ST2-SOLUTION - NME-032 - PROJECT MANAGEMENT.

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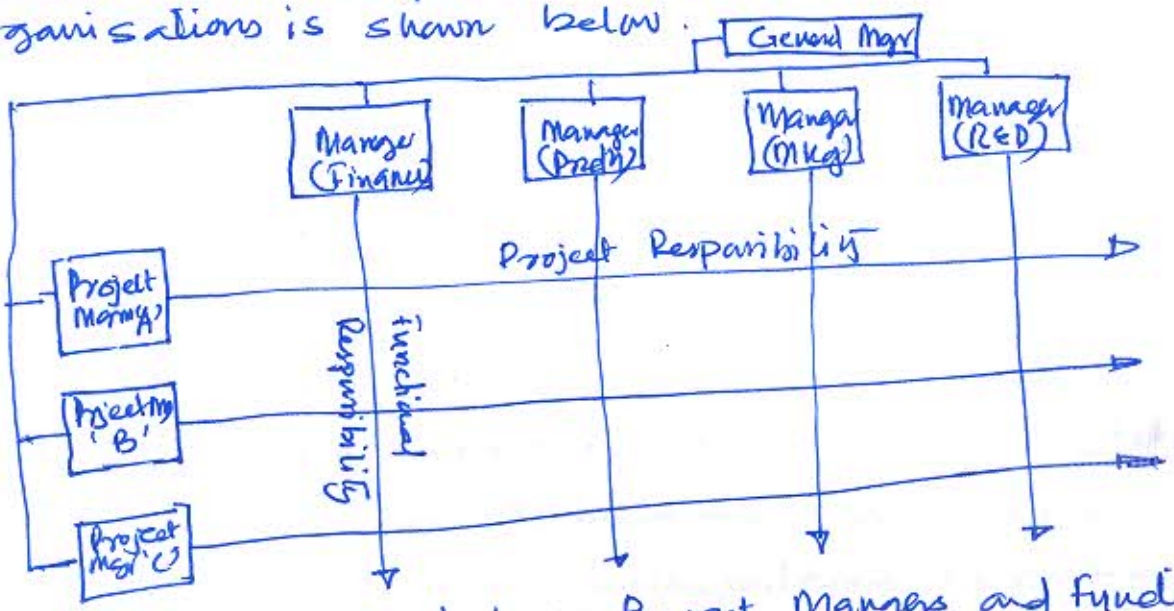
SECTION-A

SOL-1. The matrix form of organization is a combination of the merits of functional and product forms of organisation. This form and its structure is ideally suited for enterprises that are "project driven", and mostly used for construction projects and companies offering turn-key projects. The structure of this organisations is shown below.



The coordination between Project Mangers and Functional Managers is very important and both of these managers reports to the general manager. Both the responsibilities are to operate freely for the success of the project.

SOL-2. The objectives of Social-Cost-Benefit Analysis (SCBA) are as follows. SCBA aims to appraise the total impact that a project will have on an Economy, the expected objectives are.

- Contribution of the project to the GDP of the Economy.
- Contribution to improve the poorer sections of the society.
- Contribution towards reducing regional imbalances in growth & Dev.
- Justification of using the scarce resources of the economy
- Contribution of the project in improving/protecting the environmental condition.

SCBA is also known commonly as National Profitability Analysis and includes all the actual cost & Benefits of the project.

SOL-3. Risk can be defined as the variability of return from an investment. All the projects are prone to some kind of risk or the other and project face a host of risks. Some of the important risks are as follows

1. Project Completion Risk 2. Resource Risk 3. Price Risk
4. Technology Risk 5. Political Risk 6. Interest Rate Risk
7. Exchange Rate Risk.

SOL-4. Earnest Money Deposit (EMD) is a term commonly used in tenders under the Contracts in any Project Management Scenario.

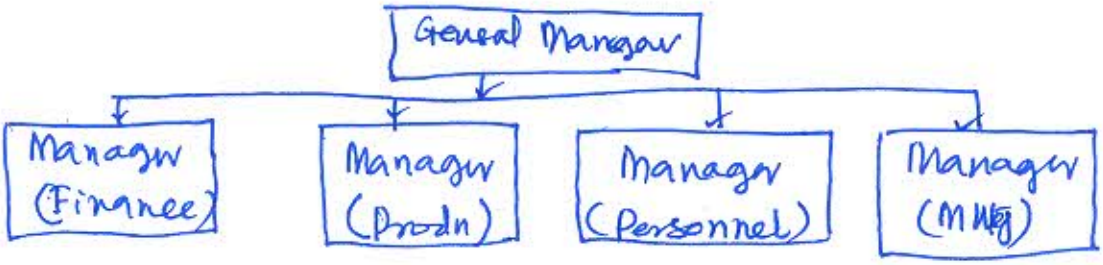
EMD is the amount to be deposited by all the tenderers when they submit their tender. The EMD amount varies from 1% to 3% of the tender value. Once the contract is finalised, the EMD remitted by all the unsuccessful tenderers are returned back. The EMD of the successful tenderer are retained back as a measure of caution, so that he will not withdraw his offer. Incase, the successful tenderer withdraws his offer he has to forego his EMD. EMD is payable normally by DD/Pay orders form a nationalised Bank. If the amount is large, a Bank guarantee is required in that case.

SOL-5. Project Appraisal is a process of detailed examination of various aspects of a given project before recommending the same. The institution that is going to fund the Project has to satisfy itself before providing financial assistance for the project. The lending institution has to ensure that the investment on the proposed project will generate sufficient returns on the investments made and the loan amount disbursed will be recovered with interests within a reasonable amount of time. There are five types of Appraisals in projects i.e Technical Appraisal, Commercial Appraisal, Economic, financial and lastly Managerial Appraisal.

SECTION - B

SOL-6. The fuctional structure and project organizatin structures are shown below to explain the comparision between them.

Functional organizatin:



Project organization:

The former is the most basic and logical form of organising at structure. Functional organizatin brings together all the activites related in one department and is under the general manager, who decides the final work plan. This is suitable for small organisations that offers limited line of products. If the company grows geographically and expands its product lines, the controlling will become ineffective.

The latter involves a structure, where the project manager is in controll of all the other departments. This is suited if the organisation has a complex project whose resource requirments are large. In such situations, all the resources required for the project are left at the disposal of the Project manager. The project manager has complete authority and full control over all resources assigned to the project.

The contrast between the two is that, the former had functional heads whereas the latter do not have any functional heads and controlled wholly by the Project manager.

SOL-7. The correct estimation of the capital cost of a project is the foundation over which the edifice of financial stands. The capital cost includes around ~~fifteen~~ eleven components and includes

1. Land
2. Land Development
3. Buildings
4. Plant and Machinery
5. Electricals
6. Transport and erection charges
7. Know how fees
8. Miscellaneen assets.
9. Preliminary and pre operative expenses.
10. Provision for contingencies.
11. Margin Money for working capital.

Explanation:

The land required for project needs to be analysed properly, whether the land is required and whether the building is required. The cost required to procure the land, its development and then the building construction estimates. The building includes different types ie. Main factory building, administrative buildings, Godowns etc. Then the cost of Plant and Machinery are to be estimated and that includes both indigenous plants and Imported plants. These includes basic sales price, taxes etc or free onboard value of the machineries. The electrical cost includes cost of cables, panel boards, voltage stabilizers etc. The transport and erection charges of the equipment and machineries comes in this component and includes unloading and Loading of the equipments / Machineries. The know-how / consultancy fees includes the know-how fees and the training cost of the employees in the production process. The miscellaneous head includes office equipments, furnitures, fire fighting equipments etc. The preliminary and pre operative Expenses includes mortgage expenses, Expense on capital issues, insurance charges. Contingencies include around 5-15% of the cost of non-firm items. Margin Money for working capital is the difference of the worker capital requirement and possible working capital loan that can be [illegible] from the bank.

SOL-8. A forecast is a prediction of a future situation. No forecast can be cent percent correct, however scientifically designed the forecasting techniques are; in view of the reason that future is uncertain.

The demand needs to be forecasted in two basic scenarios

(1.) New Product / Services where No previous data is available

(2) Old Product/Services where statistical data is available.

The first scenarios involves survey techniques to estimate demand, these forecasting techniques includes.

1. Jury of experts opinion Method : Experts in the particular field is requested to estimate the demand.
2. Delphi Technique : The method uses a panel of experts and carried out in rounds, till a certain consensus is arrived.
3. Consumer's Survey Method : A certain sample of a consumer population is approach through Market survey professionals and a demand is established.
4. Sales forecast composite : This method relies on the Sales professionals and their Manager who estimates the region wise demand and involves macro level indicators.

The second scenario is handled using Statistical Methods which are again of two types. The details are as follows.

1. Trend Analysis : Techniques include following methods to estimate demand from the past data.
   (a) Curve fitting
   (b) Moving average Method.
   (c) Weighted Moving Average Method.
   (d) Exponential Smoothing Methods.
2. Regression Technique.

Other Statistical Methods are. End use Method & leading indicator Method.

SOL. 9: A contract is a legal agreement. It is an exchange of promises by two or more persons. The contractor is a person, a firm or a company who undertakes contract.

Broadly contracts can be divided into two types.

1. Turnkey Contracts;
2. Non-Turnkey Contracts.

In the Turnkey contracts, the entire responsibility of the project execution is entrusted to the Contractor. It is as if the owner comes into the picture only when the project is completed and he turns the key of the plant to start production. This happens when the project involves high and modern technologies which the project promoters is not aware of, and the contractor is conversant with the technology. The contract includes a clause on performance guarantee as the promoter is not aware of any aspects related to the technology used, which will be invariably high end.

The ~~Non~~ turnkey contracts are preferred when the projects are small sized, the know-how for the project is available with the promoters and when there is a strong, competent and capable project team available with the organisation. The non-turnkey contracts can be of following types and the names explains the essence of the contracts.

(a) Piece-work Contract
(b) Lumpsum Contract
(c) Cost-plus percentage Contract
(d) Labour contract.

Sol 10.

The project appraisal involves critical analysis of all the aspects related to a project and is used by the lending organisations to evaluate the project. The project appraisal is one and the most important phase of a project management. We discuss four categories of project appraisal below.

1. Technical Appraisal:

Involves critical study of the following aspects.

1. Selection of Process/Technology 2. Scale of operations.
3. Raw Materials 4. Technical Knowhow
5. Collaborations Agreements 6. Product Mix
7. Selection and Procurement of Plant & Machineries.
8. Plant Layout 9. Location of the Project.
10. Project Scheduling and implementation.

All these ten aspects are analysed and a report is made for the technical appraisal.

2. Economic Appraisal:

Measures the effect of the project on the whole economy. The scarce resources are directed to maximize economic growth of the country. Policy makers make a choice based on the economic return. Government projects involves more economic growth of the county than the individual entrepreneurs which are mostly profit oriented.

3. Financial Appraisal:

These are worked in two major areas, the way to arrive at the cost of the project and secondly appropriate means of financing the project. It involves combinations of equity and debts. The revenue must be sufficiently high to repay the debts with interests.

4. Management Appraisal: This decides the success or failure of any project. This is purely qualitative and subjective in nature. It is concerned with human appraisal.

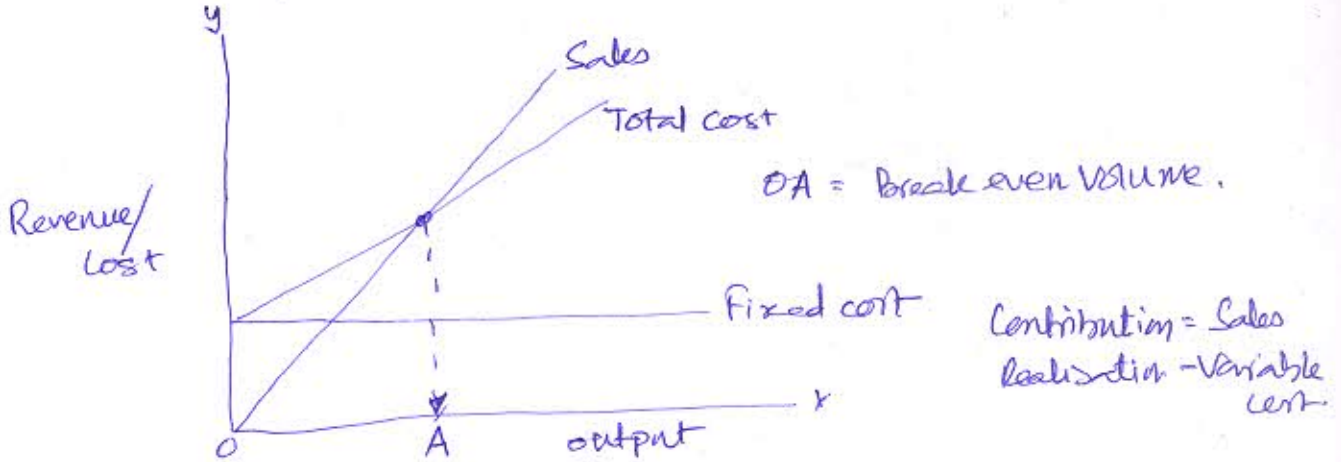
SECTION - C

SOL 11.

Many mathematical techniques are available for Project Risk Analysis, few are the tools for analysing small and medium sized projects. They are as follows.

1. Break Even Analysis:

We calculate and find out the Break even point (BEP) the refers to the level of operation at which the project neither earns profit nor incurs loss. Calculation of BEP for the given costs and price levels indicate the minimum capacity utilization that the project should aim at in order to be in a no-profit, no-loss situation. BEP also helps in identifying the level of Profit/loss for a specified level of operations and the level of operations required to attain a specified profit/ to avoid a specified loss. Break even analysis Breaks the cost into fixed cost and variable cost and a suitable graphical representation can be shown.

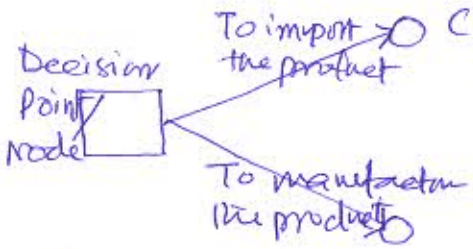


$$BEP = \frac{\text{Fixed Cost}}{\text{Contribution}} \times \text{Sales price/unit}.$$

2. Decision tree Analysis.

It is a graphical technique that can be used for analysing the pros and cons of alternative decisions and choosing the best possible course of action.

In real life situations, decisions are taken under conditions of uncertainty. In project management this is more so in view of the multiplicity of factors involved. It is represented by



3. Sensitivity Analysis:

It is an extension of Break even analysis, where the person measures the change in profitability of project caused by changes in the factors that affect the cash inflows of the project. If a small change in the one factor leads to a major change in the profitability of the proposed investment, the project is considered more sensitive to that factor otherwise the project is more risky.

4. Monte Carlo Simulation:

It is a very popular technique and it uses random numbers to solve problems requiring decision making under uncertainty where a mathematical solution is highly complex or impossible.

5. Game Theory:

Game theory deals with situations in which two intelligent opponents have conflicting interests. The objective of the "Game Theory" is to develop a rational criterion for the selection of a strategy/strategies by each decision maker. Since games are rooted in conflict of interests, the optimal solution selects one or more strategies for each alternative players, so that the chosen strategy does not improve the benefit to either player.

Sol 12.

The demand for Nike Training Shoes (Dual Fusion TR5) is said to vary in random fashion. We use Monte-Carlo Simulation technique to know the demand Pattern. Let us make a table and solve the problem step wise.

Step 1: Establishing Cummulative Probability and Tag Number.

Sl.No.	Demanded Per Day Pairs/Days.	Probability	Cummulative Probability	Tag Numbers.
1	100	0.20	0.20	0-19
2	112	0.22	0.42	20-41
3	89	0.14	0.56	42-55
4	90	0.34	0.90	56-89
5	175	0.10	1.00	90-99

Step 2: Obtain Random Numbers from the table for twenty trials and simulate the demand of pairs/day.

Trial No	Random NO	Simulated Demand (Pairs/day)	Trial No	Random No	Simulated Demand (pairs/day)
1	65	90	11	75	90
2	70	90	12	22	112
3	51	89	13	31	112
4	19	100	14	39	112
5	81	90	15	86	90
6	06	100	16	74	90
7	30	112	17	95	175
8	79	90	18	00	100
9	33	12	19	84	90
10	89	90	20	48	89

We take the (fourth row and fifth column) and start with 65 and move right side to generate the numbers. The Simulated demand for 20 days are presented for Nike Training Shoe (Dual Fusion TR5) in The Simulated Demand table column.

— x — — x — — x —