Table

Description automatically generated

 Benefit Cost Ratio = PWV of Annual Benefits / (PWV of Annual Support service + cost)

PWV Annual Benefits = Value/(1+i)noy + Value/(1+i)noy 1….  
PWV of Annual Support Service = Price to Develop + PWV of Annual Support Service

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Table

Description automatically generated

(a) Benefit/Cost Analysis

**Design A:**

NPW of investment, I = $400,000

NPW of costs, C' = $50,000 (P/A, 8%, 15) = $427,975

NPW of benefits, B = $85,000 (P/A, 8%, 15) = $727557.5

**Design** **B**:

NPW of investment, I = $300,000

NPW of costs, C' = $80,000 (P/A, 8%, 15) = $684,760

NPW of benefits, B = $85,000 (P/A, 8%, 15) = $727557.5

Modified B/C = (BA - BB - (C'A- C'B) ) / (IA - IB)= (0 - (427,975 - 684,760))/(400,000-300,000) = 2.57

**Select Design A as this value is >1.**

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Table

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Incremental B/C ratio (A3 - A1) = (500-400)/((200-100) + (150-100))

Incremental B/C ratio (A3 - A1) = .67

Since value of Incremental B/C ratio (A3 - A1) is less than 1, then A3 is rejected and A1 is selected.

Now, A1 is compared with A2.

Incremental B/C ratio (A2 - A1) = (700-400)/((300-100) + (200-100))

Incremental B/C ratio (A2 - A1) = 1

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Graphical user interface

Description automatically generated

**BC(i) = PWoB/PWoC**

Graphical user interface, table

Description automatically generated

PW = 500000/(1.05)^1 + 370000/(1.05)^2…….

Profitability Index = PW(A) / Investment Required(A) = 1537793.67 / 1100000 = 1.40

Incremental PI Ratio = PI(A) - PI(B)

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**To automate one of its production processes, Milwaukee Corporation bought three**

**flexible manufacturing cells at a price of $500,000 each. When they were delivered,**

**Milwaukee paid freight charges of $25,000 and handling fees of $12,000.**

**Site preparation for these cells costs $35,000. Six foremen, each earning $15 an hour,**

**each worked five-40 hour weeks to set up and test the manufacturing cells.**

**Special wiring and other materials applicable to the new manufacturing cells cost $1500.**

**Determine the cost basis (amount to be capitalized) for the three flexible manufacturing cells.**

**Note: A cash flow diagram is not required.**

* Cost price of three cells = 3\*500,000 = $1,500,000
* Handling fees, freight charges site preparation charges and wiring and other materials cost = 12,000 + 25,000 + 35,000 + $1,500= $ 73,500
* Wages of one foreman = wage per hour \* weeks worked \* hours per week = 15\*5\*40 = $3,000

Wages of 6 foremen = 6\*3,000 = $18,000

* Cost basis for three cells = $1,500,000 + $ 73,500 + $18,000 = $1,591,500

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Graphical user interface, table

Description automatically generated

*Cost of the asset = 224,000*

*Salvage Value = 53,000*

*Life = 5 years*

**a.** Depreciation according to **straight line** balancing method.

Depreciation = (I – S) ÷ N

Depreciation = (224,000 – 53,000) ÷ 5 = 34,200

Depreciation Rate = 34,200 ÷ (224,000 – 53,000) \* 100 = 20%

Bn = Cost-n(SL Dep) = 224,000 - 1yr(34,200)

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**(b)**Depreciation according to **double declining** balancing method.

Depreciation according to double declining method = 2\*Straight line balancing method

Rate = 2\*20% = 40%

Dn = Cost \* Rate = 224000\*0.4 (Dn2 = Dn1 - (Dn1\*0.4))

Bn = Cost-n(SL Dep) = 224,000 - 1yr(34,200)

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A screenshot of a computer

Description automatically generated with medium confidence

Graphical user interface, text, application

Description automatically generated

Graphical user interface, text, application

Description automatically generated

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**The Vermont Construction Company purchased a truck on January 1, 2009 at a cost of $35000.**

**The truck has a useful life of eight years with an estimated salvage value of $6000.**

**The straight-line method is used for book purposes, for tax purposes the track**

**would be depreciated with the MACRS method over its five-year useful life.**

**Determine the depreciation amount to be taken over the useful life of the having truck for both and tax purposes.**

* Annual Deprecation (SL Deprecation) = (Cost - SV)/years == (35000-6000)/8
* MACRS = Initial Cost \* MACRS %n

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Graphical user interface, text, application

Description automatically generated

Gain or Loss = SV - ( InitialPurchase - (InitialPurchase(%yr1, %yr2, %yrn/2))

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