BUILDING ECONOMY

Building Economy
Concepts of Building Economic Analysis

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<u>Engineering Economy</u> **is a collection of mathematical techniques which simplify economic comparisons.**

<u>Time Value of Money</u> **means that money has a greater value tomorrow than it has today.**

<u>Interest</u> **is a measure of the increase between the original sum borrowed or invested and the final amount owed or accrued. It is the growth in value with time.**

Interest = Total amount accumulated – Original investment

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On the other hand, if you had borrowed money from the bank at some time in the past:

Interest = Present amount owed – Original loan

In either case, there is an increase in the amount of money that was originally invested or borrowed, and the increase over the original amount is the interest.

The original investment or loan is referred to as <u>Principal</u>.

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Interest Calculations   1/2

When interest is expressed as a percentage of the original amount per unit time, the result is what is called an interest rate.

$$\text{Percent interest rate} = \frac{\text{Interest accrued per unit of time}}{\text{Original amount}} \times 100\%$$

The most common period or unit of time is one year.

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Interest Calculations   **2/2**

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Example: Suppose you invested $100,000 on May 1, and withdraw a total of $106,000 exactly one year later. Compute

      A. Interest
      B. Interest rate.

Interest = $106,000 - $100,000 = $6,000

$$\text{Percent interest rate} = \frac{\$6,000 \text{ per year}}{\$100,000} \times 100\%$$

Percent interest rate = 6% per year

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Equivalence

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Different sums of money at different times can be equal in economic value.

For example, if the interest rate is 6% per year, a $100 today (present time) would be equivalent to $106 one year from today.

Also, $100 today is equivalent to $94.34 one year ago.

Therefore, $94.34 last year, $100 now, and $106 one year from now are equivalent when the interest rate is 6% per year.

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Rate of Return

The rate of return is used when determining the profitability of a proposed investment or past investment.

$$\text{Rate of return (RR)} = \frac{\text{Total amount of money received} - \text{Original investment}}{\text{Original investment}} \times 100\%$$

$$\text{Rate of return (RR)} = \frac{\text{Profit}}{\text{Original investment}} \times 100\%$$

Interest rate is used when borrowing capital or when a fixed rate has been established.

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