

Salvage value for the machine engineering essay

[Engineering](#)



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SET A

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Machine cost = 700, 000+ 80, 000+20, 000 = 800, 000

Calculations for depreciation both Machines:**Items****Yr 1****Yr 2****Yr 3****Yr 4**

Old Machine Book Value (beginning of

Yr)80000600004000020000Depreciation20000200002000020000Book Value

(end of Yr)6000040000200000New Machine Book Value (beginning of

Yr)800000560000392000274400Depreciation24000016800011760082320B

ook Value (end of Yr)560000392000274400192080

Incremental Depreciation2200001480009760062320Total capital

expenditure in first year = 696, 000Salvage value for the machine = 50000

+ (192080-50000)*(0. 4) = 106832

Cash flow table

Items

Yr 0

Yr 1

Yr 2

Yr 3

Yr 4

Operating Expenses

290000290000290000290000Operating Incomes

290000290000290000290000Less Depreciation

2200001480009760062320EBIT

70000142000192400227680Subtract Tax (@40%)

28000568007696091072Net Income

4200085200115440136608Add Back Depreciation

2200001480009760062320Subtract Replacement Cost696, 000

Add Tax Adjusted Salvage Of New Machine

106832Cash Flows-696, 000262, 000233, 200213, 040305, 760

Calculations for Internal Rate of Return:

Average Cash Flow per Year: $(262000+233200+213200+213040+305760)/4$

= 253500 Estimate of payback period: $696000/253500 = 2.7456$ From

present factor annuity tables, 2.7456 for a period of 4 years corresponds to

a rate of 18% NPV (@18%) = $-696,000 + 262,000 \cdot 0.847 + 233,200 \cdot 0.718$

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$+ 213,040 \times 0.609 + 305,760 \times 0.516 = -19135$
 $NPV (@17\%) = -696,000 + 262,000 \times 0.855 + 233,200 \times 0.731 + 213,040 \times 0.624 + 305,760 \times 0.534 = -$
 5308
 $NPV (16\%) = -696,000 + 262,000 \times 0.862 + 233,200 \times 0.743 + 213,$
 $040 \times 0.641 + 305,760 \times 0.552 = 8450$
 $IRR = 16 + \{(17-16)/(-5308-8450)\} \times (0-8450) = 16.61\%$
 The IRR is approximately equal to 16.61%
 At 10% rate: Thus $NPV = -696,000 + 262,000 \times 0.9091 + 233,200 \times 0.8264 +$
 $213,040 \times 0.7513 + 305,760 \times 0.6830 = 103792$
 Company can replace old m/c with the new as $NPV > 0$ & $IRR >$ hurdle rate
 Solution 2: New machine cost: $475000 + 5000 = 480,000$

Depreciation :

Items

Yr 1

Yr 2

Yr 3

Yr 4

New Machine Book Value (beginning of

Yr) 480000 336000 235200 164640 Depreciation 144000 100800 70560 49392 Bo

ok Value (end of Yr) 336000 235200 164640 115248 Replacement Cost: 480,

000-100,000 = 380,000 Salvage Value for New Machine : 115248- (120000-

115248)*(0.34) = 113632

Annual Net Incremental Cash Flows:**Items****Yr 0****Yr 1****Yr 2****Yr 3****Yr 4**

Total Savings

110000110000110000110000Operating Income

110000110000110000110000Less Depreciation

1440001008007056049392EBIT

-3400092003944060608Less Tax (@34%)

-11560312813409. 620606. 72Net Income

-22440607226030. 440001. 28Add Back Depreciation

1440001008007056049392Less Replacement Cost380, 000

Add Tax Adjusted Salvage Of New Machine

113632Cash Flows-380, 000121, 560106, 87296, 590203, 025

Calculations for Internal Rate of Return:Average Cash Flow: $(121, 560 + 106, 872 + 96, 590 + 203, 025)/4 =$ 132012payback period: $380000/132012 = 2. 87852. 8785$ for a period of 4years = 14%NPV (@14%) = $-380, 000 + 121, 560*0. 877 + 106, 872*0. 769$ + $96, 590*0. 675 + 203, 025*0. 592 = -5818$ NPV (@13%) = $-380, 000 + 121,$ <https://assignbuster.com/salvage-value-for-the-machine-engineering-essay/>

$$560 \times 0.885 + 106,872 \times 0.783 + 96,590 \times 0.693 + 203,025 \times 0.613 =$$

$$2653 \text{ IRR} = 13 + \{(14-13)/(-5818-2653)\} \times (0-2653) = 13.31\% \text{ At 10\% hurdle:}$$

$$\text{NPV} = -380,000 + 121,560 \times 0.9091 + 106,872 \times 0.8264 + 96,590 \times 0.7513 \\ + 203,025 \times 0.6830$$

$$= \mathbf{30063}$$

IRR > hurdle rate and NPV > 0 Thus Adam smith can automate Solution 3:

New Machine cost: 25,000 + 2,000 = 27,000

Calculations for depreciation new Machines::

Items

Yr 1

Yr 2

Yr 3

Yr 4

Yr 5

New Machine Book Value (beginning of

yr) 27000 16200 9720 5832 3499 Depreciation 10800 6480 3888 2331 1400 Book

Value (end of Yr) 16200 9720 5832 3499 2100 Replacement Cost: 27,000 - 6,

000 = 21,000 Salvage Value: 5000 - (5000-2100)*(0.35) = 3985

Annual Net Incremental Cash Flows:**Items****Yr 0****Yr 1****Yr 2****Yr 3****Yr 4****Yr 5**

Total Savings

75007500750075007500Technical Support Expense

750750750750750Operating Income

67506750675067506750Less Depreciation

108006480388823331400EBIT

-4050270286244175350Less Tax (@35%)

-141895100215461873Net Income

-2633176186028713478Add Back Depreciation

108006480388823331400Less Replacement Cost21000

Less Increase In WC1000

Add Release of WC

1000Add Tax Adjusted Salvage Of New Machine

3985Cash Flows-220008168665657485204886210% NPV = -22000 +
 8168*0. 9091 + 6656*0. 8264 + 5748*0. 7513 + 5204*0. 6830 + 8862*0.
 621 = 4302

Calculations for Internal Rate of Return:

Average Cash $(8168 + 6656 + 5748 + 5204 + 8862)/5 = 6928$ payback
 period: $22000/6928 = 3.17553$. 1755 for a period of 5 years = 17% NPV
 (@17%) = $-22000 + 8168*0.855 + 6656*0.731 + 5748*0.624 + 5204*0.$
 $534 + 8862*0.456 = 256$ NPV (@18%) = $-22000 + 8168*0.847 + 6656*0.$
 $718 + 5748*0.609 + 5204*0.516 + 8862*0.437 = -244$ IRR = $17 + \{(18-17)/$
 $(-244-256)\}*(0-256) = 17.51\%$ The IRR is approximately equal to 17.51% IRR
 > hurdle rate and NPV > 0. It is advised to buy new machine Solution 4:

Calculations for depreciation Machines:

Items

Yr 1

Yr 2

Yr 3

Yr 4

Yr 5

Yr 6

Yr 7

New Machine Book Value (beginning of

yr) 1500000975000633750411938267759174044113128 Depreciation 525000

341250221813144178937166091539595 Book Value (end of

yr)97500063375041193826775917404411312873533Salvage Value of New
Machine: $400,000 - (400,000 - 73,533) \times (0.4) = 269,413$

Annual Net Incremental Cash Flows:

Items

Yr 0

Yr 1

Yr 2

Yr 3

Yr 4

Yr 5

Yr 6

Yr 7

Sales

500000500000500000500000500000500000500000500000Cost of production

300000300000300000300000300000300000300000300000Operating Income

200000200000200000200000200000200000200000200000Less Depreciation

525000341250221813144178937166091539595EBIT

-325000-141250-2181355822106284139085160405Less Tax (@40%)

-130000-56500-872522329425145563464162Net Income

-195000-84750-1308833493637718345196243Add Back Depreciation

525000341250221813144178937166091539595Equipment Cost1500000

Salvage Of New Machine

269, 413Cash Flows-

1500000330000256500208725177671157486144366405251NPV = -1, 500, 000 + 330, 000*0. 9091 + 256, 500*0. 8264 + 208, 725*0. 7513 + 177, 671*0. 6830 + 157, 486*0. 621 + 144, 366*0. 564 + 405, 251*0. 513= -322, 746

Internal Rate of Return:

Average Cash Flow per Year: $(330, 000 + 256, 500 + 208, 725 + 177, 671 + 157, 486 + 144, 366 + 405, 251)/7 = 240, 000$ payback period: $1, 500, 000/240, 000 = 6. 256. 25$ for a period of 7 years corresponds to a rate of 2%
 NPV (@2%) = $-1, 500, 000 + 330, 000*0. 980 + 256, 500*0. 961 + 208, 725*0. 942 + 177, 671*0. 924 + 157, 486*0. 906 + 144, 366*0. 888 + 405, 251*0. 871 = 54, 256$
 NPV (@3%) = $-1, 500, 000 + 330, 000*0. 971 + 256, 500*0. 943 + 208, 725*0. 915 + 177, 671*0. 888 + 157, 486*0. 863 + 144, 366*0. 837 + 405, 251*0. 813 = -2721$
 IRR = $2 + \{(3-2)/ (-2721-54256)\}*(0-54265) = 2. 95\%$ The IRR is approximately equal to 2. 9

Thus we should not go ahead with the project as NPV is negative