BUSM 5773: MBA FINANCE

Week 6 Problems

Institution

Question 1

Using compound interest formula:

$A = P(1 + \frac{R}{100})^n$………………………………………………………………….. 1(a)

Where:

A is the amount after appreciation;

P is the principal (money invested);

R is the interest rate; and

n represents the number of years.

Given P= $12,000, r = 8%, and n = 7, substituting the values into equation (a) we get the following.

$A = 12{,}000(1 + \frac{8}{100})^7$ ……………………………………………………………………1 (b)

$= 12{,}000 \times 1.08^7 = 12{,}000 \times 1.71382427 = \$20{,}565.89123$

Value after 7 years = $\$\mathbf{20,565.89123}$

Question 2

Apply equation 1 (a)

$A = P(1 + \frac{R}{100})^n$ ………………………………………………………………………….. 2 (a)

P = $2,000, a = $2,000×2 = $4,000, R= 8%.

Introducing logarithms on both sides of equation 2 (a), we obtain the following relationship.

Log (A) = nlog P + log (1+0.08) = nlog P + log (1.08)……………………………………….2 (b)

Substituting the values of P, A & R into equation 2(b), we arrive at:

Log (4,000) = nlog2, 000 + log (1.08)……………………………………………………2(c)

3.60206 = 3.30103n + 0.03342……………………………………………………...2(d)

3.60206 – 0.03342 = 3.30103n

3.56864 = 3.30103n…..2(e)

$n = \frac{3.56864}{3.30103} = 1.08$

Taking the reverse log of 1.08, n = 12 years.

Question 3 (a)

Net Present Value

Machine A

C, 0	**C, 1**	**C, 2**
-100	+110	+121

C stands for compound interest.

The present value, PV = -$100,000 SINCW $100,000 has been invested on machine A.

Rate of interest is 10%.

Now

PV = -$100,000

Yearly payments:

Year 1 payment = $110,000 – $100,000 = **$10,000**

Year 2 Payment: $121,000 – $110,000 = $11,000

Now: PV = -$100,000

Year 1: PV = $\frac{410,000}{1.10}$ = $9090.91

Year 2: PV = $\frac{411,000}{1.10^2}$ = $9090.91

Year 2 final payment = $121,000.

NPV = -\$100,000 + \$9090.91 + \$9090.91 + \$121,000 = \$139,181.8182 - \$100,000 =

NPV = \$39,181.8182

Machine B

Now: PV = -\$120,000

Year 1: PV = $\frac{-\$10,000}{1.10}$ = **-\$9090.91**

Year 2: PV = $\frac{(\$121,000-4110,000)}{(1.1O)^2}$ = $\frac{\$11,000}{(1.10)^2}$ = **\$9090.91**

Year 3: PV = $\frac{\$133,000-\$121,000)}{(1.1O)^3}$ = $\frac{\$12000}{(1.1O)^3}$ = **\$9015.778**

Final year payment is \$133,000

Adding them up to acquire NVP

NVP = - \$120,000 - \$9090.91 + \$9090.91 + \$9015.778 + \$133,000

NVP = \$22,015.778

Question 3 (b)

The mathematical model of equivalent annual cash flow (EACF) is as shown below.

EACF = $\frac{c\times discount\ rate}{(1-[1+discount\ rate)^{-n}}$

Where c = cash flow, n= number of periods,

Machine A

C = NPV = \$39,181.8182

EACF = $\frac{\$39,181.8182\times 0.1}{(1-[1+0.1)^{-2}}$ = **\$195,909.141**

Machine B

EACF = $\frac{\$22,015.778\times 0.1}{(1-[1+0.1)^{-3}}$ = **\$88,063**

Question 3 (c)

Machine B is the machine to buy because it has a low equivalent annual cash flow of $88,063.

Question 4 (a)

Working capital = current assets minus current liabilities.

The introduction of a new product or the expansion of the production of an existing product uses a lot of resources and yet the product – new or upgrade – is not known by people. Such a product would require an intense advertising campaign to make it popular. The new or upgraded product might also need new equipment, work force, office, and even stores. Thus there must be a serious investment in net working capital to fund the production and advertising.

Question 4 (b)

Net working capital must be used prudently under the supervision of an accountant. Forecasting changes in the net working capital should not be executed as long as the money payable does not exceed money receivable. Ensure to not spend more than is available.