

Final Exam

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Engineering E & M.

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Q1 (a).

Given data:

Rs. 100 million,

$N = 6$

$i = 8\%$

Soln:

we know that,

$$P = F \left(\frac{1}{1+i} \right)^n \quad \text{--- (A)}$$

By putting values in (A).

$$P = 100000000 \left(\frac{1}{1+0.08} \right)^6$$

$$P = 100000000 \left(\frac{1}{1.08} \right)^6$$

$$P = 100000000 (0.6302).$$

$$P = 63,016,962.69$$

X — X — X.

Q1 (b)

$$i = 6\%$$

Soln:

As we know that

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

$$10000000 = 1000000 \left[\frac{(1+0.06)^n - 1}{(0.06)(1+0.06)^n} \right]$$

$$\frac{10000000}{1000000} = \left[\frac{(1+0.06)^n - 1}{(0.06)(1+0.06)^n} \right]$$

$$10 = \left[\frac{(1+0.06)^n - 1}{(0.06)(1+0.06)^n} \right]$$

$$\Rightarrow 10 \times (0.06)(1+0.06)^n = (1+0.06)^n - 1$$

$$0.6 \times (1.06)^n = (1.06)^n - 1$$

$$\Rightarrow (1.06)^n - 0.6(1.06)^n = 1$$

$$\Rightarrow (1.06)^n [1 - 0.6] = 1$$

$$\Rightarrow (1.06)^n (0.4) = 1$$

$$\Rightarrow (1.06)^n = \frac{1}{0.4}$$

$$\Rightarrow (1.06)^n = 2.5$$

Taking \ln ;

$$\ln 2.5 = n \times \ln(1.06)$$

$$0.916 = n \times 0.0583$$

$$n = \frac{0.916}{0.0583}$$

$$n = 15.7 \text{ years.}$$

$$N = 15.7 \text{ years.}$$

x ————— x ————— x.

Q#2 (a)

Given data:

$$A = 30 \text{ million.}$$

$$i = 15\% = 0.15$$

$$N = 5 \text{ years.}$$

Soln:

we know that.

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

Putting values.

$$P = 30000000 \left[\frac{(1+0.15)^5 - 1}{0.15(1+0.15)^5} \right]$$

$$P = 30000000 \left[\frac{1.0774}{0.15(1.15)^5} \right]$$

$$P = 30000000 \left[\frac{1.0774}{0.3017} \right]$$

$$P = 30000000 [3.5722]$$

$$P = 1071660000$$

Ans

x ——— x

x

Q2 (b)

Given data:

$$A = \$10000$$

$$i = 5\%$$

$$n = 15 \text{ years}$$

Soln:-

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

Putting values.

$$F = 10000 \left[\frac{(1+0.05)^{15} - 1}{0.05} \right]$$

$$F = 10000 [21.5786]$$

$$F = \$215786$$

X ——— X ———> X

Q 3 (a)

Answer:

Property depreciable is any asset that is eligible for tax and accounting purpose to book depreciation in accordance with the Internal Revenue Service (IRS) Rules.

Property is depreciable if it met the following basic arguments.

=> It must be used so much that wears out, decay gets used up become obsolete or less value from natural cause.

=> It must be used in business or held to produce income.

=> It must have useful life and the life must be longer than one year.

x ——— x ——— x .

Q3 (b) Solution.

From we know that

$$dV = (B - SVN) \left[\frac{2(N - k + 1)}{N(N + 1)} \right]$$

$$B_{V_k} = B - \left[2 \left[\frac{B - SVN}{N} \right] k \right] + \left[\frac{(B - SVN)}{N(N + 1)} \right] \times (k + 1)$$

Putting value for sample (1).

$$d_1 = 400000 \left[\frac{2(10 + 1 - 1)}{10(10 + 1)} \right]$$

$$d_1 = 400000 (0.1818)$$

$$d_1 = 72720$$

$$B_{V_1} = 400000 - \left[\frac{2(400000 \times 1)}{10} \right] + \left[\frac{400000}{10(11)} \right] \times 2$$

$$\Rightarrow 400000 - [80000] + \left[\frac{400000}{110} \right] \times 2$$

$$\Rightarrow 400000 - 80000 + 7272.7$$

$$\Rightarrow 327272.7$$

For d_2 .

$$d_2 = 400000 \left[\frac{2(10 - 2 + 1)}{10(10 + 1)} \right]$$

$$d_2 = 400000 \left[\frac{18}{110} \right]$$

$$d_2 = 65454.5$$

P-8

$$BV_2 = 400000 - \left[2 \left(\frac{400000}{10} \right) \right] \times 2 + \left[\frac{400000}{10(11)} \right] \times 3$$

$$\Rightarrow 400000 - 80000 \times 2 + \left[\frac{400000}{110} \right] \times 6$$

$$\Rightarrow 400000 - 160000 + 3636.36 \times 6$$

$$\Rightarrow 400000 - 160000 + 21818.16$$

$$\Rightarrow 261818.16$$

$$d_3 = 400000 \left[\frac{2(10-3+1)}{10(10+1)} \right]$$

$$d_3 = 400000 \left[\frac{2(8)}{110} \right]$$

$$d_3 = 400000 \left[0.1454 \right]$$

$$d_3 = 58,181.81$$

P-9.

$$BV_3 = 400000 - \left[2 \left(\frac{400000}{10} \right) \right] \times 3 + \left[\frac{400000}{110} \right] \times 3 \times 4$$

$$BV_3 = 400000 - (80,000) \times 3 + (3636.36) \times 12$$

$$BV_3 = 400000 - 240000 + 43636.36$$

$$BV_3 = 400000 + 43636.36 - 240000$$

$$BV_3 = 443,636.36 - 240,000$$

$$BV_3 = 203,636.36$$

$$d_4 = 400000 \left[\frac{2(10-4+1)}{10(10+1)} \right]$$

$$= 400000 \left[\frac{2(7)}{110} \right]$$

$$= 50909.0909$$

$$BV_4 = 400000 + \left[2 \left(\frac{400000}{10} \right) \times 4 + \left[\frac{400000}{110} \right] 4 \times 3 \right]$$

$$= 400000 + 320000 + 72727.2727$$

$$= 792727.2727$$

$$d_5 = 400000 \left[\frac{2(10-5+1)}{10(10+1)} \right]$$

$$d_5 = 400000 \left[\frac{2(6)}{110} \right]$$

$$d_5 = 400000 \left[\frac{12}{110} \right]$$

$$d_5 = 4363.3$$

$$BV_5 = 400000 - \left[2 \left(\frac{400000}{10} \right) \right] \times 5 + \left[\frac{400000}{110} \right] 5 \times 4$$

$$400000 = 400000 + 72727.2$$

$$BV_5 = 727277.2$$

$$d_6 = 400000 \left[\frac{2(10 - 6 + 1)}{70(10 + 1)} \right]$$

$$d_6 = 400000 \left[\frac{2(5)}{770} \right]$$

$$d_6 = 36363.6$$

1x3

$$BV_6 = 400000 - \left[\frac{2(400000)}{70} \right] \times 6 + \left[\frac{400000}{770} \right] \times 6 \times 7$$

$$= 400000 - 480000 + 152727$$

$$\Rightarrow 72727$$

$$d_7 = 400000 \left[\frac{2(10 - 7 + 1)}{110} \right]$$

$$d_7 = 400000 \left[\frac{2(4)}{110} \right]$$

$$d_7 = 29090.90$$

$$BV_7 = 400000 - \left[\frac{2(400000)}{110} \right] \times 7 + \left[\frac{400000}{110} \right] \times 7 \times 8$$

1x4

$$BV_7 = 400000 - 960000 + 203636.36$$

$$\Rightarrow 43636.36$$

$$d_8 = 400000 \left[\frac{2(10+8+1)}{110} \right]$$

$$d_8 = 400000 \left[\frac{2(3)}{110} \right]$$

$$d_8 = 21818.18$$

$$B_{v_8} = 400000 - \left[\frac{2(400000)}{10} \right] \times 8 + \left[\frac{400000}{110} \right] \times 8 \times 9$$

$$= 400000 - 840000 + 3636.36 \times 72$$

$$B_{v_8} = 21818.18$$

$$d_9 = 400000 \left[\frac{2(10-9+1)}{110} \right]$$

$$d_9 = 14545.4$$

$$B_{v_9} = 400000 - \left[\frac{2(400000)}{10} \right] \times 9 + \left[\frac{400000}{110} \right] \times 9 \times 10$$

$$= 400000 - 720000 + 327272.7$$

$$B_{v_9} = 7272.9$$

x ————— x ————— x

Q4(a) Given data:

Gross Income = \$ 50,000.
 Cost of gold sold = \$ 20,000;
 Depreciation on DCM = \$ 4,000
 operating expensy = \$ 6,000.

Gross Income & expenses as started; income-tax rate = 40%.

Soln:

Consider the purchase of the machine to have been made at the end of year, zero which is also the beginning of year code.

| | |
|-------------------|------------|
| Gross Income | \$ 50,000. |
| Cost of gold sold | \$ 20,000 |
| Depreciation | \$ 2,000 |
| operating expensy | \$ 6,000 |
| Taxable Income | \$ 20,000. |
| Tax - 40%. | \$ 8,000. |

Net Income = 12,000.

X ——— X ——— X

Q4 (b)

Answer:

Benefits:

With this proposed park public primary health will improve. Besides that a new recreational activity will be added in the city of Abbotabad with new recreational activity local people and also people from outside will pay a visit to this park. Thus increasing its value in terms of financial activities, substitute business like cafe etc.

Costs:

As land already available so the park building cost will be low and also government is planning to issue bonds. so the cost won't be a big issue. They can't be a big issue. They can manage it in low cost.

Dis benefits:

If not properly managed they can damage the nature and issuance of bonds might be an issue which is a considerable factor.

x ————— x ————— x .

Q9 (a)

Given data:

Land Investment cost \$ 50,000
 Building Invested " \$ 225,000
 study period \$ 20 years

upkeep expenses per unit per month \$ 30
 property taxes and insurance 10%

Soln:

To determine the equivalent
 AW of all costs at the MARR
 of 12% per year.

⇒ To earn exactly 12% the
 annual rental income, adjusted
 for 90% occupancy, must
 equal the AW of costs.

$$\begin{aligned} \text{Initial Investment cost} &= \$ 50,000 + 225,000 \\ &= \$ 275,000 \end{aligned}$$

Taxes Insurance per year.

$$= 0.1 (\$ 275,000)$$

$$= \$ 27,500$$

$$\begin{aligned} \text{up keep/year} &= \$30(12 \times 30)(0.9) \\ &= \$9720. \end{aligned}$$

$$\begin{aligned} \text{CR cost/year} &= \$275000(A/P, 12\%, 20) \\ &= \$50,000(A/P, 12\%, 20) \\ &= \$36,123. \end{aligned}$$

\Rightarrow Assume that investment in land is recovered at the year of 20.

$$\begin{aligned} \text{Equivalent AW (of cost)} &= \$275000 - \$9720 \\ &= \$73343 \\ &= \$73343. \end{aligned}$$

\therefore minimum annual rental required equals \$73343 and with annual compounding, monthly rental amount R is

$$\begin{aligned} &= \$73343 / (12 \times 30)(0.9) \\ &= \$226.36. \end{aligned}$$

X — X — X .