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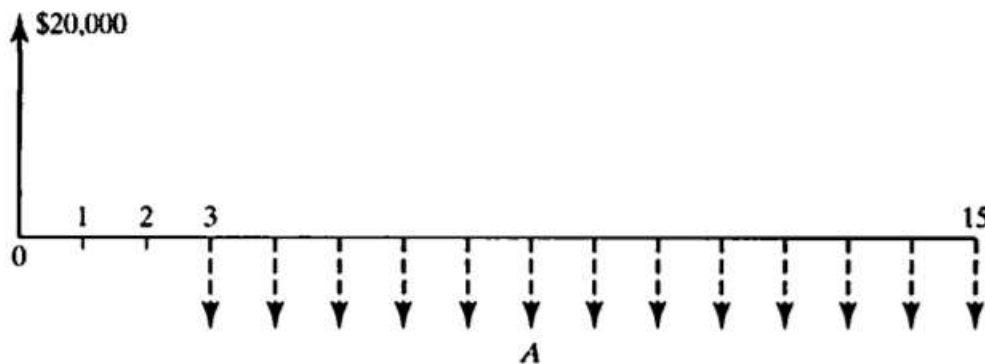
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ISE 307, Term 173
ENGINEERING ECONOMIC ANALYSIS

Quiz# 1 Solution

Date: Sunday, July 1, 2018

Q1. If you borrow \$20,000 at an interest rate of 8%, compounded annually with the following repayment schedule, what is the required amount A?



- (a) A = \$2,951
- (b) A = \$3,967
- (c) A = \$3,101
- (d) A = \$2,324

$$20,000(F/P, 8\%, 2) = A (P/A, 8\%, 13)$$

$$20,000 * 1.1664 = A * 7.9038$$

$$\Rightarrow A = 20,000 * 1.1664 / 7.9038 = \$2,951.49$$

Q2. What is the amount of 10 equal annual deposits that can provide five annual withdrawals, when a first withdrawal of \$2,000 is made at the end of year 11 and subsequent withdrawals increase at the rate of 5% per year over the previous year's rate if the interest rate is 7% compounded annually?

$$F = A(F / A, i\%, N) = P = \frac{A_1 \left[1 - (1+i)^{-N_1} (1+g)^{N_1} \right]}{i - g}$$

$$A(F / A, 7\%, 10) = \frac{2000 \left[1 - (1+0.07)^{-5} (1+0.05)^5 \right]}{0.07 - 0.05}$$

$$A = \frac{2000 \left[1 - (1+0.07)^{-5} (1+0.05)^5 \right]}{(0.07 - 0.05) \times 13.8164}$$

$$= 651.61$$