Chapter 2 Assignment

Q. No. 1 ⇒

Interest rate (R) = 8%.

Compounded annually.

Amount (F) = 5000

Time (T) = 5 years

Now,

$P = 5000(P/F, 0.08, 5)$.

Now,

$$P = \frac{5000}{(1+0.08)^5}$$

$= 3402.91$.

∴ Rs 3402.91 can be Repaid.

Again

$F = 12{,}000(F/P, 0.08, 4)$.

$= 12{,}000(1+0.08)^4$

$= 16325.867$

Ans //

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Q. No. 2 =>
Soln:
Rate (i) = 15 %.
$P = P$
$F = 2P$
Time (T) = ?.
we know
$2P = P(F/P, 0.15\%, T)$.

$2P = P(1+0.15)^T$

$2 = (1+0.15)^T$

Taking log on both side

$\log_e(2) = T(\log_e(1.15))$

$T = 4.95 \approx 5$ years.

∴ for five years time, the stock of share should be on hold

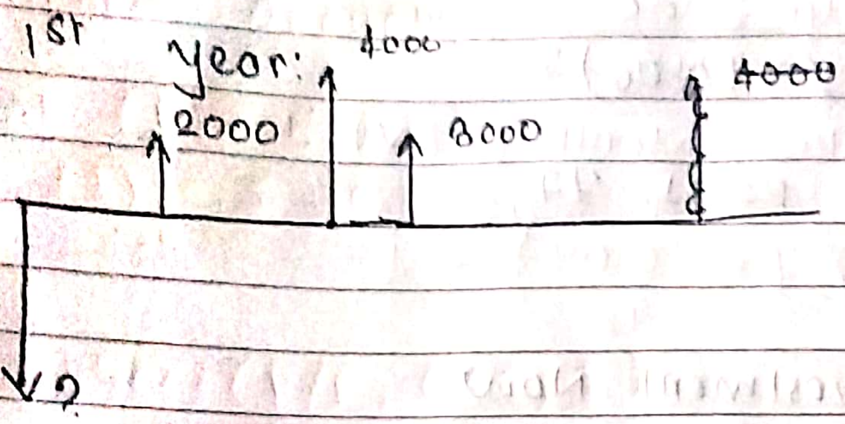
Q. No. 3 =>

Soln:

Principle (P) = ?

Rate (i) = 6%.

For 1st year:



We know:

$P = 2000\,(P/F,\ 0.06\%,\ 1).$

$$P = \frac{2000}{(1+0.06)}$$

$P = \cancel{285.714}.$ ~~(1st year)~~ 1886.792 is

For 3rd year:

$P = 4000\,(P/F,\ 0.06,\ 3)$

$$= \frac{4000}{(1+0.06)^3}$$

$= 3358.477.$

for 5^{th} year.

$P_3 = 3000\,(P_S/F_S,\ 0.06,\ 5)$.

$= \dfrac{3000}{(1+0.06)^5}$

$= 2241.77$.

Now.
Total investment Now
$P_{total} = P_1 + P_2 + P_3$
$= 1886.792 + 3358.477 + 2241.77$
$= 7487.04$ Ans //

S. No. ~~4~~ // 6.
soln:
a). Rs 2455 in 10 years at 6%.
compounded semi annually.

~~i_{eff} =~~ Given.
$P = 2455$
$T = 10$ years
rate $(i) = 6\%$.
compounded semi annually $(M) = 2$.

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$i_{eff} = \left(1 + r/m\right)^m - 1$

$= \left(1 + \frac{0.06}{2}\right)^2 - 1$

$= 0.0609$

Now

$F = 2455\,(F/P,\ 0.0609,\ 10)$

$= 2455\,(1 + 0.0609)^{10}$

$= 4434.$

$\therefore$ Rs 4434 will be the amount

) Rs 5500 in 15 years at 8% compounded quarterly.

here

$P = 5500$

$n = 15$ yrs

$r = 8\%$

compounded quarterly means in 1 year 4 times

Thus $T = 15 \times 4 = 60.$, $r = 8\% / 4 = 2\%$ per quart

Rs $F = 5500\,(F/P,\ 0.8,\ 60)$

$= 5500\,(1 + 0.02)^{60} = 18045.66934$ Ans.

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c). Rs 21000 in 7 years at 9% compounded monthly.

$P = 21000$
$T = 7$ yrs
$R = 9\%$.
compounded Monthly $(M) = 12$.

$$i_{eff} = \left(1 + \frac{0.09}{12}\right)^{12} - 1$$

$$= 0.0938$$

Now
$F = 21000\ (F/P,\ 0.0938,\ 7)$.

$F = 21000 \times (1 + 0.0938)^{7}$

$= 39335.50$ Rs.

∴ Rs 39335 will be compounded

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Q. No. 8 ⇒
Soln:
Intrest (I) = 6%
amaint (F) = 20,000
Time (T) = 8 years

a) Compounded Annually.

$P = Rs.\ 20000\ (P/F,\ 0.06,\ 8)$

$= \dfrac{20000}{(1+0.06)^8}$

$= 12548.25.$

∴ RS 12548.25 should be invested

b) Compounded Semiannually.
$M = 2.$
Now,
$i_{eff} = 6\% / 2 = 3\%$ per annual
Time (T) = 8 × 2 = 16 years,

$P = 20000\ (P/F,\ 0.03,\ 16)$

$= \dfrac{20000}{(1+0.03)^{16}}$

= 12463.354 should be invested

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c) compounded monthly.

$M = 12$

$$i_{eff} = \left(1 + \frac{0.06}{12}\right)^{12} - 1$$

$$= 0.0617.$$

$$P = 20{,}000\,(P/F,\ 0.0617,\ 8)$$

$$= \frac{20{,}000}{(1+0.0617)^8}$$

$$= \cancel{12388.4}\quad 12390.48 \text{ Ans.}$$

$\therefore$ Rs 12390.48 should be compounded

d) Compounded weekly.

$M = 52$

compounded weekly $(r) = 8 \times 52 = 416.$

Rate $(i) = 0.06/52 = 1.154 \times 10^{-3}$

$$P = 20{,}000\,(P/F,\ 1.154\times10^{-3},\ 416)$$

$$= \frac{20{,}000}{(1+1.154\times10^{-3})^{416}}$$

$$= 12379.83$$

$\therefore$ Rs 12379.33 should be compounded.

Q. No. 9 ⇒

~~Prin~~ Principle (P) = Rs 1,000

Intrest Rate (8%) = r = 8%.

Compounded quarterly (M) = 4.

Now

$$i_{eff} = \left(1 + 0.08/4\right)^4 - 1$$

$$= 0.0824$$

$$F = 1000\,(F/P,\ 0.0824,\ 10)$$

$$= 10000\,(1 + 0.0824)^{10}$$

$$= \cancel{40}\ 2208.039.$$

∴ Rs 2208.039 would be equivalent.

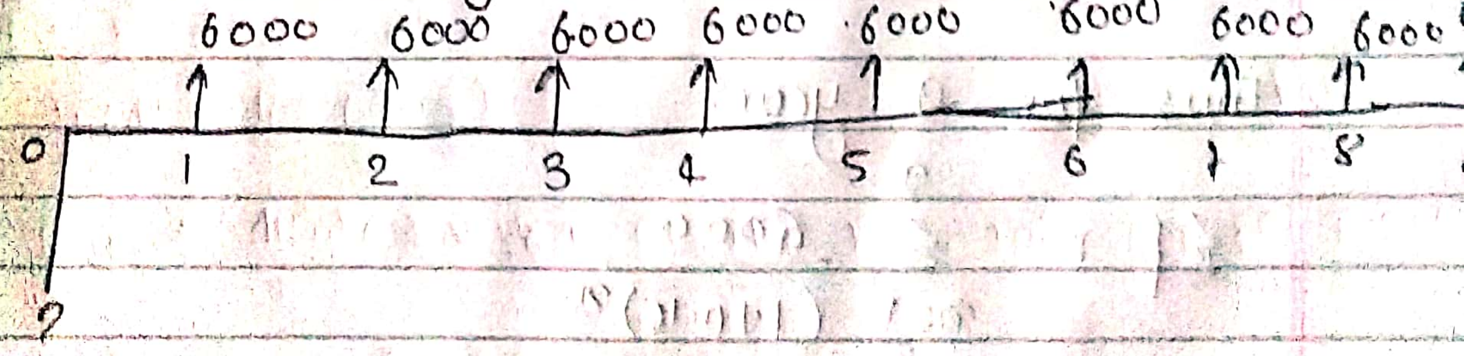
Q. No. 10 ⇒

Solution:

Time (T) = 9 years.

Rate (R) = 16%.

Rs 6000 per year (i).



Sol

Amount (F) = 6000 yg.

P = ?

R = 16%.

T = 9 years

Now:

$P = 540000 \cancel{(P/F, 0.16, 9)}$

$\cancel{= \frac{54000}{(1+0.16)^9}}$

=

$I = \frac{PTR}{100}$

$= \frac{100 \times 6000}{16}$

$\frac{6000}{(1+0.16)}$

Thus:

$P_1 = \frac{6000}{(1+0.16)^9}$

$P_2 = \frac{6000}{(1+0.16)^8}$.

Thus for 9 years

$\Sigma P = \sum_{x=1}^{9} \frac{6000}{(1+0.16)^x}$

$= 27639.26325$

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Q. NO. 4 ⇒

What is annual series of Payment must be paid into a sinking fund to Accumulate following amount?

Rs 10,000 in 13 years at 5% compounded Annually.

Soln:

F = Rs 10000

Time (N) = 13 yrs

Rate (I) = 5% compounded annual

Annual Series of payment (A) = ?

$$\boxed{A = F \times \left\{ \frac{i}{(i+1)^n - 1} \right\}}$$

We know.

$$A = F\,(A/F,\ 5\%,\ 13).$$

Thus,

$$A = 10{,}000 \left\{ \frac{0.05}{(1+0.05)^{13} - 1} \right\}$$

$$= \text{Rs } 564.56.$$

The annual series of payment is Rs 564.56.

b) Rs 25000 in 10 years compounded Annually.
we know
functionally

$$A = 25000\,(A/F,\ 0.09,\ 10).$$

Thus,

$$A = 25000 \times \left\{ \frac{i}{(1+i)^N - 1} \right\}$$

$$= 25000 \times \left\{ \frac{0.09}{(1+0.09)^{10} - 1} \right\}$$

$$= \text{Rs } 1645.50.$$

∴ The annual deposit is Rs 1645.50,,

c) Rs 15,000 in 25 years at 7% compounded annually.
Functionally,

$$A = 150000\,(A/F,\ 0.07,\ 25)$$

So,

$$A = 15000 \times \frac{0.07}{(1+0.07)^n - 1}$$

$$= 237.16 \text{ Rs.}$$

∴ The Annual deposit is Rs 237.16.

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d) Rs 8,000 in 8 years at 12% compounded Annually.

Soln:

$A = 8000 \times (A/F, 0.12, 8)$

Using formula,

$$A = \frac{8000 \times 0.12}{(1+0.12)^8 - 1}$$

$$= Rs\ 650.42.$$

The Annual deposit is Rs 650.42

Q.No.5 ⇒.

Part of income that machine generates is put into a sinking fund to replace the machine when it wears out. If Rs 1,500 is deposited Annually at 7% intrest, how many years must the machine is kept before a New machine costing Rs 25,000 can be purchased.

Soln:

Annual deposit (A) = Rs 1500.

Intrest Rate (I) = 7%

~~Final~~ Future Amount (F) = Rs 25,000.

Time (N) = ?

Using sinking fund method

$A = F(A/F, 0.07, N).$

P.T.O

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$$1500 = 25000 \times \left\{ \frac{0.07}{(1+0.07)^N - 1} \right\}$$

$$\frac{1500}{25000 \times 0.07} = \frac{1}{(1+0.07)^N - 1.}$$

$$\frac{1}{0.8572} = \frac{1}{(1+0.07)^N - 1.}$$

$$(1+0.07)^N = 1 + 0.8\cancel{7}572.$$

Taking log on both sides.

$$N \ln(1.07) = \cancel{\ln(1.8752)} \quad \ln(1.8572)$$

$$\therefore N = \cancel{\frac{\ln(1.8752)}{\ln(1.07)}}. \quad \frac{\ln(1.8572)}{\ln(1.07)}$$

$$= 9.15 \text{ years.}$$

$\therefore$ Required Time is 9.15 years.

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Q. No. 10 =)

How much money will you be willing to pay now for guranteed 6000 per year for 9 years starting next year at a Return Rate of 16% per year.

Solution.

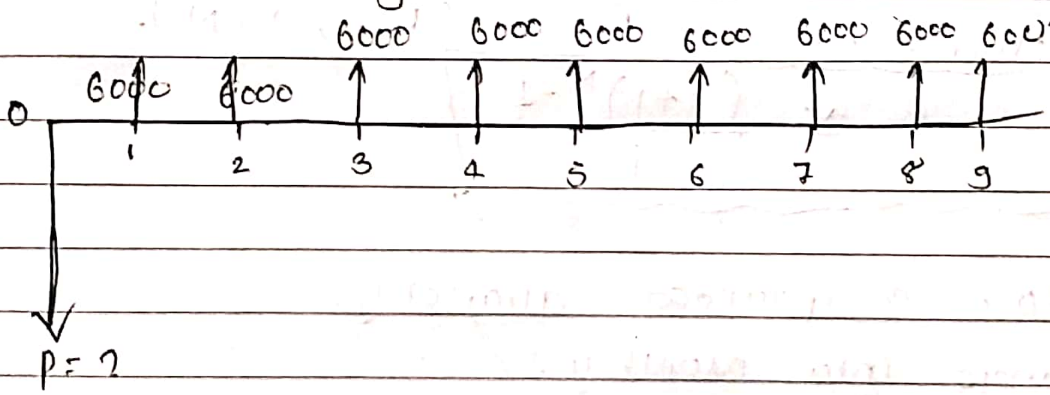
Amount Paid (A) = RS 6000 / year.

Time (N) = 9 years.

intrest Rate (I) = 16% / year.

Present Amount (P) = ?

Cash flow diagram.



Thus.

$$\boxed{P = \frac{A\left[(1+i)^N - 1\right]}{\left[i \times (1+i)^N\right]}}$$

$$P = A\,(P/A,\ 0.16,\ 9).$$

$$= \frac{6000 \times \left[(1+0.16)^9 - 1\right]}{\left[0.16 \times (1+0.16)^9\right]}$$

= RS 27639.263 Required Ans.

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Q. No. 11 =)

Suppose you make $ 500 monthly deposits to a tax deffered retirement plan that pays intrest rate of 10% compounded quarterly. Compute balance at end of 10 years

Solution.

Amount deposited (A) = $ 500 monthly.
Time (N) = 10 years
Intrest Rate (I) = 10% compounded quarterly.
Future Amount (F) = ?

we know.

functionally: $F = A\,(F/A, i, N)$.

$$\boxed{F = A \times \frac{(i+1)^{N}-1}{i}}$$

I = 10% compounded quarterly.
To change into monthly.
$M = \cancel{4}\,3$

Now

$$i_{eff\ monthly} = (1+0.10)^{1/\cancel{4}3} - 1 = 0.0322 \text{ per month}$$

$$= (\cancel{1+0.10})^{\cancel{0.25}} - 1 = 3.22\% \text{ per month.}$$

$$= \cancel{0.0241 \text{ per month}}.$$

Now:
$i = 0.0322$
$N = 10 \times 3$ years.

~~using ieff in given formula we get.~~

$$\cancel{f = \frac{500 \times \left[(1+0.0322)^{10\times 1} - 1\right]}{0.0322}}$$

Given,

$i = 10\%$ compounded quarterly.

$i = 10\%/4 = 2.5\%$ per quarter.

$$i_{monthly} = (1+0.025)^{1/3} - 1$$
$$= 8.26 \times 10^{-3}$$
$$= 0.00826$$
$$= 0.826\% \text{ per month.}$$

[0.0252]
400

Now, Time (N) = $10 \times 12 = 120$ months.

using formula we get.

$$f = \frac{500 \times \left[(1+0.00826)^{120} - 1\right]}{0.00826}$$

$$= 101907.89.\ \$.$$

$\therefore$ The balance at end of 10 years is \$ 101907.89,

K Imp

in this case,

$$i_{eff} = \left(1 + \frac{0.10}{4}\right)^{4} - 1 = 0.1038.$$

$$i_m = (1+0.1038)^{1/12} = 0.826\% \text{ per month}$$

(Another way//)//

Q. No. 7

find Present worth of Rs 10,000 per year for 6 years if intrest Rate is compounded continuously? $i = 10\%$.

Soln!

Given.

Amount per year (A) = Rs 10,000.

Time (N) = 6 years

Intrest rate (I) = 10%.

Present worth (P) = ?

weknow

$P = A\,(P/A,\ i\%,\ N)$.

Thus.

for continuous compounding.

$$P = 10000 \times \frac{e^{0.10\times 6} - 1}{e^{0.10\times 6}\,(e^{0.10} - 1)}.$$

= Rs 42900. 48

Formulas.

$F = P \times e^{iN}$.

$P = F \times e^{-iN}$

$F = A \times \frac{e^{iN} - 1}{e^{i} - 1}$

$P = A \times \frac{e^{iN} - 1}{e^{iN}.(e^{i} - 1)}$

$A = F \times \frac{e^{i} - 1}{e^{iN} - 1}$

$A = \frac{P \times e^{iN}\,(e^{i} - 1)}{(e^{iN} - 1)}$.

∴ Required present worth is Rs 42900.48 //

Q.No.12 ⇒.

ABC company has major fabrication plant in Kathmandu and Pokhara. The president want to know the equivalent future value of Rs 10,00,000 capital investments each year for 8 years, starting 1 year from now. ABC company yeo earns at rate 14% per year.

Given:

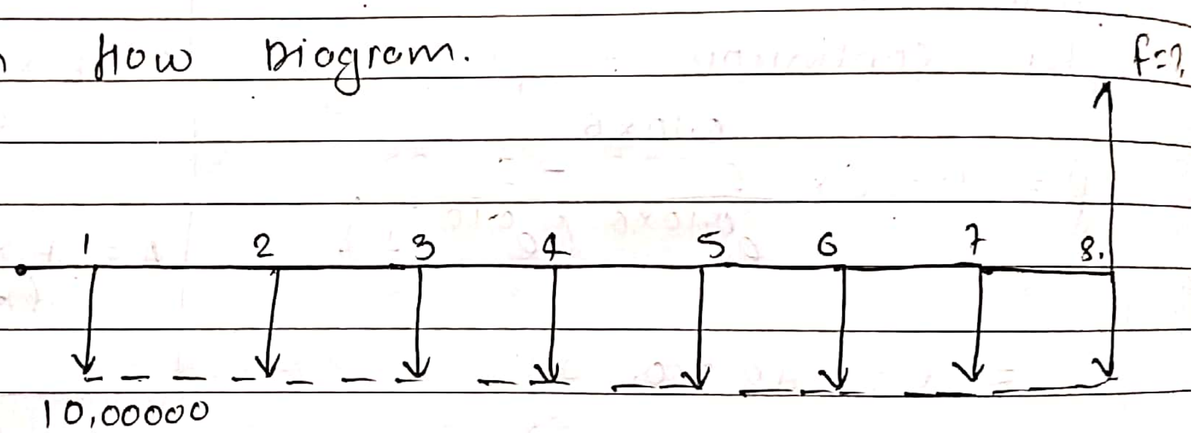
Per year investment (A) = Rs 10,00,000.

Intrest Rate (I) = 14% = 0.014.

Time (T) = 8 years.

Future value (F) = ?.

Cash flow Diagram.



$$f = A \times (F/A, 0.14, 8).$$

we know

$$f = A \times \frac{(1+0.14)^8 - 1}{0.14}$$

$$= \frac{10,00,000\ [(1+0.14)^8 - 1]}{(0.14)}$$

= Rs 13,232,760.16

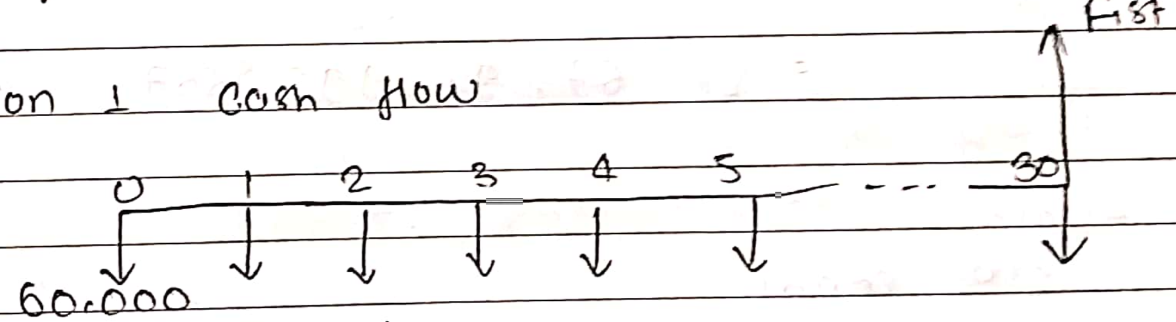
∴ The future value is Rs 1,32,32,760.16.//

Q.No. 13 ⇒

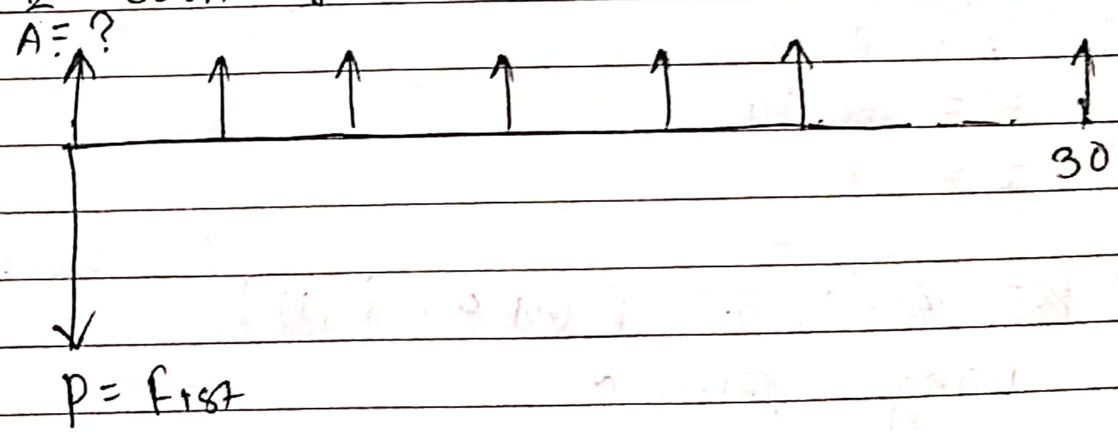
An engineer is planning for his early retirement 30 years from now. He believes he can comfortably set aside Rs 60,000 each year for ~~five year~~ 30 years, starting now. If he plans to start withdrawing money in some year that he makes his last deposit (ie year 30), what uniform amount could he withdraw each year for next 30 years. if the account earned interest at each year at a Rate of 8% per year.

Soln:

Condition 1 cash flow



Condition 2 cash flow.



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condition 1

A = 60000

N = 30 years

I = 8%

f = ?

we know

$$f = A\,(f/A,\ i,\ N).$$

using formula

$$\cancel{A}= f = \frac{6000 \times \left((1+i)^{N} - 1 \right)}{i}$$

$$= \frac{60000 \times \left[(1+0.08)^{30} - 1 \right]}{[0.08]}$$

$$= \text{Rs } 67,96,992.667.$$

Again,

2nd condition

P = Rs 67,96,992.667.

A = ?

N = 30 yrs

I = 8%.

Re= Alf. $A = P\,(A/P,\ i,\ N)$

using formula,

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$$A = 6796992.667 \times \frac{0.08 \times (1+0.08)^N}{[(1+0.08)^N - 1]}.$$

$$= 6796992.667 \times \frac{0.08 \times (1+0.08)^{30}}{([1+0.08]^{30} - 1)}$$

$$= \text{Rs } 603759.4134.$$

∴ we can withdraw Rs 603759.4134 for next 30 years, each year

Q.No.14 ⇒
Professional Engineers Require that Rs 5,000 each year be placed in a sinking fund account to cover any unexpected major rework on field equipment. In one case Rs 5,000 was deposited for 15 years and covered a rework costing Rs 10,00,000 in year 15. What rate of intrest did this practice provide the company.

Soln:-
Amount (A) = Rs 5,000.
Future Amount (F) = Rs 10,00,000.
Time (N) = 15 years.
Intrest Rate (I) = ?
Functionally

$$A = F \times (A/F, i, N).$$

So using formula,

$$A = \frac{P \times i}{(1+i)^N - 1}.$$

$$5000 = \frac{10,00,000 \times i}{(1+i)^{15} - 1}.$$

or. $$\frac{5000}{10,00,000} = \frac{i}{(1+i)^{15}-1}$$

or. $$5 \times 10^{-3} = \frac{i}{(1+i)^{15}-1}.$$

or $$(1+i)^{15} - 1 = \cancel{5 \times 10^{3} i}\ 200\,i$$

or. $$(1+i)^{15} = 200\,i + 1.$$

~~Taking log on both sides~~

$$\cancel{15 \ln(1+i) = \ln(200i+1)}.$$

~~Solving this~~

$$(1+i)^{15} = (1+i) + 199\,i$$

$$i = 0.3212.$$

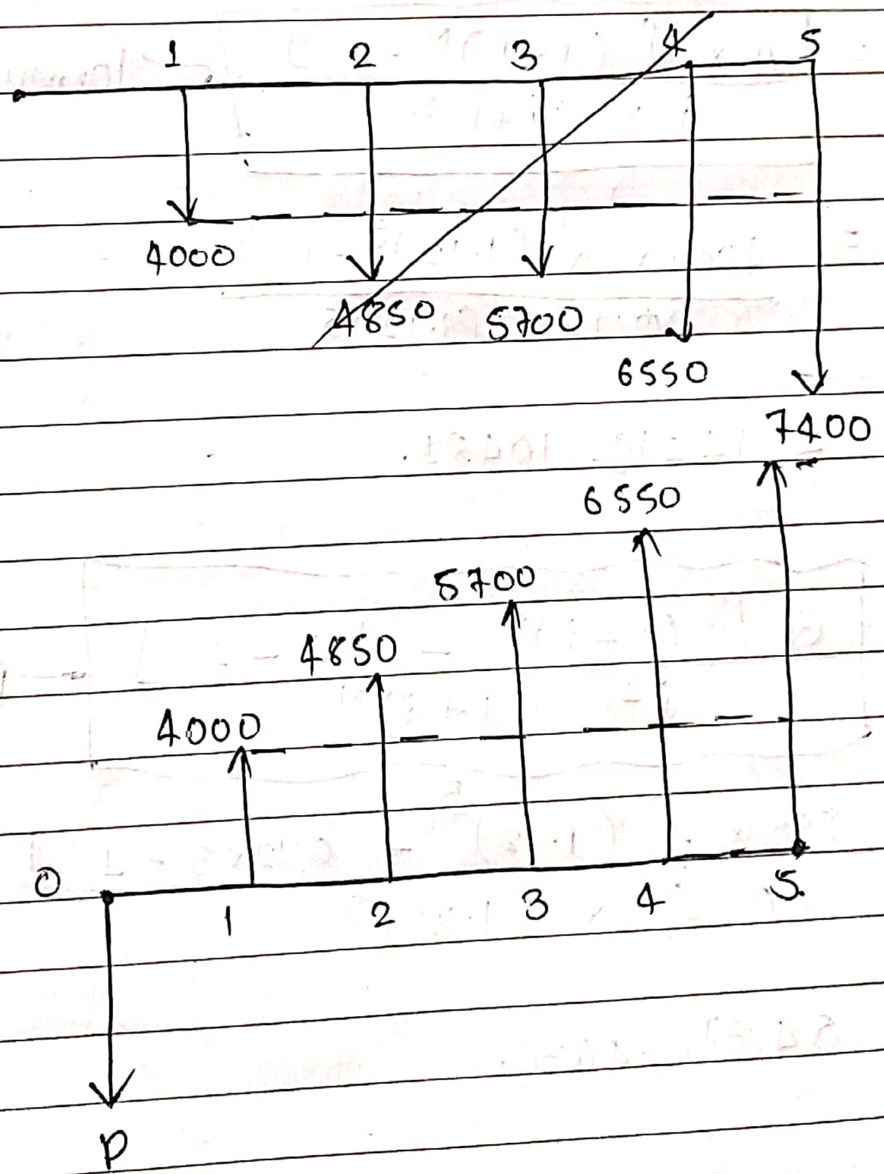
$$\therefore \quad i = 32.12\%.$$

$1 \times \log 1$ $\quad \frac{2 \times \log 2}{\log 200}^{1/15}$.

Q.NO.15,,

An equipment manufacturer is considering replacing its old spare parts with new one. The company excepts to achieve cost savings of Rs 4000 in 1st year and amount increases by Rs 850 each year for next 4 years. At an interest rate of 12% per year what is the total present worth of the savings?

Soln:



we have

Gradient Amount $(G) =$ Rs 850

Interest Rate $(i) = 12\%$.

Time $(N) = 4$ years

Present Amount $(P) = ?$

Equal Amount $(A) =$ Rs 4000.

Now.

$$P_A = A\,(PA/A,\ i,\ R)$$

$$= \boxed{\frac{A \times \{(i+1)^N - 1\}}{i \times (i+1)^N}}$$ formula

$$= \frac{4000 \times \{(1.12)^5 - 1\}}{0.12 \times (1.12)^5}$$

$$= 14419.10481.$$

$$P_G = \boxed{\frac{G\,[(1+i)^N - iN - 1]}{i^2\,(1+i)^N}}$$ formula.

$$= \frac{850 \times [(1.12)^5 - 0.12 \times 5 - 1]}{(0.12)^2 \times (1.12)^5}$$

$$= 5437.4636.$$

$$\therefore P_0 = P_A + P_G$$

$$= 14419.10481 + 5437.4636$$

= Rs 19856.56841

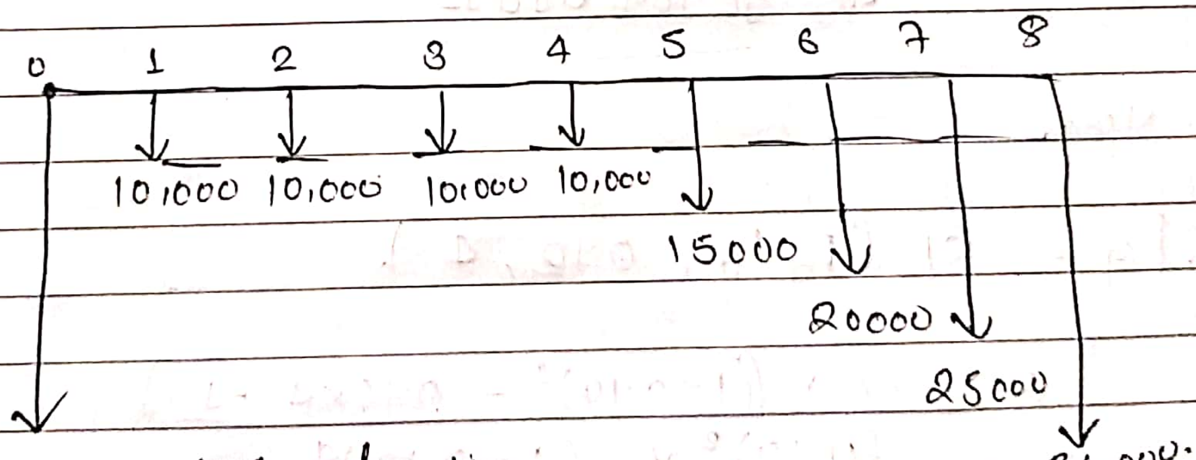
∴ The present worth of savings is Rs 19856.56841.

Q.No.16

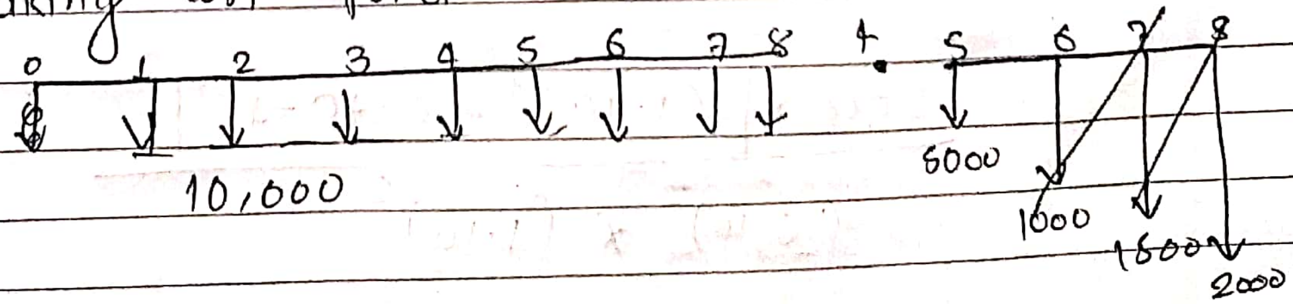
Mr Hem, an engineer has inspected the average cost on a current production for 8 years. Cost averages were steady at Rs 10,000 per completed unit for the first 4 years but have increased consistently by Rs 5,000 per unit for each of last 4 years. Hem plans to Analyze the Gradient increase using P/G factor. where is present worth located for Gradient ? what is the Gradient relation used to calculate total Present worth in year 0 ? i = 10%.

Soln:

Cost function



Breaking cost function



$= 21890.58124.$

$\therefore$ Present worth from 4th year to last four years is.

$P_4 = P_A + P_G$

$= 90909.09091 + 21890.58124$

$= 112799.6722.$

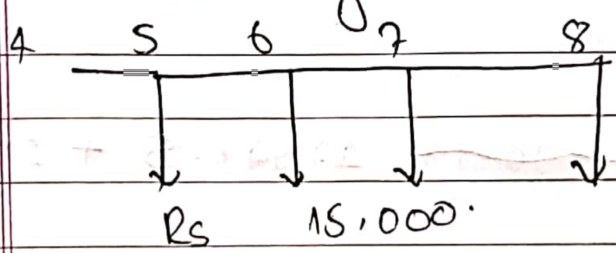
Now.

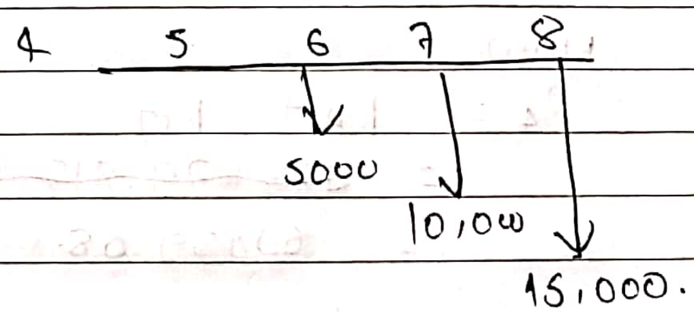
Present worth year start $P_0 = ?$

Now.

Gradient And Amount.

Breaking cost func.





$P_4 = A\,(PA/A,\ 0.10,\ 4).$

$= 15,000 \left(\dfrac{(1+0.10)^4 - 1}{0.10 \times (1+0.10)^4} \right)$

$= 15,000 \times 3.1699$

$=$ ~~47547.817.~~ 47548.5

Now

$P_G = G\,(P_G/G,\ i,\ N)$

Using formula.

$$P_G = \frac{G \times \{(i+1)^N - i \times N - 1\}}{i^2 \times (i+1)^N}$$

$$= \frac{5000 \times [(1.10)^4 - 0.1 \times 4 - 1]}{0.1^2 \times (1.1)^4}$$

$= 5000 \times 4.3781$
$= 21890.58.$

Now
$P_4 = P_A + P_G$
$= \cancel{475479.817 + 21890.58}\ 47548.5 + 21890.58$
$= 69439.08.$

Now:
$P_0 = P_4\,(P/F,\ 10\%.\ 4) + 10{,}000\,(P/A,\ 10\%,\ 4)$

$$= 69439.08 \times (1+0.1)^{-4} + \frac{10000 \times [(1.01)^4 - 1]}{(1.01)^4 \times 0.1}$$

$= \cancel{66729.59}^{\,47427.82} + \cancel{3??1}.\ 10000 \times 3.1698$
$= \cancel{66729.59} + 31698$
$= 47427.82 + 31698$
$= 79125.82$

$D.\ Total = \cancel{13179}.\ 7179.4 + 6000$
$= 13179.4\ Rs$

$\therefore$ Rs 13179.4 should be deposited.

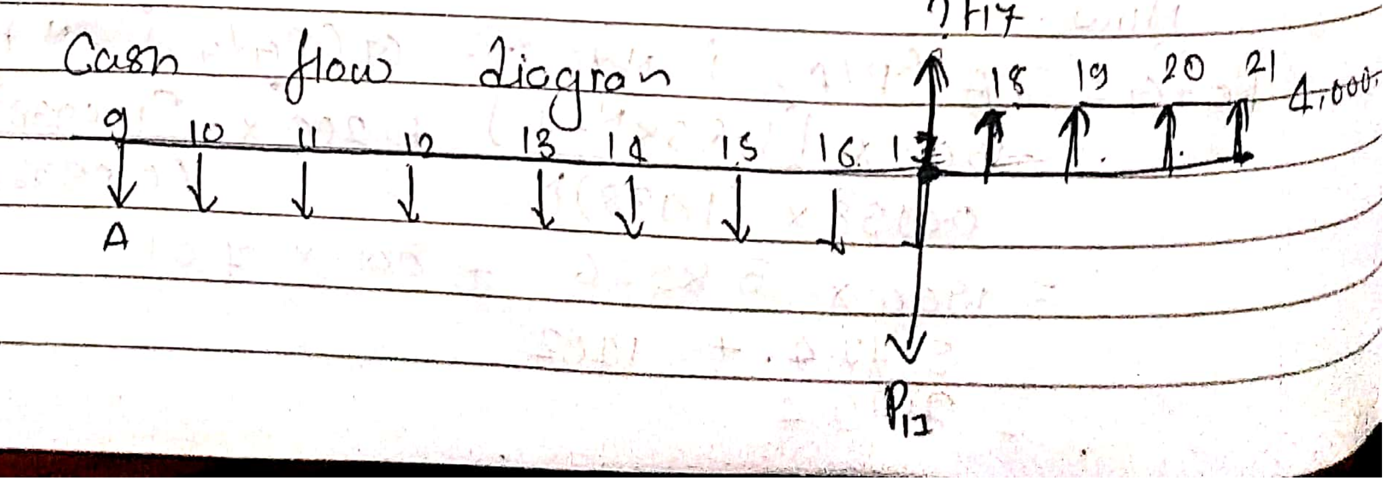
Q.No. 18 ⇒

A father wants to set aside money for his 8 years old son's college education, by making annual deposits to a bank account in his son's name that pays 8% per annum, compounded quarterly. What equal deposits must the father make on son's 9th through 17th birthdays, in order for the son to be able to withdraw Rs 4,000 on each of four birthdays from 18th to 21.

Solution:

Annual deposit Amount (A) = ?
Interest Rate (8% per annum compounded quarterly.
Amount for Last 4 year (At) = Rs 4,000.
Now.

Cash flow diagram



Now

for withdrawl / case.

$P_{17} = A\ (P_{17}/A,$

Now.

intrest Rate (I) = 8% pa compounded quarr-

~~i-eff~~ $m = 4$.

$$i_{eff} = \left(1 + \frac{0.08}{4}\right)^4 - 1$$

$= 0.08243$

$= 8.243\%$ per annum.

Now.

$P_{17} = A\ (P_{17}/A,\ 8.243\%,\ 4).$

$$= \frac{4000 \times \left((1.08243)^4 - 1\right)}{0.08243 \times (1.08243)^4}$$

$= 4000 \times 3.2943.$ 3.9673

$= 13177.2.$

$\therefore$ ~~Present~~ Total collected Amount for 9 years is Rs 13177.2.

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Now.

$P_{17} = F_{17}$.

Therefore.

$$A = F_{17} \left(A/F_{17},\ 0.08243,\ 9 \right).$$

$$= \frac{18177.2 \times 0.08243}{\left((1.08243)^9 - 1 \right)}$$

$$= Rs\ 1044.57.$$

∴ The equal deposits famer should make for 9 years is Rs 1044.57

Q. No. 20 ⇒.

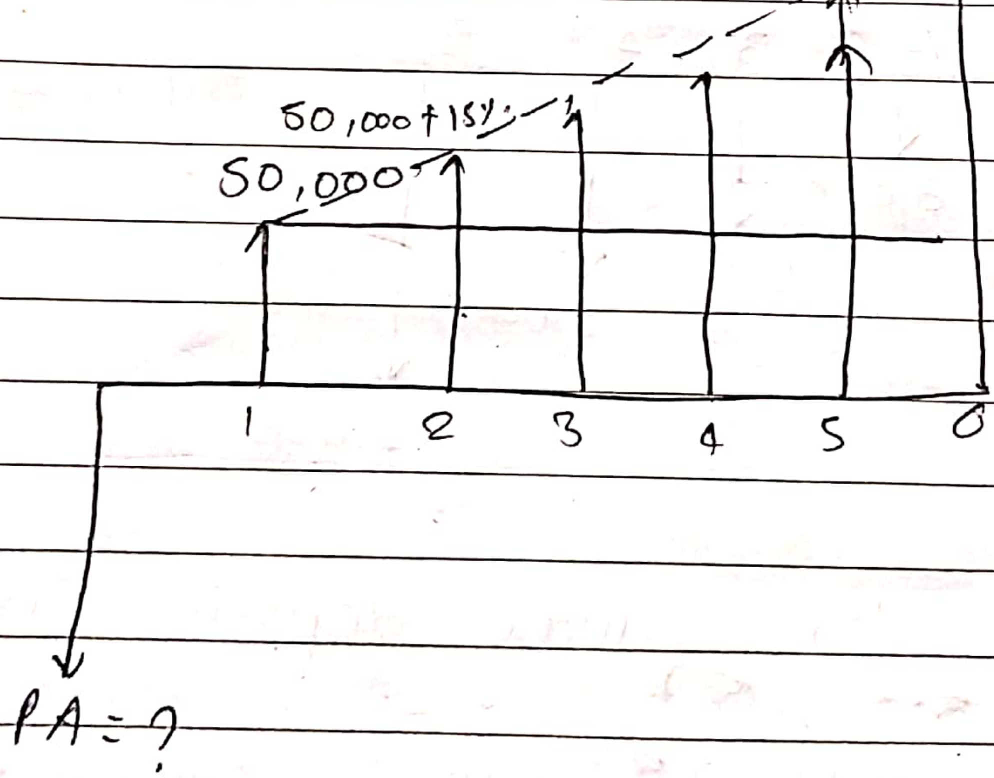
Amount (A) = 50,000.

Gradient factor (G) = 15%.

Introst rate (I) = 12%.

Time period (N) = 6 years.

Present value (P) = ?



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Now.
~~using~~
Here $i \neq g$,
Thus,

$$\boxed{P = A_1 \left[\frac{1 - (1+g)^N (1+i)^{-N}}{i-g} \right]}$$ formula.

$= 50{,}000 \times \left[\cancel{5.7289} \right] 5.72895.$

$= 286\ 447.62.$

∴ Required present value of cash flow is Rs 286,447.62

Q. No. 21 ⇒

gradient factor $(g) = 15\%$.
Interest Rate $(i) = \cancel{10}\ 5\%$.
Amount deposited = ~~Rs 400~~ 40,000.
Time period $(N) = 7$ years.
future worth $(F) = ?$

we know,

$F = A_1\ (F/A_1, g, i, N)$

Here $i \neq g$,
Thus,

$$P = \frac{10{,}000 \times \left[(1+0.05)^7 - (1+0.15)^7\right]}{0.05 - 0.15}$$

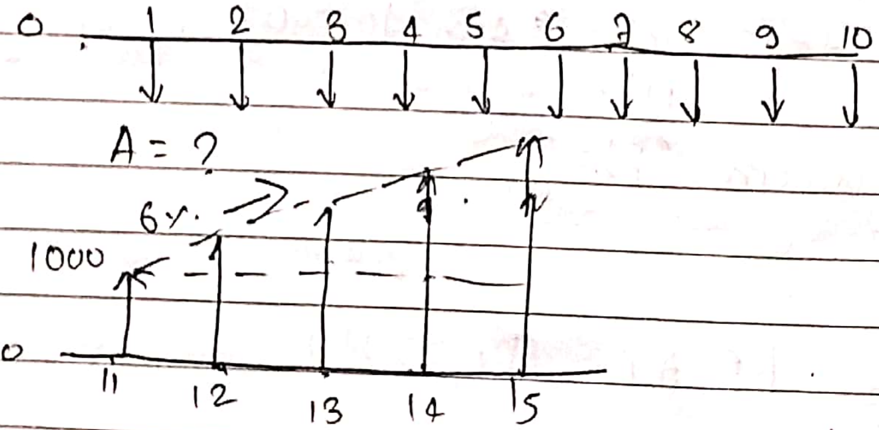
$= 10{,}000 \times 12.529$
$= 5{,}01{,}167.78$

$\therefore$ The Amount in account immediately after last deposit is Rs 5,01,167.78 Rs //

Q.No 22 =>
Given,

a) The intrest Rate is 8% compounded Annually
Annual deposits (A) = ?
Annual withdrawl (A) = \$ 10,000.

Cash flow diagram.



Now:

Amount withdrawl (A) = 1000
gradient Rate (g) = 6%
Now, using formula,

Present worth

$(P) = A_1 \,(P/A_1, g, i, N)$.

a ⟹ According to qn 1.

$i \neq g$.

Thus

$$P = A_1 \left[\frac{1 - (1+g)^N (1+i)^{-N}}{i-g} \right]$$

$$= 1000 \left[\frac{1 - (1+0.06)^5 (1+0.08)^{-5}}{(0.08 - 0.06)} \right]$$

$$= 1000 \; £ \times \cancel{25.0259} \quad 4.46130$$

$$= \cancel{25025.86271} \quad 4461.30$$

Now

$P_{10} = F_{10}$

Thus

$A_{10} = F_{10} (A/P, 0.08, 10)$.

$$= \frac{25025.86271 \times}{[(1.08)^{10} - 1]} \cancel{((1+0.08)^{10}) \times (0.08)}$$

$$A_{10} = \cancel{25025 \times} \; \frac{4461.30 \times 0.08}{(1.08)^{10} - 1}$$

$$= 307.96.$$

∴ The Required Amount is 307.96

b) Now.

when p i = g.

$$P = \left[N \times A_1 \Big/ (1+i) \right]$$

$$= \frac{5 \times 1000}{(1 + 0.06)}$$

$$= 4716.98$$

Now.

$P_{10} = f_{10}$ for deposited Amount.

$$A = \frac{f_{10} \times (0.06)}{(1.06)^{10} - 1}$$

$$= \frac{4716.98 \times 0.06}{(1.06)^{10} - 1}$$

$$= 357.87 \text{ Rs.}$$

$\therefore$ Rs 357.87 Rs should be deposited.

Q. No. 24.

Soln

Present Amount (P) = Rs 5,000
Time (T) = 36 months, monthly investment
intrest rate is 10% per year compounded continu

Here,
intrest rate (Monthly) = $(1+0.10)^{1/12}$
= 0.00797.
= 0.797%.

Therefore
Using continuous evaluation.

$A = P\,(A/B,\, i\%,\, n)$

$$= 5000 \times \frac{e^{0.00797\times 36}\left(e^{0.00797}-1\right)}{\left(e^{0.00797\times 36}-1\right)}$$

160.40

= 5000 × 0.03208
= Rs 160.40 should be paid.