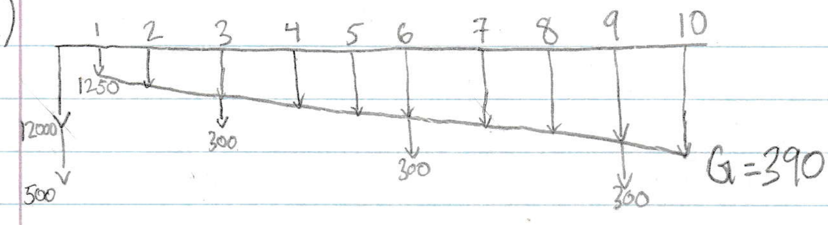
15tjh2
20000838

2)



$d = 20\%$

MARR $= 2.5\%$

$\underline{S(n) = 12000(1-d)^n}$

$EAC = EAC_{cap} + EAC_{O\&M}$ $EAC_{cap} = [P + I - S(n)](\frac{A}{P}, i, n) + S(n)i$

Year 1

$S(1) = 12000(1-0.2)^1 = 9600.00$

$EAC = [12500 - 9600](1.0250) + 9600(0.025) + 1250$

$= \$4462.50$

Year 2

$S(2) = 12000(1-0.2)^2 = 7680.00$

$EAC = [P + I - S(n)](\frac{A}{P}, 2.5\%, 2) + S(n)i + O\&M_A + O\&M_G(\frac{A}{G}, 2.5\%, 2)$

$= [12500 - 7680](0.5188) + 7680(0.025) + 1250 + 390(0.4938)$

$= \$4135.20$

Year 3

$S(3) = 12000(1-0.2)^3 = 6144.00$

$EAC = EAC_{cap} + O\&M_A + O\&M_G(\frac{A}{G}, 2.5\%, 3) + O\&M_P(\frac{A}{F}, 2.5\%, 3)$

$= [12500 - 6144](0.3501) + 6144(0.025) + 1250 + 390(0.9835) + 300(0.3251)$

$= \$4109.93$

Year 4

$S(4) = 12000(1-0.2)^4 = 4915.20$

$EAC = EAC_{cap} + O\&M_A + O\&M_G(\frac{A}{G}, 2.5\%, 4) + O\&M_P(\frac{P}{F}, 2.5\%, 3)(\frac{A}{P}, 2.5\%, 4)$

$= [12500 - 4915.2](0.2658) + 4915.2(0.025) + 1250 + 390(1.4691) + 300(0.9286)(0.2658)$

$\$4035.92$

Year 5

$S(5) = 12000(1-0.2)^5 = 3932.16$

$EAC = EAC_{cap} + O\&M_A + O\&M_G(\frac{A}{G}, 2.5\%, 5) + O\&M_P(\frac{P}{F}, 2.5\%, 3)(\frac{A}{P}, 2.5\%, 5)$

$= [12500 - 3932.16] + 3932.16(0.025) + 1250 + 390(1.9506) + 300(0.9286)(0.2152)$

$= \$4612.79$

Year 6

$S(6) = 12000(1-0.2)^6 = 3145.728$

$$EAC = EAC_{cap} + O\&M_A + O\&M_G(A/G, 2.5\%, 6) + O\&M_{P1}(P/F, 2.5\%, 3)(A/P, 2.5\%, 6) + O\&M_{P2}(A/F, 2.5\%, 6)$$

$$= [12500 - 3145.728](0.1815) + 3145.728(0.025) + 1250 + 390(2.4280) + 300[0.9286(0.1815) + 0.1565)$$

$$= \$4070.88$$

EAC Year 4 > EAC Year 5 and EAC Year 6 > EAC Year 5

$\therefore$ $\boxed{EAC_{min} = \$4012.79}$ and the machine should be replaced after 5 years