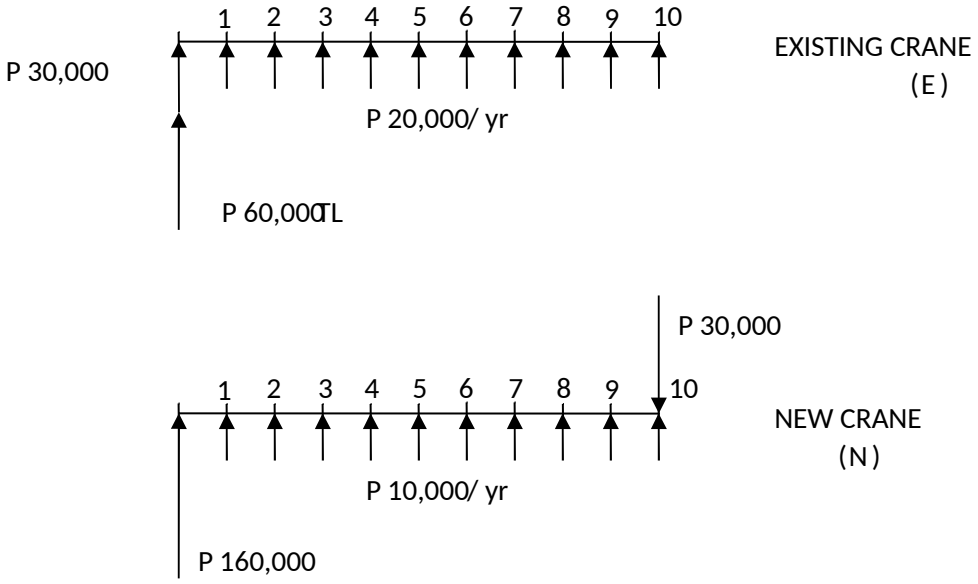
PROBLEM

The ABC company has a tower crane that has an estimated remaining life of 10 years. The crane can be sold for P60,000. If the crane is kept in service it must have a major repair immediately at a cost of P30,000. Operating and maintenance costs will be P 20,000 /yr after the crane is repaired. After being repaired, the crane will have a zero-salvage value at the end of the 10-year period.

A new crane will cost P160,000 will last for 10 years, and will have P30,000 salvage value at that time. Operating and maintenance costs are P10,000 /yr for the new crane.

The company uses a MARR of 10% in evaluating investment alternatives. Should the company buy the new crane? Compare the annual equivalents.



Existing Crane (E):

- Initial Cost – P60,000 + P 30,000= P 90,000
- Annual operating cost – P20,000
- Service life – 10 years
- Salvage value – 0

New Machine (N):

- Initial cost – P160,000
- Annual operating cost – P10,000

- Service life – 10 years
- Salvage value – P 30,000

Solution:

$$AEC = A_o + C_o\left(\frac{(1+i)^n(i)}{(1+i)^n-1}\right) - C_L\left(\frac{i}{(1+i)^n-1}\right)$$

For Existing Crane (E):

$$AEC_E = 20{,}000 + 90{,}000\left(\frac{(1.1)^{10}(0.1)}{(1.1)^{10}-1}\right) - \left(\frac{0.1}{(1.1)^{10}-1}\right)$$

$$AEC_A = P\,34{,}647.02$$

For New Machine (N):

$$AEC_N = 10{,}000 + 160{,}000\left(\frac{(1.1)^{10}(0.1)}{(1.1)^{10}-1}\right) - 30{,}000\left(\frac{0.1}{(1.1)^{10}-1}\right)$$

$$AEC_N = P\,34{,}156.90$$

$$AEC_E > AEC_N$$

$\because$ **Since** AEC_N **has a lower value, we should choose to buy a new machine**