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Final examination

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Q.#01 part (a)

As we know That

$$P = F(1/1+n)^n$$

Putting the values

$$P = 1,000,00000 \left(\frac{1}{1+0.08}\right)^6$$

$$P = 100,000,000 \left(\frac{1}{1.08}\right)^6$$

$$P = 100,000,000 \ (0.6302)$$

$$\boxed{P = 63,020,000}$$

Q #1 part (b)

As we know that

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

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

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

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

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

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

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

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

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

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

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

Taking ln

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

$$0.916 = n \times 0.0583$$

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

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

Q#2 part (a)

A = 30 millions
i = 15% => 0.15
N = 5 years

As we know that

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

Now putting values

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

$$P = 30000000\left[\frac{(1.15)^5 - 1}{0.15(1.15)^5}\right]$$

$$P = 30000000\left[\frac{1.0114}{0.15(1.15)^5}\right]$$

$$P = 30000000\left[\frac{1.0114}{0.3017}\right]$$

$$P = 30000000\left[3.3522\right]$$

$$\boxed{P = 100566000}$$

Q#2 part (b)

$A = 10,000$
$i = 5\% \Rightarrow 0.05$
$N = 15$ years

As we know that

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

Now putting values

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

$$F = 10000\left[21.5786\right]$$

$$\boxed{F = 215786 \$}$$

Q#3 part (a)

Basic requirement are;

(i) It must be used in business or held to produce income.

(ii) It must have a useful life and the life must be longer than one year.

(iii) It must be something that wears out, decays, gets used up, becomes obsolete or loss value from natural causes.

Q # 03 part (b)

Solution: As we know that

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

$$BVK = B - \left[2\frac{(B-SVN)}{N}\right]K + \left[(B-SVN)/N(N+1)\right] \times K(K+1)$$

Putting value for Sample (1)

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

$$d_1 = 400000\left[2\frac{(10)}{10(11)}\right]$$

$$d_1 = 400000 \quad (0.1818)$$

$$d_1 = 72720$$

$$BV_1 = 400000\left[\frac{2(400000)}{10}\times 1\right] + \left[\frac{400000}{10(11)}\right] 1(1+1).$$

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

$$400000 - 80000 + 7272.7$$

$$\Rightarrow 327272.7$$

For d2

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

$$d_2 = 400000 \left[\frac{2(8+1)}{10(11)}\right]$$

$$d_2 = 400000 \left[\frac{2(9)}{110}\right]$$

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

$$d_2 = 6545.4.5$$

$$BV_2 =$$

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

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

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

$$400000 - 160000 + 2118.16$$

$$\Rightarrow 261818.16$$

$$d3 = 400000 \left[\frac{2(10-3)+1}{10(10+1}\right]$$

$$d3 = 400000 \left[\frac{2(8)}{10(11)}\right]$$

$$d3 = 400000 \left[\frac{16}{110}\right)$$

$$d3 = 581,818$$

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

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

$$= 50\,909.0909$$

$$BV_4 = 400000 + \left[\frac{2(400000)}{10}\right]\times 4 + \left[\frac{400000}{110}\right]4\times 5$$

$$= 400000 + [320000] + 72727.27$$

$$= 792727.2727.$$

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

$$= 43636.3$$

BV_5

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

$$400000 = 400000 + 72727.2$$

$$BV_5 = 72727.2$$

$$\Rightarrow d6 = 400000 \left[\frac{2(10-6+1)}{10(11)}\right]$$

$$d6 = 36363.6$$

$$BV_6 =$$

$$400000 - \left[-2\left(\frac{400000}{10}\right) \times 6 + \left[\frac{400000}{110}\right] \times 6 \times 7\right.$$

$$400000 - 480000 + 152727$$

$$\Rightarrow 72727$$

$$\Rightarrow d7 = 400000 \left[\frac{2(10-7+1)}{10(11)}\right]$$

$$d7 = 29090.90$$

$$BV_7 = 400000 - \left\{2\left(\frac{400000}{10}\right) \times 7 + \left[\frac{400000}{110}\right] \times 7 \times 8\right.$$

$$400000 - 560000 + 203636.36$$

$$= 43636.36$$

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

$$d_8 = 400000\,(0.05454)$$

$$d_8 = 21818.18$$

$$BV_8 = 400000 - \left[2\left(\frac{400000}{10}\right)\right]\times 8 + \left[\frac{400000}{110}\right]\times 8\times 9$$

$$= 400000 - 640000 + 3636.36\times 72$$

$$BV_8 = 21818.18$$

$$d_9 = 400000\left[\frac{2(10-9+1)}{10(11)}\right]$$

$$d_9 = 14545.4$$

$$BV_9 = 400000 - \left[2\left[\frac{400000}{10}\right]\times 9 + \left[\frac{400000}{110}\right]\times 9\times 10\right.$$

$$= 400000 - 720000 + 327272.27$$

$$\boxed{BV_9 = 7272.9}$$

Q# 4 part (a)

Given :- Gross income and expenses as stated : income-tax rate = 40%.

Find: Net income.

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

(Note that our example explicitly assumes that the only depreciation charges for year one are those for the DC machine. a situation may not be typical.)

Item	Amount
Gross income (Revenues)	$50,000
Expenses	
Cost of Gold Sold	$20,000
Depreciation	$2000
Operating expenses	$6000
Taxable income	$20,000
Taxes (40%)	$8000
Net income	**$12,000**

Q # 04 part (b)

Benefits: Improvement of the image of the area of Abbotabad city.
-> Potential to attract conferences and conventions to Abbotabad city.
-> Potential to attract professional sports franchises to the city.
-> Revenues from rental of the facility.
-> Use of facility for civic events.

Costs: Architectural design of the facility, Construction of the facility, Design and construction of parking facility, Facility operating and maintenance costs, Insurance costs.

Disbenefits: Loss of use of portion of the park, bike path, natural trail, and the pond.
Loss of wildlife habitat in urban area.

Q#5 part (a)

Solution: First 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 costs.

Initial investment Cost
= $50,000 + $225,000
= $275,000.

Taxes and insurance per year.
= 0.1 ($275,000)
= $27,500.

Upkeep / year.
= $30 (12 x 30)(0.9)
= $9720.

CR cost / year
$275,000 (A/P, 12%, 20) - $50,000 (A/F, 12%, 20)
= $36,123.

(Assume that investment in land is recovered at the year of 20).

Equivalent AW (of costs) =
$\$275,000 - \$9720 - \$36123$

$= -\$73343$

Therefore minimum annual rental required equal $\$73343$ and with annual compounding, the monthly rental amount R is;

$R = \$73343 / (12 \times 30)(0.9)$

$= \boxed{\$226.36}$