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Id#11743

Engineering Management and Economics

Final paper

Q1 (a)Sol:

$$P = F \cdot (1+i)^n$$

$$P = 100000000 (1/2 + 0.08)^6$$

$$P = 158,600,000 \text{ Ans}$$

Q2 (b)

$$\text{Sol: } P = A[(1+i)^n - 1/i(1+i)^n]$$

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

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

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

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

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

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

$$2.5 = (1.06)^n$$

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

$$0.916 = n \times 0.0583$$

$$N = 0.916/0.0583$$

$$N = 15.7 \text{ Years Ans}$$

Q2(a)Sol. $A = 30 \text{ million}, N = 5 \text{ years}, i = 1.5\%$

$$\begin{aligned}
 P &= A \left[\frac{(1+i)^n}{i(1+i)^n} - 1 \right] \\
 &= 30000000 \left[\frac{(1+0.015)^5}{0.015(1+0.015)^5} - 1 \right] \\
 &= 30000000 \left[\frac{1.0113}{0.017} \right] \\
 &= 30000000 (3.5200) \\
 &= 105,600,000 \text{ Ans.}
 \end{aligned}$$

Q2(b)Sol. $A = 10,000, i = 5\%, N = 15$

$$\begin{aligned}
 F &= A \left[\frac{(1+i)^n}{i} - 1 \right] \\
 &= 10,000 \left[\frac{(1+0.05)^{15}}{0.05} - 1 \right] \\
 &= 10,000 [21.57] \\
 &= 215785.63 \text{ Ans}
 \end{aligned}$$

Q2(a)

Ans Depreciation is the decrease in value of physical assets with the passage of time & ~~use~~ 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~~ 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 held to produce income.
 - It must have a useful life & 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 as *untangibile*. It includes two main types called personal property or real property. Machinery, vehicles, equipment, furniture & similar items are real property - land & anything erected on it, or attached.

(4)

So it does not have a depreciable because it does not have a determinable life.

Intangible property - copyright, patent.

Book value

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

$K = \text{adjusted cost basis}$

$\sum_{i=1}^{15} (\text{Depreciation } K \text{ is } 70 \text{ no of years.})$

Q3(b)

Ans Useful life = 10 years.

Cost = 400,000

~~Salvage~~ salvage value = zero.

<u>Year</u>	<u>Depreciation Base</u>	<u>Remaining life</u>
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

P.T-O.

Fraction

Answers: 11743

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

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

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

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

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

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

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

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

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

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

Bank Value

1	= 400,000 - 7272.72	392,727.28
2	= 400,000 - 14,545.45	385,454.55
3	= -21,818.18 + 400,000	378,181.82
4	= 400,000 - 29,090.90	370,909.10
5	= -36,363.63 + 400,000	363,636.37
6	= -43,636.36 + 400,000	356,363.64
7	= -50,909.09 + 400,000	349,090.91
8	= -58,181.81 + 400,000	341,818.19
9	= -65,454.54 + 400,000	334,545.46
10	= -72,727.27 + 400,000	327,272.73

Q4 (a) Given Gross income & expense
 as started; income - rate = 40%
 Find net income.

Consider the purchase of the ~~new~~ machine to have been made at the end of year one 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.

<u>Item</u>	<u>Amount</u>
<u>Gross income</u>	<u>\$ 50,000</u>
<u>Expenses</u>	<u>\$ 20,000</u>
<u>Cost of goods sold</u>	<u>\$ 1,400</u>
<u>Depreciation expenses</u>	<u>\$ 6,000</u>
<u>Operating expenses</u>	<u>\$ 20,000</u>
<u>Taxable income</u>	<u>\$ 20,000</u>
<u>Taxes (40%)</u>	<u>\$ 12,000</u>

Q4 (b) Benefit Benefits

Improvement of the image of
 Abbotabad city.
 Potential conventions to attract conferences &
 to Abbotabad city.
 P-T-0.

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⑦

Revenues from rental of the facility uses of facility for civic events.

Costs: Architectural design of the facility, construction of the facility design & construction of parking facility, facility operating & maintenance costs, insurance costs.

Disbenefits: Loss of use ~~part~~ position of the park bike path natural trail & the food. Loss of wildlife habitat ~~in~~ in urban area.

Q5

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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

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