \quad \text{①} = 16,354 \rightarrow \text{①}$$

$$= \frac{7,500}{1.06} = 6,297$$

* Present Value of Annuity -

$$\text{Annuity} \times PVAF (r, n)$$

where, PVAF = Present Value Annuity Factor.

r = Rate of interest for period of compounding.

n = no. of times compounded.

Eg:-

Annuity = Rs 10,000.

Compounded = semi-Annually.

ROY = 12% pa

No. of years = 3 years

calculate PV of Annuity.

$$= 10,000 \times \left[\frac{1}{(1.06)^6} \right] = 10,000 \times 4.917324 = 49,173.$$

Eg:

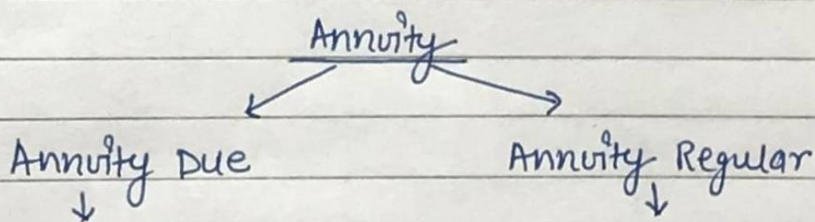
Annuity = Rs 8,000
 Compounded = Quarterly
 ROG = 10% pa = 2.5%
 No. of years = 2 years $\times 4 = 8$
 $= 8,000 \times \left[\frac{1}{(1.025)^8} \right]$
 $= 8,000 \times 7.170137 = 57,361.$

* Future Value of Annuity -

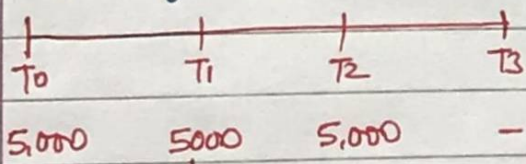
$$FV = PV(1+r)^n$$

$$PV = \frac{FV}{(1+r)^n}$$

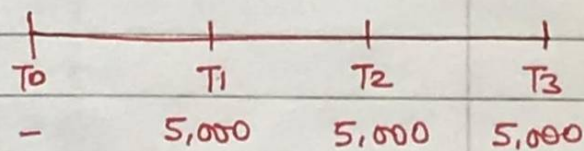
$$PV \text{ of Annuity} = A \times PVAF(r, n)$$



when annuity starts from beginning of period.



when annuity starts from the end of the period.



$$\text{Future value of Annuity} = \frac{A}{i} [(1+i)^n - 1]$$

A = Annuity.

i = Rate of Interest for period of compounding.

n = no. of times compounded.

Eg:-

Calculate the Future value of Annuity.

Annuity = Rs 5,000

ROD = 12% p.a

Tenure = 3 years

$$FV = \frac{A}{i} \times [(1+i)^n - 1]$$

$$= \frac{5,000}{0.12} \times [(1+0.12)^3 - 1] = \frac{5,000}{0.12} \times [(0.404928)]$$

$$= 16,872$$

* Concept of Dirty Power -

Eg:- $FV = PV(1+r)^n \rightarrow 4.5 \text{ years}$

$$\Rightarrow 10,000(1.12)^{4.5 \rightarrow 9/2} \Rightarrow 16,652$$

steps to calculate Dirty Power -step 1 $\rightarrow \sqrt{\quad}$ 12 timesstep 2 $\rightarrow -1$ step 3 $\rightarrow \times$ by dirty powerstep 4 $\rightarrow +1$ step 5 $\rightarrow \times$ 12 timesEg:-

Case	Annuity	ROD	Compounded	n	FV
1	10,000	8%	Annually	4	45,061
2	8,000	6% (3%)	semiannually	3 x 2 = 6	51,747
3	5,000	10% (2.5%)	Quarterly	2 x 4 = 8	43,680
4	15,000	12% (6%)	semiannually	2 x 2 = 4	65,619

* Present value of Perpetuity -

LC zindagi ke sath bhi, zindagi ke baad bhi.

NO Growth

$$PV \text{ of perpetuity} = \frac{A}{i/r}$$

Constant Growth

$$PV \text{ of perpetuity} = \frac{A}{i-g}$$

A = Annuity

r/i = Rate of interest for the period of compounding.

g = growth rate.

Compounded Annual Growth Rate (CAGR) -

$$CAGR \Rightarrow r_c = \left[\frac{FV}{PV} \right]^{1/n} - 1$$

Eg:- Revenue of a company for the year 2020 = 1000 Cr \rightarrow FV
 Revenue of a company for the year 2010 = 100 Cr \rightarrow PV
 $\therefore n = 10$ years

$$FV = PV (1+r_c)^n$$

$$\frac{1000}{100} = (1+r_c)^{10} \Rightarrow \left(\frac{1000}{100} \right)^{1/10} = 1+r_c$$

$$r_c = \left(\frac{1000}{100} \right)^{1/10} - 1 \therefore r_c = \underline{\underline{25.89\%}}$$

\rightarrow cash by dirty Power.