MIND MAP

TIME VALUE OF MONEY

RITU JINDAL

Interest

Simple Interest

$S.I = \frac{Prt}{100}$

$P = \frac{S.I \times 100}{rt}$

$r = \frac{S.I \times 100}{Pt}$

$t = \frac{S.I \times 100}{Pr}$

Difference only Two Values

$S_1 - S_2 = \frac{(P_1 - P_2)rt}{100}$

$S_1 - S_2 = \frac{P(r_1 - r_2)t}{100}$

$S_1 - S_2 = \frac{Pr(t_1 - t_2)}{100}$

Simple Interest Types of Questions

Amount n times

$\frac{n \times 100}{r} = t$ or $\frac{(n-1) \times 100}{t} = r$

S.I. n times

$\frac{(n) \times 100}{r} = t$ or $\frac{(n) \times 100}{t} = r$

n_1 times in t_1 years, n_2 times in t_2 years

$\frac{n_1 - 1}{n_2 - 1} = \frac{t_1}{t_2}$

Divide Sum of Money Into Parts

$\frac{1}{r_1 t_1} : \frac{1}{r_2 t_2}$: Amount / S.I. Same

Amount for two Periods

1 year S.I. 1000 [5000 : 4 / 6000 : 8] 4

Conversion

Year into Month

Month into Year

Days into Month

Month into Days

C.I.

Divide Sum of Money into parts Amount Same

$\frac{1}{(1+i_1)^{n_1}} : \frac{1}{(1+i_2)^{n_2}}$

n_1 times + years, n_2 times ?

Eg. 2 times, 4 years, 64 times = ?

$2^6 \rightarrow 6 \times 4 = 24$

Compound Interest

Yearly: $A = P(1+i)^n$

Half Yearly: $\frac{i}{2}, 2n$

Quarterly: $\frac{i}{4}, 4n$

Monthly: $\frac{i}{12}, 12n$

Types of Questions

Sum Double: $\frac{69}{r} + .35$ or $\frac{72}{r}$

Sum Triple: $\frac{111.444}{r} + .35$ or $\frac{114}{r}$

More than 3 years Proper

Amount for Two Periods

Application of C.I.

Population: $FV = IV(1+i)^n$

Depreciation: $FV = IV(1-i)^n$

Effective Rate: $r = [(1+i)^n - 1]$

Difference between C.I and S.I

gap 2 years: Sum = diff $\left(\frac{100}{r}\right)^2$

gap 3 years: Sum = diff $\left[\frac{100}{r}\right]^2 \left(\frac{100}{300+r}\right)$

gap More than 3 years: C.I - S.I = $P\left((1+i)^n - 1 - it\right)$

MIND MAP

ANNUITY

RITU JINDAL

Future Value

- Ordinary
  - $FV = A\frac{[(1+i)^n - 1]}{i}$
- Immediate or Due
  - $FV = A\frac{[(1+i)^n - 1](1+i)}{i}$

Present Value

- Ordinary
  - $P.V = -A\frac{[(1+i)^{-n} - 1]}{i}$
- Immediate or Due
  - $P.V = -A\frac{[(1+i)^{-n} - 1](1+i)}{i}$

Compound Interest

$A = P(1+i)^n$

$P = \frac{A}{(1+i)^n}$ or

$i = \left(\frac{A}{P}\right)^{\frac{1}{n}} - 1$ or

for $n \Rightarrow \left(\frac{A}{P}\right) = (1+i)^n$

either GBC or taking log

Application of Annuity

- Sinking Fund
  - F.V.
- Leasing
  - P.V
- Capital Expenditure
  - P.V
- Valuation of Bond
  - P.V
- Perpetuity
  - forever
    - $= \frac{R}{i}$
  - Growing Perpetuity
    - $\frac{R}{i-g}$

Net Present Value

- N > 0
  - Accept
- N = 0
  - Depend
- N < 0
  - Reject

NPV → P.V of Cash inflow − P.V. of Cash outflow

Compound Annual Growth Rate

$Rate = \left(\frac{V(tn)}{V(to)}\right)^{\frac{1}{tn-to}} - 1$