Chap. 3 B.M

1. Simple Interest :-

1) Initial value [Interest] = $I = p \times i \times t$

2) Final value [Accumulated Amt] = $A = p + I$

2. Compound Interest :-

1) Interest for 1st yr = $I = pit$

2) Principal for the 2nd yr = principal for 1st yr + Interest for 1st yr

3) Compound Interest = Add Interest for all the yrs

4) Amount of last yr = principal [Initial amt] + C.I

3. Conversion period

1 day	C. daily	365
1 month	C. Monthly	12
3 "	C. Quaterly	4
6 "	C. Semi-Annually	2
12 "	C. "	1

$$A_n = P[1+i]^n$$

$$i = \frac{\text{Rate of interest}}{\text{No. of conversion period per yr}}$$

(5)

$$C.I = A_n - P$$

$$n = t \times \text{no. of conversion period per yr}$$

Similarly $C.I = A_n - P$

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

$$= P\left[(1+i)^n - 1\right]$$

(4) Effective rate of interest

$$I = PET$$

I = Amount of interest

P = principal amt

E = Effective rate of interest in decimal

T = Time period

(or)

Effective rate of interest directly $= E = (1+i)^n - 1$

(5) Future value $= F = CF(1+i)^n$

Whereas CF = cash flow

i) Future value of an annuity regular:-

$$A(n,i) = A\left[\frac{(1+i)^n - 1}{i}\right]$$

ii) Future value of Annuity due or immediate

i) ii) Multiply the result by $(1+i)$

(6)

Present value (V) = ~~$V = A \times P(n,i)$~~

i) ~~present value of annuity regular~~

$$A_n = P[1+i]^n$$

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

i) present value of annuity ~~due~~ regular

~~regular~~

$$A = \frac{V}{P(ni)} \qquad P(ni) = \frac{(1+i)^n - 1}{i(1+i^n)}$$

$$V = A \times P(ni)$$

ii) present value of annuity due or immediate

i) $V = A \times P(ni)$

ii) total Cash + Amount

(7) Sinking fund :-

$$A = P \times A(ni)$$

$$A(ni) = A \boxed{\frac{(1+i)^n - 1}{i}}$$

(8) Applications :-

i) Leasing $V = A \times P(ni)$

ii) Capital = "

iii) Valuation of Bond :-

$$\frac{100}{(1+i)^{1}} + \frac{100}{(1+i)^{2}} + \frac{100}{(1+i)^{3}}$$

(9) perpetuity :- i) multi. period perpetuity

$$PVA = \frac{R}{i}$$

ii) growing perpetuity

$$PVA = \frac{R}{i-g}$$

i - discount rate or interest ra

g = growth rate i intere

(10) Nominal rate of return :-

Nominal rate of return - Inflation rate = Real rate of return

Nominal rate interest = Real rate interest + Inflation

(11) Compound Annual growth rate :-

$$CAGR_{(t_0, t_n)} = \left[\frac{V(t_n)}{V(t_0)}\right]^{\frac{1}{t_n - t_0}} - 1$$