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 - 11

(A) Calculate the terminal value of Tk 12000 deposited in a bank account for next 10 years. The deposit will be made in the beginning of each of the year. Interest rate is14%.

(B) What will the terminal value if the deposits are made at the end of each of the year?

Solution: (A) Given,

A= 12000

N= 10 Yrs.

R= 0.14

Requirement: Terminal Value or Future Value (FV) =?

We know,

$$\text{FVa} = \frac{A(1+R)\{(1+R)^n-1\}}{R}$$

$$= \frac{12{,}000(1+.14)\{(1+.14)^{10}-1\}}{.14}$$

= 2, 64,534 Ans.

(B) $$\text{FVa} = \frac{A\{(1+R)^n-1\}}{R}$$

$$= \frac{12{,}000\{(1+.14)^{10}-1\}}{.14}$$

=2,32,048 Ans.

Problem -12

Determine the amount of money in a savings account at the end of 5 years given an initial deposit 4500 and 8.5% annual interest rate. When the interest is compounded (i) Semi-annually, (ii) Quarterly.

Solution: Given,

Present Value (PV) = 4500

Number of Years (n) =5 yrs.

Interest Rate (R) = 0.085

Requirement: Future Value (FV)=?

We know,

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

$$= 4500\ (1 + 0.085)^5$$

= 6766 Ans.

(i) For semi-annual interest,

n = 5×2 = 10 yrs.

R= 0.085 ÷ 2= 0.0425

We know,

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

$$= 4500\ (1+0.0425)^{10}$$

= 6823 Ans.

(ii) For quarterly interest,

n= 5 ×4= 20 times

R= 0.085÷ 4= 0.02125

We know,

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

$$= 4500\ (1 + 0.02125)$$

= 6853 Ans.

Problem-13

Joly and Jalil have just had their first child. If college is expected to cost Tk 2,50,000 per year in 18 years, how much the couple should began depositing annually at the end of each year to accumulate enough funds to pay the first year's tuition at the beginning of the 19 year? Assume that they can earn a 9% annual rate of return on their investment.

Solution: Given,

Future value (FV) = Tk 2,50,000

Rate of interest (R) = 0.09

Number of years (N) = 18 Yrs.

Requirement: Instalment (A) = ?

We know,

$$FVa = \frac{A(1+R)\{(1+R)^n - 1\}}{R}$$

$$FV = \frac{A\{(1+R)^n - 1\}}{R}$$

⇨ $2,50,000 = \frac{A\{(1+.09)^{18} - 1\}}{.09}$

⇨ $2,50,000 = A\ (41.130)$

⇨ A= 6053

Problem- 14

Exactly ten years from now Mariha Zaman will start receiving a pension of Tk 10000 a year. The payment will continue for twenty years. How much the pension worth now, it the time preference rate is 10%?