1. (a)	Explain problem solving iteration with a sketch

PROBLEM SOLVING AND DECISION MAKING

The fundamental approach to solve problems in economics is through scientific methods. But scientific methods use both theoretical and practical knowledge to solve the same. In other words, it takes both the real world of facts and figures and the symbolic world of theories and hypothesis to solve problems, through an iterative process. The following steps gives a general problem - solving process involving both words.

(i) Problems in engineering and managerial economy originate in the real world of economic planning, management and control.

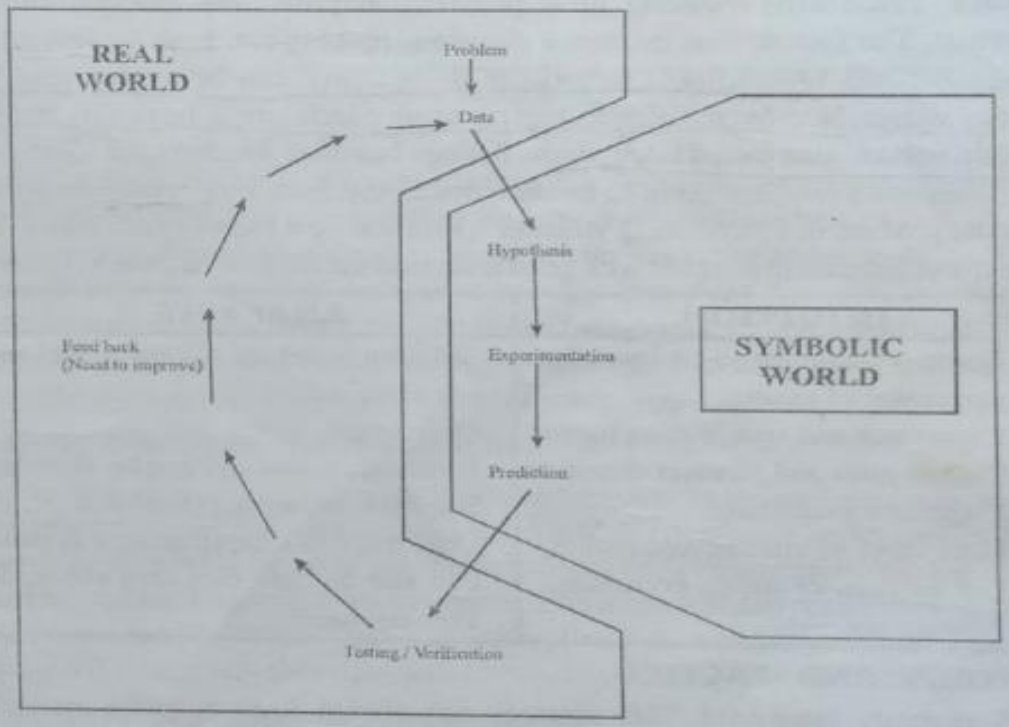


Fig. 1.1 Problem solving iteration

(ii) The problem is defined and clarified by data from the real world.

(iii) This information is subjected to analysis based on scientific principles to formulate a hypothesis in symbolic terms. This is like postulation of a theory or deriving a formula from fundamental principles.

(iv) By manipulating and experimenting, an analyst can simulate and project reality in multiple configurations so as to understand all outcomes. Imagine a CAD software which can alter product design in many ways.

(v) From these activities, usually a prediction (or a forecast) emerges. This can be considered a possible solution to the decision problem.

(vi) This prediction is subjected to verification in the real world for its practical usage. If it gives desired results, then the problem is solved.

(vii) If not, the cycle is repeated with valuable feedback from previous approac adding to data.

(b) If the annual ,maintenance and operating costs of a dam are expected to be Rs 4,00,000 for the first year and increasing at a rate of 10% per year ,determine the present value of all operating costs spent over a 30 years life .assume rate of interest as 12 %. If the rate of increase per year would be 12% instead of 10%,what is the difference would it make to the answer

Solution:

Given,

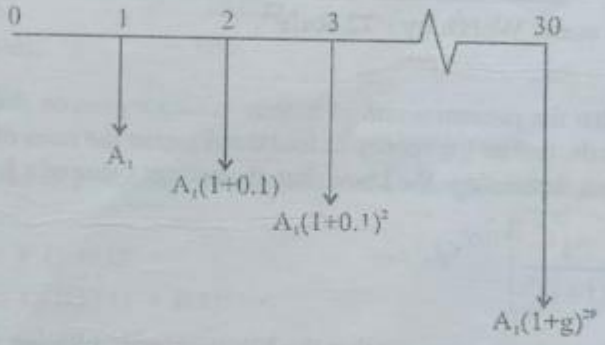
$A_1 = 4,00,000$

$g = 10\%$

$i = 12\%$

$n = 30$ years

The CFD for the above problem would be



We have, $P_g = \frac{A_1}{1+g}\left[\frac{(1+g^1)^n - 1}{g^1(1+g^1)^n}\right]$

When $g^1 = \frac{1+i}{1+g} - 1$

$g^1 = \frac{1+0.12}{1+0.1} - 1$

$g^1 = 0.01818$

$\therefore P_g = \frac{4,00,000}{(1+0.1)}\left[\frac{(1+0.01818)^{30} - 1}{0.01818(1+0.01818)^{30}}\right]$

$\therefore P_g = Rs.83,51,505$

This is the present amount for the geometric series.

If $i = g = 0.12$, then

we have $P_g = A_1\left[\frac{n}{1+g}\right]$

$= 4,00,000\left[\frac{30}{1+0.12}\right]$

$\therefore P_g = Rs.107,14,285.$

2. (a)	A film star is at the height of his career .he wants to invest Rs 10 lakhs from the end of this year and follow it up with 9 lakhs ,8 lakhs and so on for the next 5 years ,when his income would go on diminishing .find the maturity amount 6 years later if a film producer agrees to pay him 15%rate of interest,compounded annually

Solution:

Given : A1 = Rs. 10,00,000/-

G = Rs. 1,00,000/-

i = 15%

n = 6 years

A = ?

F = ?

$$A = A1 - G\left[\frac{(1+i)^n - in - 1}{i(1+i)^n - i}\right]$$

Note : –ve sign is used because of diminishing installments

$$A = 1000000 - 100000\left[\frac{(1+0.15)^6 - (0.15\times 6) - 1}{0.15(1+0.15)^6 - 0.15}\right]$$

$$A = 1000000 - 100000\ [2.097]$$

$$A = \text{Rs.}7,90,280$$

This is the annual equivalent amount for the series of payments spread over six years.

$$\text{Maturity amount, } F = A\left[\frac{(1+i)^n - 1}{i}\right]$$

$$F = 790280\left[\frac{(1+0.15)^5 - 1}{0.15}\right]$$

$$F = \text{Rs.}53,28,369.$$

(b) | Explain factors influencing demand and supply

Factors influencing demand or demand determinants

Various factors influence the market demand for a product. The knowledge of thes factors and the nature of relationship between the demand and its determinants is ver helpful in analyzing and estimating demand for the products.

1. Price of the product.
2. Price of related goods-substitutes, supplements, accessories.
3. Level of consumer income.
4. Continuous change in consumers taste and preference.
5. Advertisement / Publicity / Product promotion schemes given to the product.
6. Credit facility to consumers.
7. Population of the country.
8. Ease of availability.
9. Climatic and demographic condition.
10. General economic climate in the country as well as distribution pattern of nationa income.

Factors influencing supply or supply determinants

Factors that influence supply are somewhat similar to demand determinants, with some exceptions. Some of them are :

(i) Price of the product.

(ii) Availability and prices of raw materials that go into production.

(iii) Production technology.

(iv) Company's expectation about future prospects for prices, costs, sales and the state of the economy in general.

(v) Goals, objectives and policies of the company.

(vi) Weather, strikes and other forces which affect production and distribution.

(vii) Number of competitive firms in the industry.

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2. **A film star is at the height of his career. He wants to invest Rs. 10 Lakhs from the end of this year and follow it up with 9 Lakhs, 8 Lakhs and so on for the next five years, when his income would go on diminishing. Find the maturity amount 6 years later if a film producer agrees to pay him 15% rate of interest, compounded annually.**

Solution:

Given : A1 = Rs. 10,00,000/-

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