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Engineering Management and Economics

Final paper

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Q1(a).Soln

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

$$P = 100000000 (1/1+0.08)^6$$

$$P = 158,609,000 \text{ Ans}$$

Q1(b).Soln

$$P = A[(1+i)^n - 1 / i(1+i)^n]$$

$$10 = (1.06)^n - 1 / 0.06 (1.06)^n$$

$$10 \times 0.06 (1.06)^n = (1.06)^n - 1$$

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

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

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

$$1/0.4 = (1.06)^n$$

$$2.5 = (1.06)^n$$

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

$$0.916 = n \times 0.0583$$

$$N = 0.916 / 0.0583$$

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

Q2(a)Soln

$$A = 30 \text{ Million}, N = 5 \text{ years}, i = 1.5\%$$

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

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

$$= 30000000 \left[\frac{1.0113}{0.3017} \right]$$

$$= 30000000 (3.5200)$$

$$= 105,600,000 \text{ Ans}$$

Q2(b)Soln

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

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

$$F = 10,000 \left[\frac{(1+0.05)^{15}}{0.05} - 1 \right]$$

$$= 10,000 [21.57]$$

$$= 215785.63 \text{ Ans}$$

Q3(a)Ans.

The decrease in the physical value of properties with the passage of time and use. A non-cash expense that reduces the value of an asset, as a result of wear and tear, age or obsolescence. Most assets lose their value over time (in other words, they depreciate), and must be replaced once the end of their useful life is reached. There are several accounting methods that are used in order to write off an asset's depreciation cost over the period of its useful life. Because it is a non-cash expense, depreciation lowers the company's reported earnings while increasing free cash flow.

Property is depreciable if it meets the following basic requirements:

- It must be used in business or help to produce income.
- It must have a useful life and the life must be longer than one year.
- It must be something that wears out, decays, gets used up, becomes obsolete, or loses value from natural causes.

Depreciable property is tangible or intangible. It includes two main types called personal property as real property personal property. Machinery, vehicles, equipment, furniture and similar items. Real property - land and anything erected on it, or attached to it - land itself is not depreciable because it does not have a determinable life. Intangible property - copyright patent or franchise.

Book-Value:

The worth of the depreciable property as shown on the accounting records of company. It is original cost basis of the property, including any adjustment less all ~~allowable~~ allowable depreciation or amount of capital remains invested in property and must be recovered in the future through accounting process.

Book value = adjusted cost basis

$$= \sum_{t=1}^n (\text{Depreciation deduction})$$

n is for no. of years.

Q3(b)

Sol-

Useful life = 10 years
 Cost = 400,000
 Salvage value = zero

Year	Depreciation Base	Remaining life
1	400,000	10
2	400,000	9
3	400,000	8
4	400,000	7
5	400,000	6
6	400,000	5
7	400,000	4
8	400,000	3
9	400,000	2
10	400,000	1

Fractions

$$\frac{10}{55} \times 400,000 = 72,727.27$$

$$\frac{9}{55} \times 400,000 = 65,454.54$$

$$\frac{8}{55} \times 400,000 = 58,181.81$$

$$\frac{7}{55} \times 400,000 = 50,909.09$$

$$\frac{6}{55} \times 400,000 = 43,636.36$$

$$\frac{5}{55} \times 400,000 = 36,363.63$$

$$\frac{4}{55} \times 400,000 = 29,090.90$$

$$\frac{3}{55} \times 400,000 = 21,818.18$$

$$\frac{2}{55} \times 400,000 = 14,545.45$$

$$\frac{1}{55} \times 400,000 = 7,272.72$$

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Ag #06

Book - Value

Year.

$$1 = 400,000 - 7,272.72 = 392,727.28$$

$$2 = 400,000 - 14,545.45 = 385,454.55$$

$$3 = 400,000 - 21,818.18 = 378,181.82$$

$$4 = 400,000 - 29,090.90 = 370,909.10$$

$$5 = 400,000 - 36,363.63 = 363,636.37$$

$$6 = 400,000 - 43,636.36 = 356,363.64$$

$$7 = 400,000 - 50,909.09 = 349,090.91$$

$$8 = 400,000 - 58,181.81 = 341,818.19$$

$$9 = 400,000 - 65,454.54 = 334,545.46$$

$$10 = 400,000 - 72,727.27 = 327,272.73$$

Q4(a)

Ans:

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 0 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 that may not be typical.

Item	Amount
Gross Income (Revenue)	\$, 50,000
Expenses	
Cost of goods sold	\$, 20,000
Depreciation	\$ 4,000
Operating expenses	\$ 6,000
Taxable income	\$ 20,000
Taxes (40%)	\$ 8,000
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	\$ 12,000

Q14 (b)

Benefits:-

Improvement of the image of Abatobod city.

Potential to attract conferences and conventions to Abatobod city. potential

Potential to attract professional sports franchises to the city

Revenues from rental of the facility uses 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.

Dis-Benefits:-

Loss of use portions of the facts Park bike path natural trail, and the band.

Loss of wild life habitat in urban area.

Q5

First to determine the equivalent of all costs at the MARR of 12% years to earn exactly 12%. The annual rental income adjustment for 90% occupancy, must equal the AW of costs.

initial investment cost.

$$= 5000 + 225,000 = 275,000.$$

Taxes & insurance cost.

$$= 0.1 (275,000) = 27,500.$$

$$\text{UPkeep / Year} = 30(12 \times 30) 0.9 = 9720.$$

$$\text{CR Cost / Year} = 275,000 (A/P) 12\%, 20)$$

$$50,000 (A/F) 12\% = 36,123.$$

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

$$= -275,000 - 9720 = -36,123$$

$$= 73,343.$$

The minimum amount rental received equal 73,343

& with amount compounding, the monthly rental amount R is

$$R = 73343 / (12 \times 30) (0.9) = 226.36.$$