

Notes by-

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CONSTRUCTION MANAGEMENT

ASSIGNMENT NO. 07

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Assignment No. 7

1. The details of production cost of remedies of project are as under:

Total cost : Rs 65,000/-

Fixed cost : Rs 25,000/-

Sells : 800 units

Selling price : Rs 80,000/-

Profit desired : Rs 20,000/-

Find BEP in terms of units.

$$\begin{aligned}\text{Soln: } \text{Variable cost} &= \text{Total cost} - \text{Fixed cost} \\ &= 65,000 - 25,000 \\ &= 40,000/-\end{aligned}$$

$$\begin{aligned}\text{Variable cost per unit} &= \frac{40,000}{8,000} \\ &= 5/-\end{aligned}$$

Selling price = Rs 80,000/-

$$\begin{aligned}\text{Selling price per unit} &= \frac{80,000}{8,000} \\ &= \text{Rs } 10/-\end{aligned}$$

$$\begin{aligned}\text{BEP (units)} &= \frac{\text{Fixed cost}}{(\text{S.P. per unit} - \text{Variable cost per unit})} \\ &= 200\end{aligned}$$

$$= 25,000$$

$$10 - 5$$

$$= 500 \text{ units.}$$

Let x be the number of units produced.

$$\text{Profit} = \text{Sales} - \text{Total cost}$$

$$= x \times 10 - (25,000 + 5x)$$

$$\therefore 20,000 = 10x - 25,000 + 5x$$

$$\therefore 5x = 45,000$$

$$\therefore x = 9000 \text{ units.}$$

Q.2 A PSC product industry is engaged in production of PSC units being sold as Rs 3,200/- each. Fixed investment in industry was Rs 40,000/- 40,00,000/- & variable cost of production is 1800 / unit. How many units must be manufactured to reach the BEP & what level profit of Rs 20,00,000/- would be?

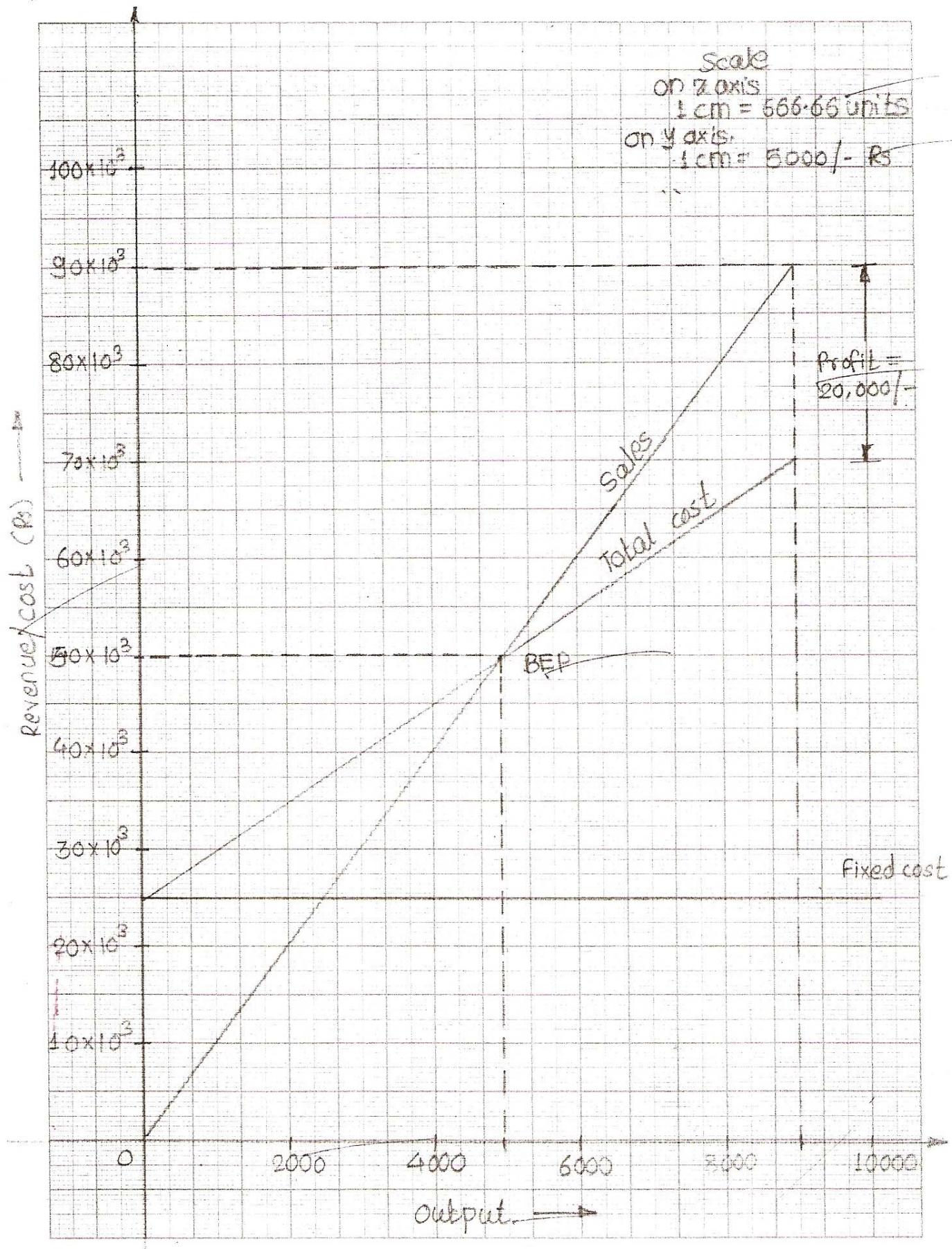
$$\text{Soln: Fixed cost} = \text{Rs } 40,00,000/-$$

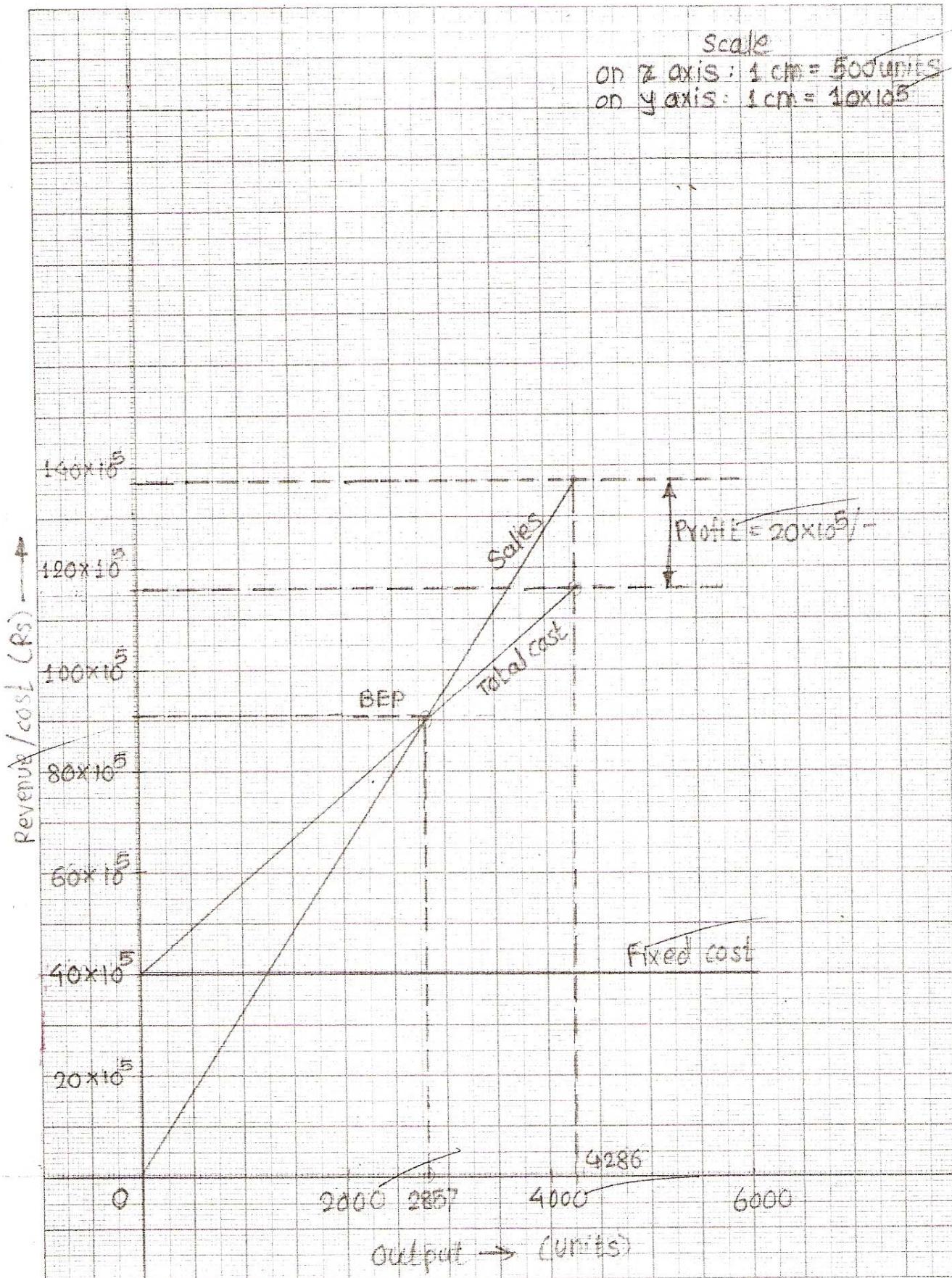
$$\text{Variable cost} = \text{Rs } 1800 \text{ per unit}$$

$$\text{Selling price} = \text{Rs } 3200 \text{ each.}$$

$$\text{Profit desired} = \text{Rs } 20,00,000/-$$

$$\text{BEP (in terms of no. of units)} = \frac{\text{Fixed cost}}{\text{(S.P. per unit} - \text{variable cost per unit})}$$





$$= \frac{40,00,000}{3200 - 1800}$$

$$= 2857.14 \text{ units.}$$

Output for desired profit of Rs 20,00,000/-

Let x be the No. of units reqd. to be produced
for achieving a profit of Rs 20,00,000/-

$$\text{Profit} = \text{Sales} - \text{Total cost}$$

$$= \text{Sales} - (\text{Fixed cost} + \text{Variable cost})$$

$$\therefore 20,00,000 = 3200x - (40,00,000 + 1800x)$$

$$\therefore x = 4285.71 \text{ units.}$$

BEP in terms of units = 2857.14.

The output required for achieving a profit
of Rs 20,00,000/- is 4286 units.

Graph shows details in terms of output
& revenue.

Q. 3. Explain different types of project risk.

following are different types of project
risk:

Project Completion Risk :

Completing the project in time & within the estimated cost itself is a major achievement. A project that is delayed will result in time over run. If the project promoters are unable to pump

additional funds required to meet the cost over run the project will come to a grinding half. Also delayed implementation means increase interest commitment on the borrowed funds for project with long period in fields of fast developing technology. There is risk of project not being complete due to technological obsolescence during course of project implementation.

Resource Risk:-

Raw material, power, fuel etc are resources used by a project work shortage of raw matls. may lead to reduction in capacity utilisation & higher cost of product which will make profitability estimated wrong.

Shortage of power, fuel & skilled man power may run risk of not earning the estimated returns.

Price Risk:-

Price fluctuation of both input & output affect the project unforeseen happening such as goals, intentions in price fixation ability of competitors to affect their product to consumers offer comparatively cheaper rate are likely

to have an adverse effect.

Technology Risk:-

Technology risk appear in two forms.

A project that is based on unproven technologies may have hidden defects which may have project short late. Rapid growth in technology may make a project obsolete in technology due to evaluation of latest technology.

Political Risk:-

The government interferences in (various) many forms such as levying & regulating taxes regulating monopolistic trade practices imposing impact duties promoting exports prohibiting export of certain commodities etc. political risk is a major risk since it can not be predicted easily.

Interest Rate Risk:-

Fluctuation in interest rate may bring in an adverse effect.

e.g.: If a project is funded by particular rate of interest & if interest rate falls down, the project that availed long term borrowing at higher interest rate has to service the loan only

at higher rate of interest, unless it makes alternative arrangement to mobilise funds of the prevailing rate & swap old borrowing which is difficult proposition. In such situation, project that were incorporated with high cost borrowing will find it difficult to complete with new constraint.

On other hand, if interest rate increases in future the interest on working capital finance increases which will result in lower profit margin than estimated at time of project appraisal.

Exchange rate risk:-

Exchange rate risk is arising from currency fluctuations, volatile exchange rates can reduce cost & productivity advantages gained over years of hard work. Firms exposed to international economy face this risk many exchange risk rate hedging tools such as forward cover leads & lack currently option & currency swaps etc. are available which can be efficiently made use of main curve exchange rate risk.

Q.4. Explain the techniques of risk management.

Following are techniques of risk mgmt.

- a) Break Even Analysis.
- b) Sensitivity analysis.
- c) Decision tree analysis.
- d) Monte-Carlo analysis.
- e) Game theory.

a) Break Even Analysis:

After implementation, the project starts earning profit or incurring loss based on actual cost of input actual sales realisat' etc.

BEP refers to the level of operation at which the project neither earns profit nor loss.

BEP also helps in identifying level of operation & level of operation reqd. to obtain specified period of profit to avoid loss etc.

Break even analysis starts with dividing the cost into two broad heads:

i) Fixed cost

ii) Variable cost.

i) fixed cost:-

They are certain cost that are fixed in nature, irrespective of change in volume of output.

ii) variable cost: These are cost that vary

directly with level of output.

From fig.

At BEP

Sales realisation = Fixed cost + Variable cost.

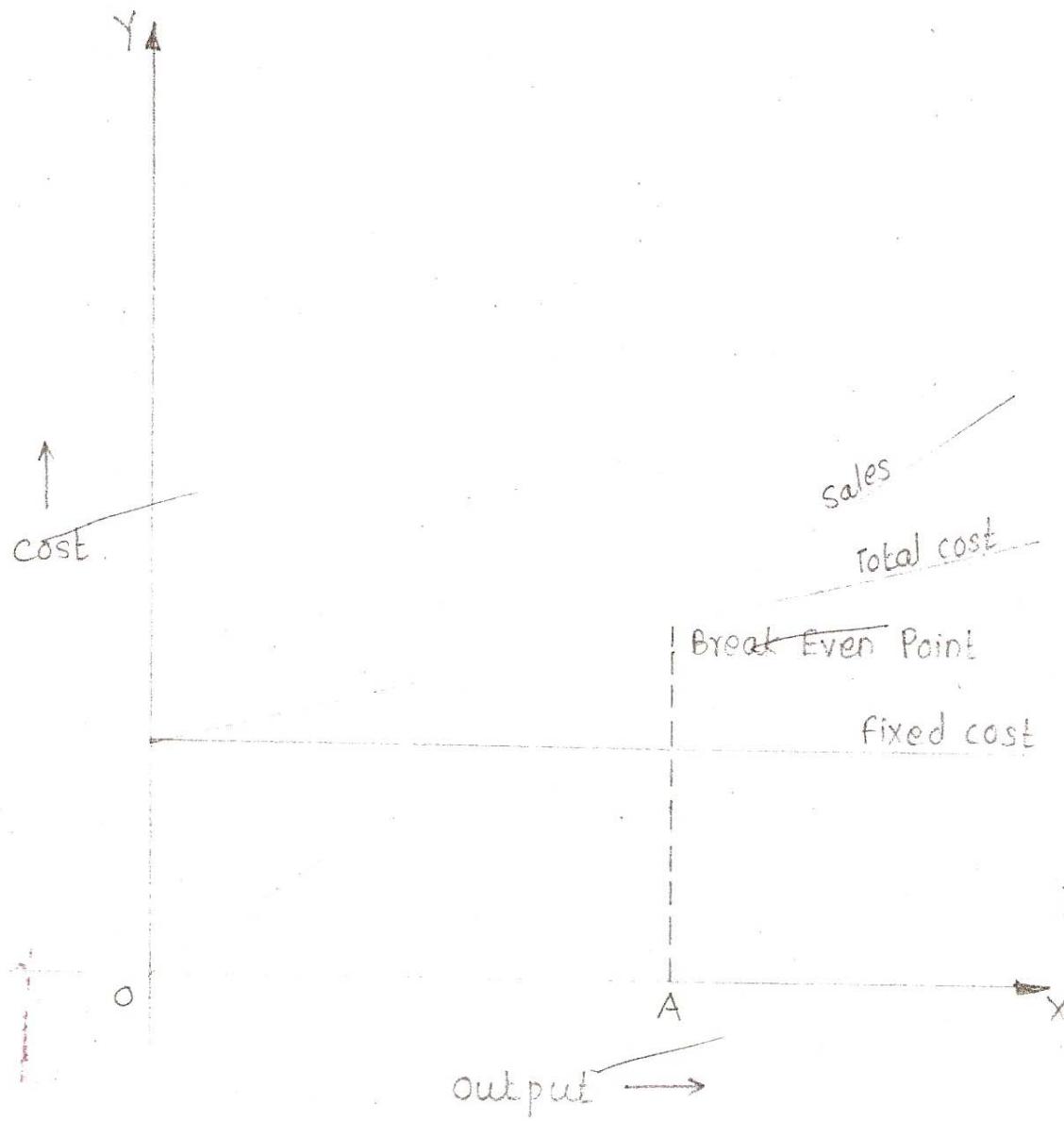
$$\text{Output} = \frac{\text{Fixed cost}}{\text{Selling price per unit} - \text{variable cost per unit}}$$

$$\text{BEP in terms of units} = \frac{\text{fixed cost}}{\text{Selling price per unit} - \text{variable cost per unit}}$$

$$\text{BEP in terms of Rs} = \frac{\text{fixed cost}}{\text{Contribution per unit}} \times \frac{\text{Selling price per unit}}{\text{Selling price per unit}}$$

b) Sensitivity approach:-

It is a technique that measures the change in profitability of a project caused by change in factors that affect cash inflow of a project. If a small change in factors leads to a major change in the profitability of proposed investment, the project is considered more sensitive to that factor, in other words, the



OA = Break Even Volume

project is more risky sensitivity of a project checked by observing the response measures of profitability (NPV, DSR, BEP to change the profitability.)

Sensitivity analysis provides the mgt. the much needed information as to which are critical factors that are prone to affect the profitability of the project.

c) Decision Free analysis:-

Decision free approach is a graphical technique that can be used for analysing pros & cons of alternative decision & choosing best possible action.

A decision tree is a diagrammatic representation of the logical relationship betw diff. parts of a complex situation & possible outcomes of diff. decisions.

A decision tree is made up to nodes & branches.

Nodes are of two types:

Decision points also called decision node. Change node also called as change point.

Decision point is represented by a square
change point denoted by a circle.

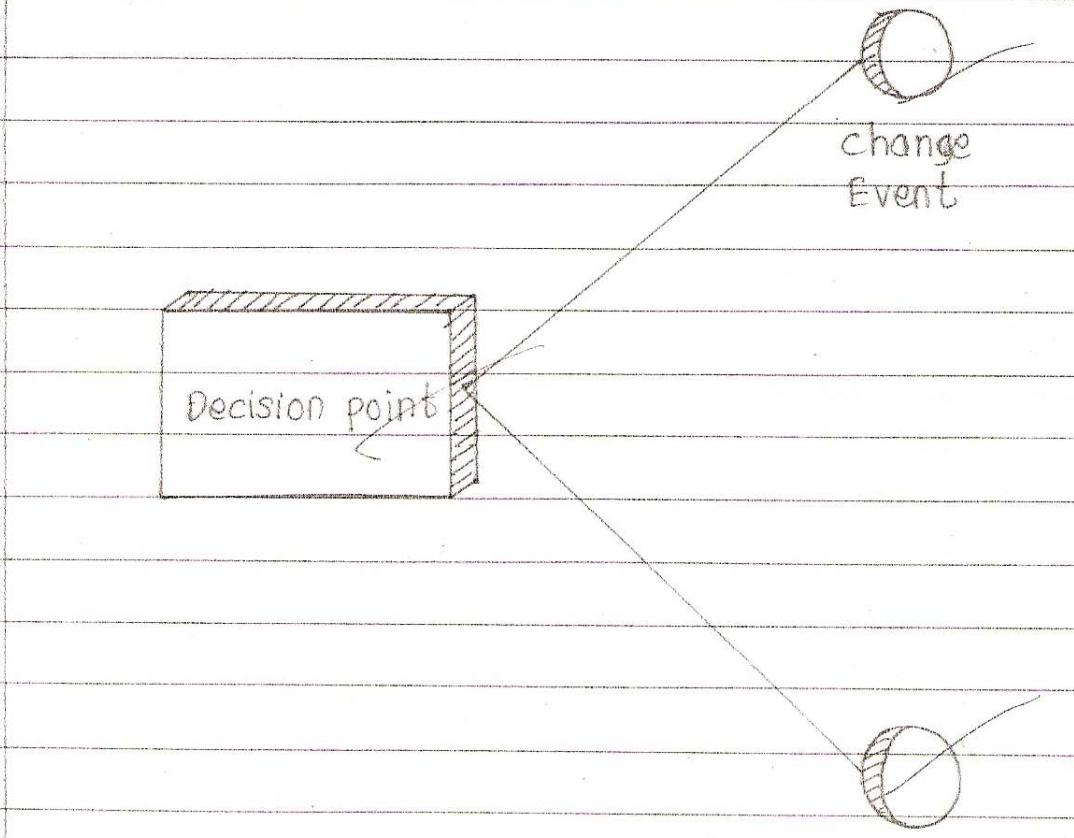


fig. shows decision point to change point.

Expected monetary value (EMV) :-

The effectiveness of any decision is measured only in terms of money. Hence outcome of all decisions are measured in terms of EMV. EMV provides a common base for comparing the outcomes of diff. decisions to one that is found more advantages

d) Monte-Carlo Simulation:-

"Monte Carlo" is a code given by van newnam to the techniques solving problems using random numbers. "Monte Carlo" technique can be used to solve variety of problems involving stochastic situation. It is very popular technique & is used in random No. to solve problem requiring decision making under uncertainty where as mathematical solution is highly complex.

The steps involved in "Monte Carlo" techniques are as follows:

- 1) From given probability of occurrence of events, establish cumulative probability.
- 2) Assign tag no. to the event in such a way that tag no. represent cumulative probability.
- 3) Obtain random no. of from a random No. value.
- 4) Correlate random no. with tag nos. assigned to event & identify the value for respective events.

e) Game theory:-

Game theory deals with situation in which two intelligent opponents have conflicting interest to achieve goals. The firm forms strategy to approach such competitive problems was developed

by, Van Newmann who named it "Game Theory".

The following are properties of competitive games:

- The No. of competitors are finite
- Each player has finite No. of strategies.

All the players need not necessarily have same No.s of strategies.

Each player chooses single course of action from first list of strategies available to him.

The outcome of play depends upon strategies followed by the player.

The objective of game theory is to criterion for selection of strategies by each player.

Recitation
10/01/03