Paper 9 – Operations Management & Strategic Management

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Full Marks : 100 **Time allowed: 3 hours**

The figures in the margin on the right side indicate full marks.
This question paper has two sections.
Both the sections are to be answered subject to instructions given against each.

Section – I: (Operations Management)

1. (a) Choose the most correct alternatives: [1×10=10]

(i) The activity of specifying when to start the job and when to end the job is known as:
(a) Planning,
(b) Scheduling,
(c) Timing,
(d) Follow-up.

(ii) Routine and Scheduling becomes relatively complicated in
(a) Job production,
(b) Batch production,
(c) Flow production,
(d) Mass production

(iii) Conducting occasional check-ups of the products manufactured or assembled to ensure high quality of the production is known as:
(a) Planning
(b) Scheduling
(c) Inspection
(d) Routing

(iv) This aims at finding the best and most efficient way of using the available resources - men, materials, money and machinery:
(a) Time Study
(b) Work Study
(c) Method Study
(d) Job Evaluation

(v) The time by which an activity can be rescheduled without affecting the other activities - preceding or succeeding is called as
(a) Slack
(b) Independent Float
(c) Free Float
(d) Total Float

(vi) Which one of the following standards is associated with the "Quality Assurance in Final Inspection Test"?
(a) ISO 9001
(b) ISO 9002
(c) ISO 9003
(d) ISO 9004

(vii)The lead time is
(a) Time for placeholders for materials
(b) Time of receiving materials
(c) Time between receipt of material and using materials
(d) Time between placing the order and receiving the materials

(viii) Which of the following models deals with the physical movement of goods from different supply origins to a number of different demand destinations?
(a) Simulation
(b) Transportation
(c) Lean operations
(d) Line balancing

(ix) The recent trend in the Production/Operations management which suggests the use of minimal amount of resources to produce a high volume of high quality goods with some variety is referred to as:
(a) SCM
(b) TQM
(c) Lean Production
(d) Just-In-Time

(x) With reference to project management, identify which of the following statement is NOT correct?
(a) Gantt chart is a principal tool used in scheduling and also in some methods of loading.
(b) Routing is the first step in the production planning.
(c) The cost of any activity is proportional to its time of completion.
(d) The free float can be calculated by subtracting EFT from EST.

(b) Match the terms in Column I with the relevant terms in Column II [1×6=6]

Column I	Column II
(A) Furniture	(i) Assembly line
(B) Hydro-electricity	(ii)Job Evaluation
(C)Television set	(iii) Carpentry
(D)Cement	(iv) Turbo-alternator
(E) Aviation Fuel	(v) Rotary Kiln
(F) Ranking Method	(vi) Refinery

(c) State whether the following statements are True/False? [1×4=4]
(i) Merit Rating is used to determine the cost of a product ( )
(ii) Increase in productivity leads to retrenchment of work force ( )
(iii) Project costs increase as the duration of the project increases ( )
(iv) Job Evaluation is a systematic approach to ascertain the labour worth of a job ( )
(v) Production planning and control is essentially concerned with the control of Finished goods ( )
(vi) Breakdown maintenance doesn't require use of standby machines ( )

Answer:

1. (a) (i) (b)
(ii) (b)
(iii) (c)
(iv) (b)
(v) (b)
(vi) (c)
(vii) (d)
(viii) (b)
(ix) (c)
(x) (d)

(b)

Column I	Column II
(A) Furniture	(i) Carpentry
(B) Hydro-electricity	(ii) Turbo-alternator
(C)Television set	(iii) Assembly line
(D)Cement	(iv) Rotary Kiln
(E) Aviation Fuel	(v) Refinery
(F) Ranking Method	(vi) Job Evaluation

(c) (i) (False)
(ii) (True)
(iii) (True)
(iv) (True)
(v) (False)
(vi) (False)

2. (a) Define forecasting. Why sales forecasting is the most important activity in the business? [6]

(b) An investigation into the use of scooters in 5 towns has resulted in the following data: Population in town

Population in town (in lakhs)	**(X)**	**4**	**6**	**7**	**10**	**13**
No. of scooters	**(Y)**	**4,400**	**6,600**	**5,700**	**8,000**	**10,300**

Fit a linear regression of Y on X and estimate the number of scooters to be found in a town with a population of 16 lakhs. [10]

Answer:

2. (a) Forecasting means peeping into the future. As future is unknown and is anybody's guess but the business leaders in the past have evolved certain systematic and scientific methods to know the future by scientific analysis based on facts and possible consequences. Thus, this systematic method of probing the future is called forecasting.

All business and industrial activities revolve around the sale and its future planning. To know what a business will do we must know its future sales. All other activities depend upon the sales of the concern. Sales forecasting as a guiding factor for a firm because it enables the firm to concentrate its efforts to produce the required quantities, at the right time at reasonable price and of the right quality. Sales forecasting is the basis of planning the various activities i.e.; production activities, pricing policies, programme policies and strategies, personnel policies as to recruitment, transfer, promotion, training, wages etc.

(b)

Computation of trend value

Population (in lakhs) (X)	**No. of scooters Demanded** (Y)	**Squares of Population** (X^2)	**Product of population and No. of scooters demanded** (XY)
4	4,400	16	17,600
6	6,600	36	39,600
7	5,700	49	39,900
10	8,000	100	80,000
13	10,300	169	1,33,900
$\Sigma X = 40$	$\Sigma Y = 35,000$	$\Sigma X^2 = 370$	$\Sigma XY = 3,11,000$

Regression equation of Y on X

$Y = a + bX$

To find the values of a and b we will have to solve the following two equations

$\Sigma Y = na + b\Sigma X$ ... (i)

$\Sigma XY = a\Sigma X + b\Sigma X^2$ ....(ii)

By putting the values, we get

35,000 = 5a + 40b ... (iii)

3,11,000 = 40a + 370b ... (iv)

By multiplying equation no. (iii) by 8 putting as equation (v) we get,

2,80,000 = 40a + 320b ... (v)

By subtracting equation (v) from equation (iv), we get

31,000 = 50b

or, 50b = 31,000

or, b = 31000/50 = 620

By substituting the value of b in equation no. (iii), we get

35,000 = 5a + 40b

or35,000 = 5a + 40 × 620

or35,000 = 5a + 24,800

or10,200 = 5a

or a = 10200/5 = 2040

Now putting the values of a and b the required regression equation of Y on X, is

$Y = a + bX$ or, $Y = 2040 + 620X$

When X = 16 lakhs then $Y = 2040 + 620 (16)$

or Y = 2040 + 9920

or Y = 11,960

Hence, the expected demand of scooters for a town with a population of 16 lakhs will be 11,960 scooters.

3. (a) What does Product Design do? Discuss – Process design and selection. [6]

(b) Machine A costs of ₹ 80,000. Annual operating costs are ₹ 2,000 for the first year, and they increase by ₹ 15,000 every year (for example, in the fourth year the operating costs are ₹ 47,000). Determine the lease age at which to replace the machine. If the optimal replacement policy is followed; what will be the average yearly cost of operating and owning the machine? (Assume that the resale value of the machine is zero when replaced, and that future costs are not discounted.

(i) Another machine B costs ₹ 1,00,000. Annual operating cost for the first year is ₹ 4,000 and they increase by ₹ 7,000 every year. The firm has a machine of type A which is one year old. Should the firm replace it with B and if so, when?

(ii) Suppose the firm is just ready to replace the machine A with another machine of the same type, just then the firm gets and information that the machine B will become available in a year. What should the firm do? [10]

Answer:

3. (a) The activities and responsibilities of product design include the following:

(i) Translating customer needs and wants into product and service requirements (marketing).
(ii) Refining existing products (marketing).
(iii) Developing new products (marketing, product design and production).
(iv) Formulating quality goals (quality assurance, production).
(v) Formulating cost targets (accounting).
(vi) Constructing and testing prototype (marketing, production).
(vii) Documenting specifications (product design).

Process Design is concerned with the overall sequences of operations required to achieve the product specifications. It specifies the type of work stations to be used, the machines and equipments necessary to carry out the operations. The sequence of operations are determined by (a) the nature of the product, (b) the materials used, (c) the quantities to be produced and (d) the existing physical layout of the plant.

The process design is concerned with the following:

(i) Characteristics of the product or service offered to the customers.
(ii) Expected volume of output.
(iii) Kinds of equipments and machines available in the firm.
(iv) Whether equipments and machines should be of special purpose or general purpose.
(v) Cost of equipments and machines needed.
(vi) Kind of labour skills available, amount of labour available and their wage rates.
(vii) Expenditure to be incurred for manufacturing processes.
(viii) Whether the process should be capital-intensive or labour-intensive.
(ix) Make or buy decision.
(x) Method of handling materials economically.

(b) The operating cost of machine A in successive years are as follows:

Year	1	2	3	4	5
Operating Cost (₹)	2,000	17,000	32,000	47,000	62,000

Calculations for average cost of Machine A

Replacement at the end of year	Cumulative operating cost (in ₹)	Depreciation Cost (in ₹)	Total Cost (in ₹)	Average Cost per year (in ₹)
1	2,000	80,000	82,000	82,000
2	19,000	80,000	99,000	49,500
3	51,000	80,000	1,31,000	43,666
4	98,000	80,000	1,78,000	44,500
5	1,60,000	80,000	2,40,000	48,000

It is clear from the table that machine A should be replaced at the end of third year. The average yearly, cost of owning & operating machine A in this situation will be ₹ 43,666.

(i) The operating cost of machine B are as follows:

Year	1	2	3	4	5	6
Operating Cost (₹)	4,000	11,000	18,000	25,000	32,000	39,000

Calculations for average cost of Machine B

Replacement at the end of year	Cumulative operating cost (in ₹)	Depreciation Cost (in ₹)	Total Cost (in ₹)	Average Cost per year (in ₹)
1	4,000	1,00,000	1,40,000	1,04,000
2	15,000	1,00,000	1,15,000	57,500
3	33,000	1,00,000	1,33,000	44,333
4	88,000	1,00,000	1,58,000	39,500
5	90,000	1,00,000	1,90,000	38,000
6	1,29,000	1,00,000	2,29,000	38,166

It is clear from the above Table that if machine B is replaced after 5 years then its average cost per year is ₹ 38,000. Since the lowest average cost for machine B (₹ 38,000) is less than the lowest average cost for machine A (R.s 43,666), the machine A should be replaced by machine B. Now to find the time of replacement of Machine A by Machine B, we proceed as follows:

The machine A is replaced by machine B at the time (age), when its running cost of the next year exceed the lowest average yearly cost ₹ 38,000 of machine B. Further, the total cost of the machine A in the successive years are computed as follows:

Year	1	2	3	4	5
Total cost in the year (₹)	82,000	99,000 – 82,000 = 17,000	1,31,000 – 99,000 = 32,000	1,78,000 – 1,31,000 = 47,000	2,40,000 – 1,78,000 = 62,000

The running cost of fourth year of machine A is ₹ 47,000 which is more than the lowest average yearly cost ₹ 38,000 of machine B. therefore, the machine A should be replaced by machine B, when its age is 1 year. Since the machine A is one year old now, it should be replaced just now.

(ii) Install new machine now and replace it with machine B during the third year.

4. (a) A farmer has a firm with 125 acres. He produces Carrot, Beetroot and Potato. Whatever he produces is fully sold in the market. He gets ₹ 5 per kg for carrot, ₹ 4 per kg for Beetroot and ₹ 5 per kg for potato. The average yield is 1500 kg for Carrot per acre, 1800 kg of Beetroot per acre and 1200 kg of potato per acre. To produce each 100 kg of Carrot and Beetroot and 80 kg of Potato, a sum of ₹ 12.50 has to be spent for manure. Labour required for each acre to raise the crop is 6 men – days for carrot and Potato each and 5 man-days for Beetroot. A total of 500 man days of labour of the rate of ₹ 40 per man – day are available. Formulate a LPP to maximize the farmer's total profit. [10]

(b) Describe the objective of Time Study. [6]

Answer:

4. (a) Let X_1, X_2 and X_3 be the number of acres allotted for cultivating carrot, beetroot and potato respectively. The profit from the produces is determined in the following manner -

Particulars per acre	Carrot	Beetroot	Potato
Selling Price	₹ 5 per Kg × 1500Kgs = ₹ 7500	₹ 4 per Kg. × 1800 Kgs. = ₹ 7200	₹ 5 per Kg × 1200 Kgs = ₹ 6000
Less: Manure Cost	1500 Kgs × ₹ 12.50/100 = ₹ 187.50	1800 Kgs × 12.50/100 = ₹ 225.00	1200 Kgs. × ₹ 12.50/80 = ₹ 187.50
Less: Labour Cost	₹ 40 × 6 = ₹ 240	₹ 40 × 5 = ₹ 200	₹ 40 × 6 = ₹ 240
Profit per acre	₹ 7072.50	₹ 6775	₹ 5572.50

Maximize Profit $Z = 7072.50 X_1 + 6775 X_2 + 5572.5 X_3$

Subject to $X_1 + X_2 + X_3 \leq 125$ (Land availability)

$6X_1 + 5X_2 + 6X_3 \leq 500$ (Man days availability)

$X_1, X_2, X_3 \geq 0$ (Non-Negativity assumption)

(b) Time study is concerned with the determination of the amount of time required to perform a unit of work. It consists of the process of observing and recording the time required to perform each element of an operation so as to determine the reasonable time in which the work should be completed. Time study is defined by ILO as below 'Time study is a work measurement technique for recording the times and rates of working for the elements of a specified job carried out under specified conditions and for analyzing the data so as to obtain the time necessary for carrying out the job at a defined level of performance'.

Objective of time study:
The main objective is 'to determine by direct observation, the quantity of human work in a specified task and hence to establish the standard time, within which an average worker working at a normal pace should complete the task using a specified method'.

The other objectives are:
(i) To furnish a basis of comparison for determining operating effectiveness.
(ii) To set labour standard for satisfactory performance.
(iii) To compare alternative methods in method study in order to select the best method.
(iv) To determine standard costs.
(v) To determine equipment and labour requirements.
(vi) To determine basic times/normal times.
(vii) To determine the number of machines an operator can handle.
(viii) To balance the work of operators in production or assembly lines.
(ix) To provide a basis for setting piece rate or incentive wages.
(x) To set the completion schedules for individual operations or jobs.

5. (a) Draw the network for the following activities and find critical path and total duration of project.

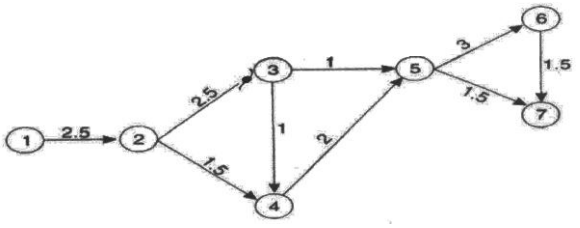
Activity	Duration (months)	Activity	Duration (months)
1-2	2.5	4-5	2.0
2-3	2.5	5-6	3.0
2-4	1.5	6-7	1.5
3-4	1.0	5-7	1.5
3-5	1.0		

[8]

(b) Product A has a Mean Time Between Failures (MTBF) of 30 hours and has a Mean Time to Repairs (MTTR) of 5 hours. Product B has a MTBF of 40 hours and has a MTTR of 2 hours.
(i) Which product has the higher reliability?
(ii) Which product has greater maintainability?
(iii) Which product has greater availability? [8]

Answer:

5. (a)



Paths	Duration
1-2-3-5-6-7	2.5+2.5+1+3+1.5 = 10.5
1-2-3-5-7	2.5+2.5+1+1.5 = 7.50
1-2-3-4-5-6-7	2.5+2.5+1+2+3+1.5 = 12.5 (Critical Path)
1-2-3-4-5-7	2.5+2.5+1+2+1.5 = 9.5
1-2-4-5-7	2.5+1.5+2+1.5 = 7.5
1-2-4-5-6-7	2.5+1.5+2+3+1.5 = 10.5

(b) (i) Product B, with higher MTBF (i.e., 40 hours) than Product A (i.e., 30 hours), is more reliable since it has lesser change failure during servicing.

(ii) By MTTR we mean the time taken to repair a machine and put it into operation. Thus Product B, with lesser MTTR (i.e., 2 hours) than Product A (i.e., 5 hours), has greater maintainability.

(iii) Availability of a machine/product = MTBF/(MTBF+MTTR)
Therefore, availability of Product A = 30/(30+5) = 30/35 = 85.714%
Availability of product B = 40/(40+2) = 40/42 = 95.238%
Hence, Product B has more availability.

Section – II: (Strategic Management)

6. Choose the correct answer from the given alternatives: [1×6=6]

(i) A strategic business unit (SUB) is defined as a division of an organisation:
(a) That help in the marketing operation;
(b) That enable managers to have better control over the resources;
(c) That help in the choice of technology;
(d) That help in the allocation of scarce resources;
(e) That help in identifying talents and potentials of people.

(ii) The essential ingredients of Business Process Re-engineering are:
(a) Continuous improvements of products, processes and technologies.
(b) Advanced planning in the areas of technologies, processes and strategic partnerships etc.
(c) Fundamental rethinking and radical redesign of business process to achieve dramatic results.
(d) Generation, comparison and evolution of many ideas to find out one worthy of development.
(e) Identification and selection of layouts most suited for products and processes.

(iii) Matrix structure
(a) Structural grouping is geographic
(b) Simultaneous combination of similar activities on the basis of function
(c) Adopts parts of both functional and divisional structures at the same level of management
(d) Creates a dual chain of command

(iv) The conditional of Low share, Negative growth and negative cash flow indicates -
(a) Dogs.
(b) Dodos.
(c) Donkey.
(d) Dinosaurs.

(v) Mckinsey's 7-s framework consists of:
- **(a) Structure, strategy, software, skills, styles, staff and supervision**
- **(b) Structure, strategy, systems, skills, styles, syndication and shared values.**
- **(c) Structure, strategy, systems, skills, steering power, styles and shared values.**
- **(d) Structure, strategy, staff, skills, systems, shared values, super ordinate goal.**
- **(e) None of the above.**

(vi) A product line is a group of product that
- **(a) are closely related**
- **(b) are marketed through the same channel**
- **(c) performance a similar function for being sold to the same customers**
- **(d) all of the above**

Answer:

6. (i) (b)

(ii) (c)

(iii) (d)

(iv) (b)

(v) (d)

(vi) (d)

Answer any one question form the following:

7. (a) What do you mean by Strategies? State its features.

(b) Discuss contingency planning & its seven steps. [6+6]

Answer:

7. (a) Strategy is all about integrating organizational activities and utilizing and allocating the scarce resources within the organizational environment so as to meet the present objectives. While planning a strategy it is essential to consider that decisions are not taken in a vacuum and that any act taken by a firm is likely to be met by a reaction from those affected, competitors, customers, employees or suppliers.

Strategy can also be defined as knowledge of the goals, the uncertainty of events and the need to take into consideration the likely or actual behavior of others. Strategy is the outline of decisions in an organization that shows its objectives and goals, reduces the key policies, and plans for achieving these goals, and defines the business the company is to carry on, the type of economic and human organization it wants to be, and the contribution it plans to make to its shareholders, customers and society at large.

Features of Strategy:

(i) Strategy is important to foresight, the uncertain events of firms/industries.

(ii) Strategy deals with long term developments rather than routine operations. For example innovations or new products, new methods of productions, or new markets to be developed in future.

(iii) Strategy is created to deal behavior of customers and competitors.

(iv) Strategy is a well defined roadmap of an organization. It defines the overall mission, vision and direction of an organization. The objective of a strategy is to maximize an organization's strengths and to minimize the strengths of the competitors.

(b) Contingency plans can be defined as alternative plans that can be put into effect if certain key events do not occur as expected. Only high-priority areas require the insurance of contingency plans. Strategists cannot and should not try to cover all bases by planning for all possible contingencies. But in any case, contingency plans should be as simple as possible.

Steps in Contingency Planning

Robert Linnemam and Rajan Chandran have suggested that a seven step process as follows:

Step 1 - Identify the beneficial and unfavourable events that could possibly derail the strategy or strategies.

Step 2 - Specify trigger points. Calculate about when contingent events are likely to occur.

Step 3 - Assess the impact of each contingent event. Estimate the potential benefit or harm of each contingent event.

Step 4 - Develop contingency plans. Be sure that contingency plans are compatible with current strategy and are economically feasible.

Step 5 - Assess the counter impact of each contingency plan. That is, estimate how much each contingency plan will capitalize on or cancel out its associated contingent event. Doing this will quantify the potential value of each contingency plan.

Step 6 - Determine early warning signals for key contingency event. Monitor the early warning signals.

Step 7 - For contingent event with reliable early warning signals, develop advance action plans to take advantage of the available lead time.

8. (a) Discuss the differences in Strategic Management & Strategic Planning.

(b) Define SBU. What are its merits & demerits? [6+6]

Answer:

8. (a) The basic difference between Strategic management and Strategic planning are as follows:

Strategic Management	Strategic Planning
1. It is focused on producing strategic results; new markets; new products; new technologies etc.	1. It is focused on making optimal strategic decisions
2. It is management by results.	2. It is management by plans
3. It is an organizational action process	3. It is an analytical process
4. It broadens focus to include psychological, sociological and political variables.	4. It is focused on business, economic and technological variables
5. It is about choosing things to do and also about the people who will do them.	5. It is about choosing things to do

(b) SBU groups similar divisions into "Strategic Business Units" and then delegate's authority and responsibility of each unit to a senior executive who is normally identified as CEO or MD of that SBU. It is an extension of Divisional structure.

SBU Structure
Big organisation like Unilever, etc have many SBUs for their different categories of products like Cosmetics, Food products and Beverages, etc, and each is managed through separate unit head.

Advantages:
(i) Promotes accountability since units" heads are responsible for individual SBU profitability
(ii) Career development opportunities are further higher in this structure
(iii) Allow better control of categories of products manufacturing, marketing and distributions
(iv) Helps to expand in different related and unrelated businesses

Disadvantages:
(i) May provide inconsistent approach to tackle customers, etc, because each unit may work in it's own way to handle situations
(ii) High cost approach

9. Write short notes on any three of the following four questions: [4×3=12]

(a) PEST Framework;
(b) Approaches in Strategic Planning;
(c) SWOT Analysis;
(d) Plant location.

Answer:

9. (a) PEST analysis refers to Political, Economical, Social, and Technological factors which manipulate the business environment. SWOT analysis refers to Strengths, Weaknesses, Opportunity and Threats. These factors are prime determinants of strategic planning. Without SWOT and PEST analysis companies might fail to achieve desired goals.

PEST Analysis looks at external factors and is primarily used for market research. It is used as an alternative to SWOT analysis:
(i) Political – These are the external factors that influence the business environment. Government decisions and policies affect a firm's position and structure, Tax laws, monetary and fiscal policies as well as reforms of labor and workforce, all influence companies in future. These factors are important and need to be managed in order to overcome uncertainty.
(ii) Economical – Economical factors are the most important since it impacts business in the long run. Inflation, interest rates, economic growth and demand/supply trends are to be considered and analyzed effectively before planning and implementing. Economic factors affect both consumers and enterprises.
(iii) Social – Social factors involve the trends of population, domestic markets, cultural trends and demographics. These factors help businesses assess the market and improve their products/service accordingly.
(iv) Technological – This analyses the technology trends and advancements in business environment, innovations and advancements lowers barriers to entry plus decreased production levels as it results in unemployment. This includes research and development activity, automation and incentives.

(i) It presents a business' standing and position, i.e. whether it is weak or strong
(ii) It informs about both internal and external factors that affect a firm's success and/or failure
(iii) It helps firms assess the report and take counter measures for improvement and analyzing threats
(iv) It forecasts the future and sheds light on the current situation
(v) Evaluates business environment and allows firms to make strategic decisions
(vi) Prevents future failure and creates a system of continuous success
(vii) Provides companies with a reality check on their performance and shortcoming
(viii) Enables firms to understand the economy and market and expand
(ix) Provides a mechanism to identify threats and opportunities
(x) Enables companies to learn about markets and enter new markets nationally or globally.

(b) Approaches in Strategic Planning

It is important to operate a planning process which will not only produce realistic and potentially rewarding plans but will also secure the support of all those involved in implementing them. There are three approaches that can be adopted to strategic planning:

(i) A top-down process, in which managers are given targets to achieve which they pass on down the line.

(ii) A bottom-up process, in which functional and line managers in conjunction with their staff submit plans, targets and budgets for approval by higher authority.

(iii) An iterative process, which involves both the top-down and bottom-up setting of targets. There is a to-and-from movement between different levels until agreement is reached. However, this agreement will have to be consistent with the overall mission, objectives and priorities and will have to be made within the context of the financial resources available to the organization. The iterative approach, which involves the maximum number of people, is the one most likely to deliver worthwhile and acceptable strategic plans.

(c) SWOT Analysis:

Gathering data about the general, operating, and internal environments provides the raw material from which to develop a picture of the organisational environment.

SWOT analysis refines this body of information by applying a general framework for understanding and managing the environment in which an organisation operates. (The acronym SWOT stands for Strengths, Weaknesses, Opportunities, and Threats.) In many respects, the sophisticated analytical techniques discussed throughout the text are further refinements of basic SWOT analysis. In addition, students have repeatedly told us that SWOT is an excellent way to begin a case analysis. SWOT analysis attempts to assess the internal strengths and weaknesses of an organisation and the opportunities and threats that it's external environment presents. SWOT seeks to isolate the major issues facing an organisation through careful analysis of each of these four elements. Managers can then formulate strategies to address key issues.

(d) Plant Location:

Plant location is essentially an investment decision having long-term significance and implied economic effects. A good decision plays off; a bad decision can cause grim financial difficulties. Once a plant is acquired, it is a permanent site that cannot readily be sold. The management may also contemplate relocation of the plant when business expansion and advanced technology require additional facilities to serve new market areas, to produce new products, or simply to replace the old, obsolete plants to increase the company's production capacity.

Before a location for a plant is sought, long range forecasts should be made anticipating the future needs of the company. These should be based on the company's expansion policy, the anticipated diversification of products, the trends in market demand, geographical distribution, material and labour supply, and any other foreseeable influences. Thus, plant location decisions require intensive study of economic and socio-political circumstances.

The accuracy of forecasting is essential regarding rising demand and anticipated sales increases. Miscalculation in this respect may post serious problems before the company can occupy the new facilities once built and expand the new facilities subsequently due to land and environmental constraints.

The selection of an appropriate plant site calls for location study of the region in which the factory is to be situated, the community in which it should be placed and finally, the exact site in the city or countryside.