GATE PSUs
State Engg. Exams

MADE EASY Workbook 2025

Detailed Explanations of Try Yourself *Questions*

Chemical Engineering

Plant Design and Economics

MADE EASY PUBLICATIONS

2 Depreciation

Detailed Explanation of Try Yourself Questions

T1 : Solution

(10 lakh)

Declining balance method provides greater depreciation allowance in early lite of property, than in the latter life, therefore declining method should be choosed.

$$d = \frac{50-2}{8} = 6$$

$$V_a = 50 - 4 \times 6 = 26 \text{ lakh}$$

Declining method:

$$f = 1-\left[\frac{2}{50}\right]^{118} = 0.3313$$

$$V_a = 50[1-0.3313]4$$

$$V_a = 10 \text{ lakh}$$

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3 Calculation of Interest

Detailed Explanation of Try Yourself Questions

T1 : Solution

Two effect evaporator is to be choosed.

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4 Capitalized Cost and Annualized Cost

Detailed Explanation of Try Yourself Questions

T1 : Solution

(a)

Convert Machine-1 cash flow into annuity.

$$\text{Annuity} = -20000\,(A/P, 10\%, 3) - 9000 + 4000\,(A/F, 10\%, 3)$$

$$= \frac{-20000 \times 0.1 \times (1.1)^3}{(1.1)^3 - 1} - 9000 + \frac{4000 \times 0.1}{(1.1)^3 - 1}$$

$$= \$ -15834$$

$$\text{Capitalized cost} = \frac{\text{Annuity}}{i}$$

$$= \frac{\$(-15834)}{0.1} = (\$ - 158340)$$

For Machine-2:

For $n \to \infty$ then find out present worth.

$$\text{Capitalized cost} = -100000 - \frac{7000}{0.1}$$

$$= \$\,(-170000)$$

So Machine-1 is more economical than Machine-2.

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5 Break Even Analysis

Detailed Explanation of Try Yourself Questions

T1 : Solution

(b)

$$\text{Break even point} = \frac{\text{Fixed expenses}}{\text{Contribution per unit}}$$

$$6000 = \frac{54000}{\text{Selling price} - \text{Variable cost price}}$$

$$\text{S.P.} - \text{V.C.} = \frac{54000}{6000} = 9$$

$$\text{Selling price} = 9 + \text{variable cost price}$$

$$\text{S.P.} = 9 + 165 = ₹\ 24$$

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7 Profability Analysis

Detailed Explanation of Try Yourself Questions

T1 : Solution

Yes it is recommended to implement the project.

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8 Design of Pressure Vessels

Detailed Explanation of Try Yourself Questions

T1 : Solution

(a, b)

Where, ρ = Design pressure

d = Diameter

t = Thickness of vessel

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