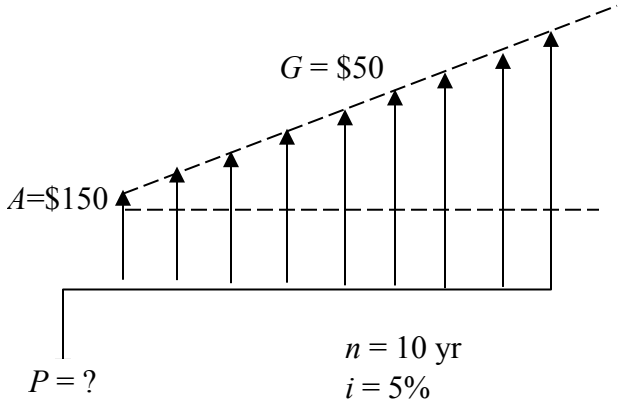
TOPIC
Economics – Section VI – Question 4

QUESTION
My son bought a used car and wants to set aside money for maintenance costs. The maintenance cost is projected to be $150 in the first year with an annual increase of $50 each year after the first year. Assuming an interest rate of 5 percent, the money he must set aside now to keep the car running for 10 years most nearly is

(A) $650
(B) $2650
(C) $2741
(D) $3700

HINT
This problem is solved by resolving the cash flow into two components, the portion corresponding to a uniform cash flow of $150 per year plus the portion corresponding to the gradient of $50 per year.

SOLUTION


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$$P = P_1 + P_2$$

$$P_1 = A(P/A, i, n)$$
$$= A\left[\frac{(1+i)^n - 1}{i(1+i)^n}\right]$$

$$= 150\left[\frac{(1+0.05)^{10}-1}{0.05(1+0.05)^{10}}\right]$$
$$= 150 \times 7.722$$
$$= \$1158.30$$
$$P_2 = G(P/G, i, n)$$
$$= G\left[\frac{(1+i)^n - in - 1}{i^2(1+i)^n}\right]$$
$$= 50\left[\frac{(1+0.05)^{10} - 0.05 \times 10 - 1}{0.05^2(1+0.05)^{10}}\right]$$
$$= 50 \times 31.652$$
$$= \$1582.60$$
$$P = P_1 + P_2$$
$$= \$1158.30 + 1582.60$$
$$= \$2740.90$$
$$= \$2741$$

ANSWER

(C)

CONTRIBUTOR

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