

Solution cum Scheme of Evaluation

IV/IV B.Tech (Regular) Degree Examination

14ME701

Industrial Engineering & Entrepreneurship Development

Mechanical Engineering

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1.

12x1M = 12M

a) Define management

Management is an art of getting things done through the efforts of other people.

b) List the types of organization structures

- Line organization structure
- Line and staff organization structure
- Functional organization structure

c) What are the market mix variables?

Product, price, place and promotion

d) State any two reasons that improve productivity

Productivity of any system can be improved either by proper use of resources or by effective utilization of system or processes. Some action plans are:

1. Machine : manual labor be replaced by machines
Reliable machines
Automation
2. Management: Motivated workforce
Better planning and coordination
Effective control of processes
3. Process: computerization of system
Use of management information system
Improvement in scheduling
Better material flow
Fast and accurate retrieval of parts

e) Define standard time

Standard time = Normal time + Allowances

f) List the sampling plans

- Single sampling plan
- Double sampling plan
- Sequential sampling plan

g) What are the elements of quality?

- Validity/Consistency
- Completeness
- Timeliness
- Accuracy

h) List any four functions of HRM

Operative functions:

Procurement, Development, Compensation, Integration

i) How do you define job

A job may be defined as a regular assignment to individual employee involving a set of duties, responsibilities and conditions entirely different from those of other assignments.

j) List any two types of wage incentive plans

- Straight Piece Rate Plan
- Taylor's differential piece rate system:
- Gantt task and bonus plan
- Halsey incentive plan

k) What is the need of training for enterprises?

In order to motivate and assist the prospective entrepreneurs for the success of their industry, proper training is essential in production techniques, management, marketing and other aspects. Small industries service institutes and their extension centres organise training for

1. Improving technical skills of workers and employees
2. Providing acquaintance to entrepreneurs with modern and latest production and management techniques.

l) Define entrepreneur?

A person, who takes responsibility for a business project, organizes the resources it requires, and assumes the risk it entails.

2. a) **Importance of management**

4M

1. **It helps in Achieving Group Goals** - It arranges the factors of production, assembles and organizes the resources, integrates the resources in effective manner to achieve goals. It directs group efforts towards achievement of pre-determined goals. By defining objective of organization clearly there would be no wastage of time, money and effort. Management converts disorganized resources of men, machines, money etc. into useful enterprise. These resources are coordinated, directed and controlled in such a manner that enterprise work towards attainment of goals.

2. **Optimum Utilization of Resources** -Management utilizes all the physical & human resources productively. This leads to efficacy in management. Management provides maximum utilization of scarce resources by selecting its best possible alternate use in industry from out of various uses. It makes use of experts, professional and these services leads to use of their skills, knowledge, and proper utilization and avoids wastage. If employees and machines are producing its maximum there is no under employment of any resources.
3. **Reduces Costs** - It gets maximum results through minimum input by proper planning and by using minimum input & getting maximum output. Management uses physical, human and financial resources in such a manner which results in best combination. This helps in cost reduction.
4. **Establishes Sound Organization** - No overlapping of efforts (smooth and coordinated functions). To establish sound organizational structure is one of the objective of management which is in tune with objective of organization and for fulfillment of this, it establishes effective authority & responsibility relationship i.e. who is accountable to whom, who can give instructions to whom, who are superiors & who are subordinates. Management fills up various positions with right persons, having right skills, training and qualification. All jobs should be cleared to everyone.
5. **Establishes Equilibrium** - It enables the organization to survive in changing environment. It keeps in touch with the changing environment. With the change is external environment, the initial co-ordination of organization must be changed. So it adapts organization to changing demand of market / changing needs of societies. It is responsible for growth and survival of organization.
6. **Essentials for Prosperity of Society** - Efficient management leads to better economical production which helps in turn to increase the welfare of people. Good management makes a difficult task easier by avoiding wastage of scarce resource. It improves standard of living. It increases the profit which is beneficial to business and society will get maximum output at minimum cost by creating employment opportunities which generate income in hands. Organization comes with new products and researches beneficial for society.

Are management and administration similar? Discuss

2M

Administration and management are not performed by different people. Both administration and management are performed by managers at all levels – top, middle and low. While managers at the top perform more of administration, those at lower level perform more of management. In fact, management can be administrative management (that deals with laying down policies) and operative management (that deals with execution of policies).

The administration includes the people who are either owners or partners of the firm. They usually contribute to the firm's capital and earn profits or returns on their investment. The main administrative function is handling the business aspects of the firm, such as finance. Other administrative functions usually include planning, organizing, staffing, directing, controlling and budgeting. Administration must integrate leadership and vision, to organize the people and resources, in order to achieve common goals and objectives for the organization.

Management usually incorporates the employees of the firm who use their skills for the firm in return for remuneration. Management is responsible for carrying out the strategies of the administration. Motivation is the key factor of a management. Management must motivate and handle the employees. It can be said that management is directly under the control of administration.

2. b) **CHOICE OF CHANNEL OF DISTRIBUTION:**

6M

While selecting a distribution channel, the entrepreneur should compare the costs, sales volume and profits expected from alternative channels of distribution. In order to select the right channel for distributing his product, a small-scale manufacturer should keep in mind the following considerations:

1. Market Considerations: The nature of the market is a key factor influencing the choice of channels of distribution. The following features of the market should be considered to determine the channels:

a. Consumer or industrial market: If the product is meant for industrial users, the channel of distribution will be a short one. This is because industrial users buy in a large quantity and the producer can easily establish a direct contact with them. But in case for goods meant for consumers, retailers may have to be included in the channels of distribution.

b. Number and location of buyers: When the number of potential customers is small or the market is geographically located in a limited area, direct selling is easy and economical. In case of large number of customers, use of wholesalers and retailers becomes necessary.

c. Size of order: Direct selling is convenient and economical where customers place order in big lots as in case of industrial goods. But where the product is sold in small quantities, middlemen are used to distribute such products. A manufacturer may use different channels for different types of buyers. He may sell directly to big retail stores and may use wholesalers to sell to small retailers.

d. Customers buying habits: The customer buying habits like the time he is willing to spend, the desire for credit, the preference of personal attention and one stop shopping significantly affect the choice of distribution channels.

2. Product Considerations: The type and nature of the product influence the number and type of middlemen to be chosen for distributing the product. The important factors with respect to the product are as follows:

a. Unit value: Products of low unit value and common use are generally sold through middlemen, as they cannot bear the cost of direct selling. On the other hand, expensive consumer goods and industrial products are sold directly by the producers.

b. Perishability: Perishable products like vegetables, fruits and bakery items have relatively short channels, as they cannot withstand repeated handling. Goods, which are subject to frequent changes in fashion and style, are generally distributed through short channels, as the producer has to maintain close and continuous touch with the market.

c. Bulk and weight: Heavy and bulky products are distributed directly to minimize handling costs. Coal, bricks, stones, etc., are some examples.

d. Standardisation: Custom-made and non-standardized products usually pass through short channels due to the need for direct contact between the producer and the consumers. Standardized and mass-made goods can be distributed through middlemen.

e. Technical nature: Industrial products requiring demonstration, installation and after sale service are often sold directly. The consumer products of technical nature are generally sold through retailers.

f. Product line: An entrepreneur producing a wide range of products may find it economical to set up its own retail outlets. On the other hand, firms with one or two products find it profitable to distribute through wholesalers and retailers.

g. Age of the product: A new product needs greater promotional effort and few middlemen may like to handle it. As the product gains acceptance in the market, more middlemen may be employed for its distribution.

3. Middlemen Considerations: The cost and efficiency of distribution depend largely upon the nature and type of middlemen as given in the following factors:

a. Availability: When middlemen as desired are not available, an entrepreneur may have to establish his own distribution network. Non-availability of middlemen may arise when they are handling competitive products, as they do not like to handle more brands.

b. Attitudes: Middlemen who do not like a firm's marketing policies may refuse to handle its products. For instance, some wholesalers and retailers demand sole selling rights or a guarantee against fall in prices.

c. Services: Use of those middlemen is profitable who provide financing, storage, promotion and after sale services.

d. Sale Potential: An entrepreneur generally prefers a dealer who offers the greatest potential volume of sales.

e. Costs: Choice of a channel should be made after comparing the costs of distribution through alternative channels.

3. a)

6M

Although most companies build organizational charts that outline personnel, titles and a clear hierarchy of who reports to who, an organizational chart is not the same as organizational structure. Org charts rely on people and the positions they fill, and can frequently change. On the other hand, organizational structure is based on a company's vision and long-term goals, and is much more likely to be considered "set" once it's built. If changes do occur, they are likely to be the result of a new mission, a rebrand or another major shift within an organization. They are, therefore, not taken lightly. Sound organizational structure is vital to all facets of a successful business.

1. A good organizational structure facilitates attainment of objectives through proper coordination of all activities:

It has a built-in system of "checks and balances" so that the progress towards the attainment of objectives is evaluated along the way so that any required adjustments can be made and any new decisions required can be taken.

2. In a good organizational structure, the conflicts between individuals over jurisdiction are kept to a minimum:

Since each person is assigned a particular job to perform, the responsibility of performing that job rests solely with him. It results in traceability of outcomes and the work interdependency of that particular task is reduced to a minimum.

3. It eliminates overlapping and duplication of work:

Duplication exists when work distribution is not clearly identified and the work is performed in a haphazard and disorganized way. Since a good organizational structure requires that the duties be clearly defined and assigned, such duplication of work is eliminated.

4. It decreases likelihood of "runarounds:"

The runarounds occur when we do not know who is responsible for what and we are not sent to the right people in the first instance for getting some work done. However, in a well organized company where the responsibilities are clearly established, this does not occur.

5. It facilitates promotions of personnel:

Since the organizational chart clearly pinpoints the positions of individuals relative to one another, it is easier to know as to which level a person has reached at any given time in the organizational hierarchy. Furthermore since each job is well described in terms of qualifications and duties, the promotional stages can be more clearly established.

6. It aids in wage and salary administration:

A fair and equitable wage and salary schedule is based upon the premise that the jobs with similar requirements should have similar benefits. If these requirements are clearly established and the yearly increments or the cost of living increments for each type of job are properly and clearly understood, then compensation administration policies are easier to implement.

7. Communication is easier at all levels of organizational hierarchy:

Since the lines of communication and flow of authority are clearly identified on the organizational chart, the intercommunication is both clearer and easier and it eliminates ambiguity.

8. A well-structured organization provides a sound basis for effective planning:

Since the goals are clearly established and resources clearly identified, both short term as well as strategic planning becomes more focused and realistic and such planning contains the provision to permit changes to be made in the right direction including expansion and contraction of facilities, operations and activities when it becomes necessary.

9. It results in increased cooperation and a sense of pride among members of the organization:

An employee is given sufficient freedom within the domain of his responsibility and his authority. Since the authority and the extent of exercise of such authority is known, it develops a sense of independence among employees which in turn is highly morale boosting.

10. It encourages creativity:

Because of a sense of belonging and high morale that a well-structured organization develops among employees and also because of clear-cut accountability, recognition of skill and appreciation for their contribution towards organizational growth, the employees develop their own initiative and a spirit of innovation and creativity.

3. b) Henry Fayol Principles of Management

6M

Management principles are statements of fundamental truth. These principles serve as guidelines for decisions and actions of managers. They are derived through observation and analysis of events which managers have to face in practice.

1. Division of Work

The specialization of the workforce, creating specific personal and professional development within the labour force and therefore increasing productivity; leads to specialization which increases the efficiency of labour. By separating a small part of work, the workers speed and accuracy in its performance increases. This principle is applicable to both technical as well as managerial work.

2. Authority and Responsibility

The issue of commands followed by responsibility for their consequences. Authority means the right of a superior to give order to his subordinates; responsibility means obligation for performance. This principle suggests that there must be parity between authority and responsibility.. They are co-existent and go together, and are two sides of the same coin.

3. Discipline

Discipline refers to obedience, proper conduct in relation to others, respect of authority, etc. It is essential for the smooth functioning of all organizations.

4. Unity of Command

This principle states that every subordinate should receive orders and be accountable to one and only one superior. If an employee receives orders from more than one superior, it is likely to create confusion and conflict.

Unity of Command also makes it easier to fix responsibility for mistakes.

5. Unity of Direction

All those working in the same line of activity must understand and pursue the same objectives. All related activities should be put under one group, there should be one plan of action for them, and they should be under the control of one manager.

It seeks to ensure unity of action, focusing of efforts and coordination of strength.

6. Subordination of Individual Interest

The management must put aside personal considerations and put company objectives first. Therefore the interests of goals of the organization must prevail over the personal interests of individuals.

7. Remuneration

Workers must be paid sufficiently as this is a chief motivation of employees and therefore greatly influences productivity. The quantum and methods of remuneration payable should be fair, reasonable and rewarding of effort.

8. The Degree of Centralization

The amount of power wielded with the central management depends on company size. Centralization implies the concentration of decision making authority at the top management. Sharing of authority with lower levels is called decentralization. The organization should strive to achieve a proper balance.

9. Scalar Chain

Scalar Chain refers to the chain of superiors ranging from top management to the lowest rank. The principle suggests that there should be a clear line of authority from top to bottom linking all managers at all levels. It is considered a chain of command. It involves a concept called a "gang plank" using which a subordinate may contact a superior or his superior in case of an emergency, defying the hierarchy of control. However the immediate superiors must be informed about the matter

10. Order

Social order ensures the fluid operation of a company through authoritative procedure. Material order ensures safety and efficiency in the workplace.

11. Equity

Employees must be treated kindly, and justice must be enacted to ensure a just workplace. Managers should be fair and impartial when dealing with employees.

12. Stability of Tenure of Personnel

The period of service should not be too short and employees should not be moved from positions frequently. An employee cannot render useful service if he is removed before he becomes accustomed to the work assigned to him.

13. Initiative

Using the initiative of employees can add strength and new ideas to an organization. Initiative on the part of employees is a source of strength for the organization because it provides new and better ideas. Employees are likely to take greater interest in the functioning of the organization.

14. Esprit de Corps

This refers to the need of managers to ensure and develop morale in the workplace; individually and communally. Team spirit helps develop an atmosphere of mutual trust and understanding.

These can be used to initiate and aid the processes of change, organization, decision making, skill management and the overall view of the management function.

Fayol also divided the management function into five key roles:

- To organise
- To plan and forecast (Prevoyance)
- To command
- To control
- To coordinate

4. a) **Method Study**

2M

Method study is the systematic recording and critical examination of existing and proposed ways of doing work as a means of developing and applying easier and more effective methods and reducing costs”

From the definition it is clear that method study is concerned with the development of efficient and economical work methods. Proper development of these methods calls for the co-operative efforts of the design engineer, process engineer, and method analyst. There is a continuing need for analyzing existing methods even in the case in which special efforts are made to develop efficient original work method.

The basic procedure for method study, selecting the proper steps, is as given below: 4M

1. **SELECT** the work to be studied
2. **RECORD** all the relevant facts about the present method by direct observation
3. **EXAMINE** those facts critically and in an ordered sequence, using the techniques best suited to the purpose.
4. **DEVELOP** the most practical, economic and effective method, having due regard to all contingent circumstances
5. **DEFINE** the new method so that it can always be identified
6. **INSTALL** that method as standard practice
7. **MAINTAIN** that standard practice by regular routine checks.

These are the seven essential stages in the application of method study; none can be excluded. Strict adherence to their sequence, as well as to their content, is essential for the success of an investigation.

4. b) **METHODS TO MEASURE PRODUCTIVITY**

6M

Productivity is an effective tool of judging how a system is performing over a period of time. It is important to measure it quantitatively and the following techniques are used to measure the productivity.

1. MATERIAL PRODUCTIVITY:

There are many industries in which the cost of raw material is in appreciable proportion of cost of finished product. Under such conditions, the productivity of materials becomes a key factor in economic production.

$$\text{Material productivity} = \frac{\text{output}}{\text{Material input}}$$

Raw material productivity can be improved by:

1. Changes in product design
2. Proper training and motivation of workers
3. Better material planning and control
4. Waste reduction and scrap control
5. Search for alternative cheaper materials

2. LABOUR PRODUCTIVITY:

$$\text{Labour or human productivity} = \frac{\text{output}}{\text{Human input}}$$

Output and labour can also be measured in terms of their money value

$$\text{Thus labour productivity} = \frac{\text{Total revenue from production}}{\text{Expenditure on labour}}$$

Labour productivity can be improved by:

1. Providing training to workers to utilize best methods of production.
2. Selection of product design and process of manufacture so as to ensure most economic use of labour
3. Constant motivation of workers by financial and non financial incentives
4. By boosting the morale of employees
5. Improving working conditions in the plant

3. CAPITAL PRODUCTIVITY:

$$\text{Capital productivity} = \frac{\text{Turnover}}{\text{Capital input}}$$

It can be improved by:

1. by careful make or buy decisions
2. Better utilization of capital resources like land, building and machines
3. by adopting modern manufacturing techniques, like flexible manufacturing system, Improved techniques of maintenance and proper plant layout.

4. MACHINE PRODUCTIVITY:

$$\text{Machine productivity} = \frac{\text{output}}{\text{Actual machine hours used}}$$

Machine productivity can be increased by:

1. Preventive maintenance
2. Utilization of proper machining parameters like speed, feed etc
3. Use of requisite skilled and properly trained labour
4. Method study

5. ENERGY PRODUCTIVITY:

$$\text{Energy productivity} = \frac{\text{output}}{\text{Energy input}}$$

5. a) Work measurement

2M

Work measurement refer to the estimation of standard time, that is the time allowed for completing one piece of job using the given method. This is the time taken by an average experienced worker for the job with provisions for delays beyond the workers control.

There are several techniques used for estimation of standard time in industry. These include time study, work sampling, standard data, and predetermined time systems.

Standard time determination procedure

4M

Step 1: Define objective of the study. This involves statement of the use of the result, the precision desired, and the required level of confidence in the estimated time standards.

Step 2: Analyse the operation to determine whether standard method and conditions exist and whether the operator is properly trained. If need is felt for method study or further training of operator, the same may be completed before starting the time study.

Step 3: Select Operator to be studied if there is more than one operator doing the same task.

Step 4: Record information about the standard method, operation, operator, product, equipment, quality and conditions.

Step 5: Divide the operation into reasonably small elements.

Step 6: Time the operator for each of the elements. Record the data for a few number of cycles. Use the data to estimate the total numbers of observations to be taken.

Step 7: Collect and record the data of required number of cycles by timing and rating the operator.

Step 8: For each element **calculate** the representative watch time. Multiply it by the rating factor to get normal time.

Normal time = Observed time * Rating factor

Add the normal time of various elements to obtain the normal time for the whole operation.

Step 9: Determine allowances for various delays from the company's policy book or by conducting an independent study.

Step 10: Determine standard time by adding allowances to the normal time of operation.

Standard time = Normal time + allowances

5. b) Factors Affecting Productivity

6M

1. Man Power:

Selection i.e. selection of right man for a specific job Applying well known saying division of labour. Training i.e. consideration of training requirements whether to be imparted training in the plant itself or to be sent for training outside the unit to other plants within the country or abroad or training institutes. Number of personnel required i.e. man power requirement planning in each of the departments of required skill.

2. Equipment and Machines:

The number of machine tools, their capacity and accessories required, replacement policy of the organization and maintenance schedules etc.

3. Input Materials:

- i. Appropriate quality of materials
- ii. Material requirement planning (M.R.P.)
- iii. Substitute of materials being used
- iv. Inspection of input materials at various points
- v. Cost of materials procurement and handling up to stores.

4. Time:

Time is significant for the following reasons:

- i. Inspection of input materials i.e. raw material and semi finished or finished items required for assembly.
- ii. Time for inspection of finished products.

- iii. Production time (total time of manufacturing).
- iv. Time for repair and maintenance of machines and equipment.

5. Floor Area or Space:

- i. Total area covered by the administrative block, production shop and inspection & quality control departments etc.
- ii. Location of different departments and shops etc.
- iii. Other space covered by plant layout.

6. Power or Energy:

- i. Maintenance of equipment for saving energy
- ii. Use of renewable energy devices
- iii. Use of biogas, photovoltaic cells, solar energy and other non conventional techniques.

7. Finance:

Finance is required to maintain all the above requirements. The management should be for minimum rather optimum finance.

8. Movement of Man and Materials:

- i. The required motion of manpower within the plant
- ii. The motion of raw material semi finished and finished products/items within the plant.

6. a)

Acceptance sampling is an inspection procedure used to determine whether to accept or reject a specific quantity of material. 1M

Double-Sampling Plan 5M

In a **double-sampling plan**, management specifies two sample sizes (n_1 and n_2) and two acceptance numbers (c_1 and c_2). If the quality of the lot is very good or very bad, the consumer can make a decision to accept or reject the lot on the basis of the first sample, which is smaller than in the single-sampling plan. To use the plan, the consumer takes a random sample of size n_1 . If the number of defects is less than or equal to (c_1), the consumer accepts the lot. If the number of defects is greater than (c_2), the consumer rejects the lot. If the number of defects is between c_1 and c_2 , the consumer takes a second sample of size n_2 . If the combined number of defects in the two samples is less than or equal to c_2 , the consumer accepts the lot. Otherwise, it is rejected. A double-sampling plan can significantly reduce the costs of inspection relative to a single-sampling plan for lots with a very low or very high proportion defective because a decision can be made after taking the first sample. However, if the decision requires two samples, the sampling costs can be greater than those for the single-sampling plan.

6. b) Functions of Human Resource Management (HRM):

3M

Broadly speaking, experts have generally classified the functions into two major categories, i.e. managerial and operative functions. Others has classified functions as general and specific functions, and yet others as 'personnel Administration functions and Industrial Relations Functions'. Functions have also been classified on the basis of the capacities; or on the basis of authority.

Managerial functions:

“Management is a multi-purpose organ which has these jobs, two of which are directly related to personnel managing a business. ‘Managing managers’ and managing workers and the work.

In our view management may be thought of as the process of allocating an organizations inputs (human and economic resources) by planning, organizing, directing and controlling for the purpose of producing outputs (goods and services) desired by its customers so that organization objectives are accomplished. In the personnel in an ever-changing business environment. Definition is very dynamic.

Planning: Is a pre-determined course of action. According to Allen, “it is a trap laid to capture the future.” Terry is of the view the “planning is the foundation of most successful actions of an enterprise.” Planning is the determination of the plus, strategies, programs, policies, procedures, and standard needs to accomplish the desired organization objectives. In fact “planning today avoids crisis tomorrow.’ They bridge a gap between where they are and where they want to go.

Organizing: After a course of action has been determined an organization should be established to carry it out. An organization is a structure, a framework and a process by which a cooperative group of human beings allocate its tasks among its members, identifies relationships and integrates its activities towards common objectives.

Directing (Motivating, Actuating or commanding): Directing the subordinates at any level is a basic function of the managerial personnel. Directing is involved with getting persons together and asking them (either through command or motivation) to work willingly and effectively for the achievement of designated goals. Directing deals not only with the dissemination of orders within an organization units and departments, but also with the acceptance and execution of these orders by the employees.

Coordinating and controlling: Coordinating refers to balancing timing and integrating activities in an organization. So that a unity of action in pursuit of a common purpose in achieved. Coordination in the management of personnel takes place at all levels, from the top management through to the supervisor and those for whom he is responsible.

The personnel dept has to coordinate the tasks of developing, interpreting, and reviewing personnel policies, practices and programs, such as safety programs, employee benefits, job evaluation, training or development, and communication.

Controlling is the art of checking regulating and verifying whether everything occurs in conformity with the plan that has been adopted, the instructions issued and the principles established. It is greatly concerned with actions and remedial actions. By check, analysis, and review, the personnel dept assists in realizing the personnel objectives.

Operative functions:

3M

The operating functions of personnel management are concerned with the activities specifically dealing with procuring, developing, compensating and maintaining an efficient workforce.

1. **The procurement** is concerned with the obtaining of a proper kind and number of personnel necessary to accomplish an organization's goals. It deals with specifically with such subjects as the determination of manpower requirements their recruitment, selection and place (comprising activities to screen and hire personnel, including application forms, psychological test, interviews, medical check-up reference calling), induction follow up, transfers, layoffs, discharge and separation etc.

2. **The development** is concerned with the personnel development of employees by increasing their skill through training so that job performance is properly achieved. Drafting and directing training programmes for all levels of employees, arranging for their on-the-job, office and vestibule training, holding seminar and conferences providing for educational and

Vocational counseling and appraising employee potential and performance are undertaken under this function.

3. **The compensating** is concerned with securing adequate and equitable remuneration to personnel for their contribution to the attainment of original objectives. Functions related to wage surveys, establishment of

Job classifications, job descriptions and job analyses, merit ratings, the establishment of wage rates and wage structure, wage plans and policies, wage system, incentives and profit sharing plans etc. fall under this category.

4. **The integration function:** after the employee has been procured, his skill and ability developed and monetary compensation determined, the most important,

Yet difficult of the personal management is to bring about an "integration" of human resources with organization, and to cope with inevitable reconciliation of individual, societal, and organization interests. It rests upon the premise that significant overlapping of interests do exist in the organization in such programmes as job enlargement, job evaluation, variable compensation plans. The greater they overlap, the more productivity would coincide with employees that they would prefer to avoid assignment to narrow and respective tasks, meeting high output standards, acceptance of managerial decisions. For this reason, the organization has disciplinary action programmes as well as some freedom to do away with the services of particular employees. On the other hand, there are certain things that employees desire which the organization is reluctant to provide e.g. increased wages; totally, safe working conditions time off with pay, shorter hours of work, premium pay for overtime work etc.

5. **The maintenance function** deals with sustaining and improving the conditions that have become established. Specific problems of maintaining the physical conditions of employees (health and safety measures) and employee service programmes are the responsibility of the personnel department.

7. a) **Methods of job evaluation:**

6M

a) Non-quantitative methods

1. Ranking method

2. Classification method
- b) Quantitative methods
 1. Factor comparison method
 2. The point rating method

1. Ranking method

This is the easiest and simplest method of job evaluation. In this method the jobs are ranked from the most important one to the least important. Each departmental head arranges the jobs in their department in the order of importance. The individual departments pass on their ranking to a central committee who groups the jobs into grades/classes.

While ranking, following points are considered:

1. Amount of work involved
2. Supervision needed
3. Extent of responsibility required
4. Difficulties involved in the work
5. Monotony of work
6. Working conditions required
7. Knowledge and experience needed

2. Classification method

In this method jobs are classified or graded in groups or levels of equal skill, difficulty, responsibility, importance and other requirements. It may be production job, a sales job or an office job, each job family can be broken into a number of grades. For example, production jobs may be classified into five grades, namely grade 1 to grade 5. Grade 1 involves simple tasks requiring less skill, precision and accuracy while grade 5 involves skilled, precise and highly accurate work.

The job evaluation by job classification involves following major steps:

1. Deciding the number of grades(five, six etc)
2. Writing grade level descriptions
3. Identifying/listing of the jobs to be evaluated
4. Preparing job descriptions
5. Comparing job descriptions with grade level descriptions and assigning jobs to grades

3. Factor comparison method

In this method detailed analysis of the jobs is carried out by employing following five main factors:

1. Skill
2. Mental effort
3. Physical effort
4. Responsibilities

5. Working conditions

The various steps involved in the factor comparison method are:

1. Identify a few key jobs in the organization which can be described accurately and assumed to be correctly paid
2. Analyse the key jobs for each of the five factors mentioned above
3. The salary paid for each key job is amongst the factors in proportion to their importance in the job
4. This provides a money rating scale for each of the factors
5. Each of the remaining jobs is evaluated for each of the factors on its money rating scale of the key jobs. The monetary value of the job is obtained by adding up the individual money values assigned to the job for each of the factors depending upon their importance in the job.

		Factors				
Key job	Salary	Skill	Mental effort	Physical effort	Responsibility	Working conditions
J1	1300	240	100	200	600	160
J2	1640	500	100	600	200	240
J3	2160	400	750	140	800	120
J4	2500	540	380	900	320	360
J5	3200	800	400	200	1100	700
X	Job to be evaluated	200	160	240	500	300

4. Point method

The point system a widely used method is based on dividing the jobs into a number of factors which in turn are further subdivided into grades or degrees. Certain points (weightage) is assigned to each grade.(for example, effort is one of the factors which may be subdivided in two grades-physical and mental) when such points for all the factors are added they indicate the importance of the job in the organization. The points or weightage assigned to each factor will vary from industry to industry. Point method involves the following major steps:

- a) Decide the type of jobs to be evaluated
- b) Select and define job factors which may vary from five to ten.

A few job factors commonly selected are as given below

1. Skill
 - a) Education and training
 - b) Experience
 - c) Judgement and initiative
2. Effort

- a) Physical
- b) Mental
- 3. Responsibility towards
 - a) Materials or product
 - b) Equipment or process
 - c) Safety of others
 - d) Work of others
- 4. Working conditions
 - a) Exposure to hazards
 - b) Dust, smoke, fumes and noise
 - c) High temperature
 - d) Glares and harmful radiations

While selecting the factors it should be noted that:

1. The factors selected must be rateable. For example, education is a rateable factor as it can be specified in varying degrees such as middle school, trade certificate, graduation, postgraduation etc
2. The number of factors should be as few as possible
3. Only important factors should be selected factors which are present to the same degree in all jobs should not be selected
4. Each factor should measure only one aspect of the job

Select and define grades or degrees to each factor. For example, education and training may have the following factors:

1. Diploma in engineering with no training
2. Diploma in engineering with 2 years apprentice training
3. Diploma in engineering with 2 years training in machine shop and certificate course in computer applications

Diploma in engineering A.M.I.E and 2 years experience

7. b) **Wage incentive Plans**

6M

Straight Piece Rate Plan- If the standard time for a particular job/ operation is 1 hour, the production per shift/day of eight hours will be eight pieces. Decide average earnings per day to perform the job requiring particular skill, education & experience. Say it is Rs 100. Now the piece rate for the job will be $\text{Rs. } 100/8 = \text{Rs. } 12.5$. If a worker has produced 9 pieces, his earning for that day will be $12.5 \times 9 = \text{Rs. } 112.5$. On the other hand, if he has produced only 7 pieces his earning will be $12.5 \times 7 = \text{Rs. } 87.5$.

This scheme is very easy to follow. The increase in production is rapid. Minimum wages are not guaranteed, so it is the prime responsibility of management to provide sufficient materials, tools, power, machines & equipment.

Advantages:

1. It provides direct incentive for increased output
2. It is easy to understand and calculate

Taylor's differential piece rate system: This system was introduced by Taylor, the father of scientific management. This system introduced to penalize a slow worker by paying him a low piece rate for low production and to reward an efficient worker by giving him a higher piece rate for a higher production.

Thus if a worker completes the work within or less than the standard time, he is paid a higher piece rate and if he does not complete the work within the standard time, he is given a lower piece rate

Advantages:

1. The system is easy to understand
2. It provides greater incentive to efficient workers and penalizes the inefficient ones
3. The worker is not required to be paid for idle time

8. a) **Entrepreneurial development:**

6M

Entrepreneurial development is must for the economic development. For the purpose of entrepreneurial development rapid growth of small scale sector is required. Further more entrepreneurial development programmes are designed to help an individual in strengthening his entrepreneurial motive and in acquiring skills and capabilities essential for playing his role effectively.

The main goal of the entrepreneurial development programme is to motivate and assist potential and prospective entrepreneurs to establish small scale units of their own to acquire self employment and contribute significantly towards production and employment situation.

8. b) **Functions of an Entrepreneur:**

6M

1. He manages business and takes decisions
2. He studies the market and selects the business
3. He makes a selection of plant size
4. He selects plant site
5. He organizes sales and holds the customers
6. He promotes new inventions
7. He coordinates different factors of production
8. He arranges raw material, machinery and finance
9. He employs laborers
10. He deals with government departments such as sales tax, labour, electricity, export-import, railways.
11. He decides pricing policies
12. He Distributes wages of labourers, interest to the capitalist.

Market Potential: First of all it should be looked that product will satisfy a demand in the market and it is both desirable and acceptable. Otherwise if no consumption is envisaged or shorter product life cycle is envisaged, there is no point in producing the product. Sometimes marketing division has to make special efforts to create demand and make product acceptable to the customers through sales promotion schemes.

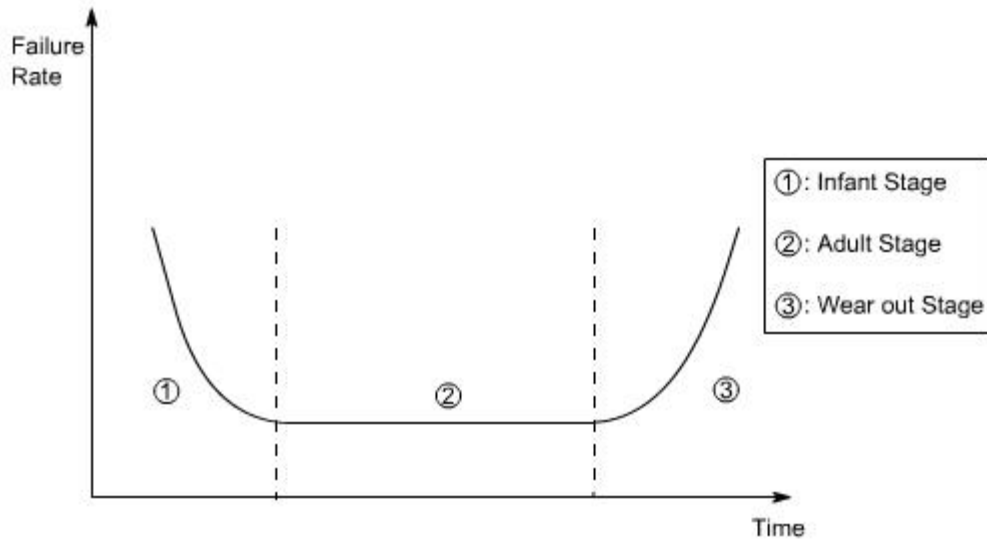
Competition: If company is entering a mature market, it has to face stiff competition from other manufacturers who are already established and in touch with the customers. Thus management has to analyze its capabilities carefully before formulating their own marketing strategy and positioning of its product. It is also important to mention that the functionality, quality and cost of the products offered by the competitors should also be analyzed.

Customer Needs: Basic aim of a product is to satisfy customer needs. As different customers have different needs (in terms of cost, functions, colors etc.), it is very difficult to satisfy all their needs in many situations. A balancing act between customer needs and product cost is utmost important particularly in a mature market.

Functional Aspect: After market research, the functional scope of the product has to be carefully analyzed and properly defined. Functions can be divided into three main categories viz., primary function, secondary functions, and tertiary functions. For a washing machine 'to wash clothing' is the primary function. Secondary and tertiary functions may include: level of automation, rinsing or drying or both, heating of water prior to washing etc. A functional analysis to see that most of the customer requirements are satisfied within their buying capacity is important during product design and development and affects the design of product, its complexity, its appearance and its price.

Operational Aspect: It is related with the ease of operation of the product. It must be easy to handle and simple to operate. Its operational efficiency should not be affected by the varying operating conditions and varying operator skills. In many situations, operational efficiency of a product can be improved by providing supporting literature in the form of operation guidelines or by providing on hand training to the first time users.

Durability and Dependability: These two factors often determine quality of a product. Durability is defined by the length of active life of the product under given working conditions. Dependability is the capability of the product to function when called upon to do its job. Both durability and dependability are related to the selection of materials and the class of workmanship. Durability of a product can be shown by a bath tub curve. It can be observed that during infant stage, product is new and may have some design or manufacturing defects leading to higher rate of failure. During adult stage, product is put under use after all necessary testing and thus the rate of failure is stabilized and is fairly low. Similarly in wear out stage, product has completed its useful life and due to wear and tear in its components, failure rate starts increasing again.



9. b) Barriers to entrepreneurship

6M

1. Environmental Barriers

- Non availability of raw materials
- Lack of skilled labour
- Lack of good machinery
- Lack of infrastructure
- Lack of fund
- Other environmental barriers

2. Personal barriers

- Unwilling to invest money
- Lack of confidence
- Lack of motivation
- Lack of patience
- Inability to dream

3. Social barriers

- Law status
- Custom and tradition of people