DAFFODIL INSTITUTE OF IT (DIIT)

BBA (Honours) in Tourism and Hospitality Management (THM)

Third Year Sixth Semester

Fundamentals of Finance

Chapter- 3

Time Value of Money and its Application (Math)

Problem- 1

If the periodical rate of interest is 5% and you borrowed Tk 10000, how much you have to pay in each instalment if the principal amount is killed off by 10 instalments?

Solution: Given,

R= 0.05

n= 10 years

PV= 10000

Annual instalment (A) =?

We know,

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

$$=>10000 = A\left[\frac{1}{0.05} - \frac{1}{0.05(1+0.05)^{10}}\right]$$

$$=>10000 = A\ [20 - 12.27826]$$

$$=>10000 = A\ (7.7217)$$

$$=> A\ (7.7217) = 10000$$

$$=> A = 10000 \div 7.7217$$

A= 1295.05 Ans.

Problem-2

Mr. Alam deposits Tk 10000 in a bank now. The interest rate is 10% and compounding is done Semi-annually. What will be the deposit grow after 10 years? If the inflation rate is 8%, what will be the value of deposit after 10 years in terms of the current 1aka?

Solution: Given that,

PV = 10000

R= 0.10 ÷ 2 = 0.05

n= 10 × 2= 20 times

Future Value (FV) =?

WE know,

$$FV = PV\ (1 + R)^n$$

$$= 10000\ (1 + 0.05)^{20}$$

= 26533 Ans.

If the inflation rate (IR) = 0.08, then PV=?

$PV=FV \div (1+IR)^{n}$

$=26533 \div (1+0.08)^{10}$

$= 12290$ Ans.

Problem-3

Mr. Ashfaque borrows Tk 5, 00,000 from the bank at 12% interest rate compounded annually to purchase a land. The loan is repaid in equal annual instalment at the end of each year over the next five years. How much will each annual payment be?

Solution: Given,

PV= 5, 00,000

R = 0.12

n = 5 yrs.

A=?

We know,

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

$$=>5,00,000 = A\left[\frac{1}{0.12} - \frac{1}{0.12(1+0.12)^{5}}\right]$$

$=>5, 00,000 = A\ (3.6048)$

$=> A\ (3.6048) = 5, 00,000$

$=> A = 5, 00,000 \div 3.6048$

$\therefore$ A =1, 38,705 Ans.

Problem-4

Exactly ten years from now Mr. Zaber will start receiving a pension of Tk 3000 a year. The payment will continue for sixteen years. How much is the pension worth now, if Mr. Zaber's interest rate is 10%?

Solution:

After 10 year from now given that,

Amount of annuity (A) = Tk 3000

Rate of interest (R) = 0.10

Number of years (N) = 16 yrs.

Present value (PV) =?

We know,

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

$$= 3000\left[\frac{1}{0.10} - \frac{1}{0.10(1+0.10)^{16}}\right]$$

= 23, 471.125 which is the present value of after 10 year from now. But it is the future value for now. So for now,

Future value (FV) = 23, 471

Number of years (N) = 10 yrs.

Rate of interest (R) = .10

Present value (PV) =?

We know,

$PV = FV \div (1+R)^{10}$

$=23, 471\ (1+0.10)^{10}$

= 9049.08 Ans.
