2022 1st Semester Engineering Economy

Assignment Chapter 2

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\*

1K = 1,000

1M = 1,000,000 = 1,000K

1B = 1,000,000,000 = 1,000M = 1,000,000K

**2.18**

Future Worth of “Extra Value” = 600,000 \* (F/A, 10%, 3) \* 0.04

= 600,000 \* 3.31 \* 0.04 = **79,440**

**2.22**

MARR = 12% = i

P = 110000 \* 0.3 \* (P/A, 12%, 4) = 110000 \* 0.3 \* 3.0373 = **100,230.9**

**2.36**

available 2.1B after 5 years later + uniformly increasing money

i = 18%, n = 5

100M in year 1

P = 2.1B(P/F,18%,5) = 917.91M

917.91M = 100M(P/A,18%,5)+G(P/G,18%,5)

G=115.688561M = **115,688,561** = Answer

**2.45**

(i=8%), (g = 10%), (n = 5)

Pg = A1{1- [(1+g)/(1+i)]n}/(i-g) = 240.215M

A = Pg(A/P, 8%, 5) = 6.0164M

End-year-bonus = 1% of total sales revenue

0.01A = Answer = **60164**

**2.53**

$400K in 5 years

year 1 = $320K

G = $50K

$400K = $320K + $50K(A/G,i,5)

(A/G,i,5) = 1.6

if i= 22%

(A/G,22%,5) = 1.6090

if i = 24%

(A/G,24%,5) = 1.5782

Answer = **22<i<24**, not sure exact number of i.

**2.60**

Rate of return = 7% = i

G = 10%

A1 = $10000

Pg = = A1{1- [(1+g)/(1+i)]n}/(i-g)

Present Worth = PV(7%,n,,2000000) = 10000\*(1-(1.1/1.07)^n)/(-0.03)

if n = 25

PV(7%,25,,2000000) = 368498 > 10000\*(1-(1.1/1.07)^25)/(-0.03) = 332095

if n = 26

PV(7%,26,,2000000) = 368498 < 10000\*(1-(1.1/1.07)^26)/(-0.03) = 332095

So, n is between 25 and 26, 25<n<26.

At least 26 years required.

Answer = **26** years

**2.65**

**a)**

#1 0.01m -> 10000

#2 0.017m -> 17000

#3 0.025m -> 25000

**b)**

Use PMT function, (i =6%), (n=10), (P -> a)’s answers)

Annual Worth = -PMT(6%,10,,P)

|  |  |  |  |
| --- | --- | --- | --- |
| Bid | Amount of bid | Savings | Annual Worth |
| #1 | $1.060M | 10000 | 1358.680 |
| #2 | $1.052M | 17000 | 2309.755 |
| #3 | $1.045M | 25000 | 3396.699 |

**c)**

**2.79**

(A = 7000), (i = 10%), (n = 5)

Present Worth for 5 years = 28800

G = (28800-7000\*3.7908)/(6.8618) = 330.0009 330

Answer : **d) $330**