REVISIONARY TEST PAPER

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FOUNDATION
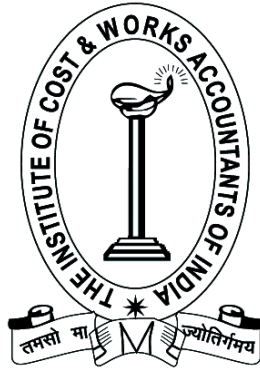
FOUNDATON EXAMINATION

(REVISED SYLLABUS - 2008)

Paper - 1 : ORGANIZATION & MANAGEMENT FUNDAMENTALS

Q. 1. Define the following, in just one or two sentence.

   (a) Organization

   (b) Pure Line Organization

   (c) Departmental Line Organization

Answer 1. (a)

An Organization is a consciously coordinated social unit, composed of two or more people what functions of a relatively continuous basis to achieve a common goal or set of goals.

Answer 1. (b)

All individuals at a given level perform the same type of work and departments are created only to facilitate supervision and control.

Answer 1. (c)

In department line organization work performed in each department is of a different nature.

Q. 2. Define Line Organizations. State its advantages and disadvantages.

Answer 2.

Line Organization is the oldest type of organization structure. It is also known as military or 'Scalar' organization because it originated in the army. In line organization there is an unbroken vertical line through which authority flows from the top to the bottom of organization. Every managers exercises direct authority over his subordinates who are in turn directly responsible to their superior. There is thus a hierarchical arrangement of authority .There are no separate supportive or service units for accounting,labour etc. Every manager is required to incorporate these activities in his department.

There are two types of Line Organization viz. Pure Line Organization and Departmental line organization.

Characteristics :

Line organization has the following characteristics **:**

   (i) Lines of authority are vertical flowing from top to the bottom.

  (ii) The command is through a straight and unbroken line. Each subordinate receives orders from one superior and is responsible to him.

 (iii) All person at the same level are independent of each other.

 (iv) The authority and responsibility of each position is clearly specified.

Advantages :

Line organization has the following advantages :

(A) **Simplicity** – Line organization is the most simple to establish and operate. Lines of authority and responsibility are direct, simple and clear. Every individual understands to whom he is responsible. The authority and responsibility of every person is clearly defined.

(B) **Prompt decision**-Every manager can take decisions independently without consulting others. He has not to depend upon others for advice, assistance and service. Therefore decision making process is easier and less time- consuming.

(C) **Effective discipline** – each position is under the direct control of its immediate superior position. Therefore, it is to maintain discipline among the people in the organization.

(D) **Orderly Communication**-Communication between superiors and subordinates flows in a direct vertical line. Such communication is easy to maintain and it is orderly in nature. It supports the authority of the superior.

(E) **Unified control**- Unity of command results in close personal contacts between superiors and subordinates. Direct and close contacts facilitate effective supervision and control.

(F) **Economical**-Line organization is quite economical because staff specialists are not required.

(G) **Fixed responsibility**-Every manager can be held responsible for the results of his unit.

(H) **Coordination**-As all activities relating to one department are managed by one person, co-ordination can be effective.

Disadvantages :

Line organization suffers from the following disadvantages :

(A) **Lack of specialization** - There is no scope for specialization. A manager has to perform a variety of functions which might not be interrelated. Every manager cannot be equally good in all the functions and, therefore, the quality of management tends to be poor.

(B) **Overloading** - As managers are overloaded with day-to-day work, they do not find time for innovations and creativity and independent thinking.

(C) **Autocratic approach** - The line of authority is direct and requires high level of obedience on the part of subordinates. There is concentration of authority at the top and one way communicaition. Managers at the top may be devoid of the realities of the situation. As a result decisions may be arbitrary. There is scope for favoritism.

(D) **Low morale** - Subordinates are expected to carry out the decisions taken by superior. There may be lack of initiative at the part of subordinates. Their opinions and grievances are not properly communicated upward.

(E) **Instability** - The success and the continuity of the organization depend upon a few competent managers. Succession problem is acute and there may be lack of continuity when key executives retire.

(F) **Rigidity** - Discipline is emphasized so much that it may be difficult to change.

Q. 3. What do understand by Matrix Organization?

Answer 3.

The matrix structure sometimes referred to as a "multiple command system" is a hybrid that attempts to combine the benefits of both types of designs while avoiding their drawbacks. An organization with a matrix structure has two types of structure existing simultaneously. Employees have in effect two bosses-

that is they work in two chains of command. One chain of command is functional or divisional, the type diagrammed vertically in the following charts. The second is a horizontal overlay that combines people from various divisions or functional departments into a project or business team led by a project or group manager who is an expert in the team's assigned area of specialization.

As organizations have become more global, many use a type of matrix form in their international operations. There may be product or division managers, as in a divisionalised firm, as well as national managers for each country in which the company does business. Thus a division employee would report to the divisional manager on product related issues and to the national manager on political issues or those involving international relations.

Although matrix organizational structures are necessarily complex, they have advantages.

(i) Often the matrix structure is an efficient means for bringing together the diverse specialized skills required to solve a problem.

(ii) Problems of coordination-which plague most functional designs are minimized here because the most important personnel for a project work together as a group. This is itself produces a side benefits: By working together, people come to understand the demands faced by those who have different areas of responsibility. A report from AT&T Bell Labs for example indicated that systems engineers and systems developers overcame their preconceptions about each other jobs and acquired more realistic attitude about each other after working together as project team. (This was not, however, in a pure matrix structure). Indeed the interaction was so effective in stimulating interest in each others work that some system developers decided to move into full time systems engineering.

(iii) Another advantage of the matrix structure is that it gives the organization a great deal off cost saving flexibility. Because each project is assigned only the number of people it needs , unnecessary duplication is avoided.

A disadvantage is that not everyone adapts well to a matrix system.

(i) To be effective, team members must have interpersonal skills and be flexible and co-operative.

(ii) In addition, morale can be adversely affected when personnel are rearranged once projects are completed and new ones are begun.

(iii) Finally if hierarchies are not firmly established and effectively communicated, there is the danger, according to some analysts, that conflicting directives and ill-defined responsibilities will tie managers hands.

To overcome these obstacles, special training in new job skills or interpersonal relationships may be necessary when a matrix overlay is first introduced or when a temporary overlay becomes permanent. To protect individuals who function well in traditional structures but are likely to have difficulty adjusting to a matrix structure, many companies either make special efforts to retain personnel before assigning them to project teams or select only volunteers for the teams.

Q. 4. Explain in brief the three levels of conflicts in any organization?

Answer 4.

There is frequent conflict and friction between the line executives and staff personnel. The causes of such conflict may be divided into three categories :

(A) Line managers make the following complaints against staff personnel :

(i) *Staff oversteps its authority* . Staff officers encroach upon line authority. They interfere in the work of line managers and attempt to tell them how to do their work. They do not confine themselves to their advisory role.

(ii) *Staff does not give sound advice*. Staff personnel fail to give fully considered, well balanced and sound advice. They are academicians and give new ideas that have little practical application. They are not well acquainted with the real problems of the enterprise. They often push untried and untested ideas.

(iii) *Staff steals credit*. Staff personnel are not directly accountable for results and are generally overjealous.They tend to assume credit for success but lay the blame for failure on line managers.

(iv) *Staff experts fail to see the whole picture objectively*. They tend to emphasize their speciality rather than the interest of the total organization.

(v) *Staff has a complex*. Staff officers tend to impose their superiority on line managers. Staff personnel are generally more qualified and specialist in their areas. Therefore, they consider themselves superior to the line executives.

(B) Staff personnel usually make the following compliants against the managers :

(i) *Line managers often resist* **new** ideas and are not prepared to listen to the arguments to the staff experts.

(ii) *Line executive do not provide sufficient authority*. Staff specialists lack authority to get their useful ideas implemented. As a result they get frustrated.

(iii) *Line managers do not make a proper use of their service of staff specialists* . Line managers consult them only as a last resort. They consider that asking for advice is admitting defeat. Therefore, staff cannot anticipate problems and recommend precautionary measures.

(C) The following weaknesses in the organization structure also lead to line –stiff conflict :

(i) *Lack of well defined authority*. Very often authority relationship between line and staff are not clearly defined. This results in overlapping and gaps in authority leading to conflicts.

(ii) *Temperamental differences*. These are fundamental differences in the orientation, viewpoints and perceptions of line and staff. Generally, staff people are relatively young, better educated and more sophisticated in their outlook. On the other hand, line personnel tend to be old, less educated and more conservative. Staff feels their advice will produce miracles while line feels it impracticable. Staff seeks change and experimentation whereas line often desires status quo and caution.

Q. 5. Discuss Delegation of Authority.

Answer 5.

The act of assigning formal authority and responsibility for completion of specific activities to a subordinate.

Tasks of Effective Delegation. The prerequisites just discusses are all important to carrying out the following tasks of effective delegation :

(i) *Decide which tasks can be delegated*. Many items can and should be delegated. Some of these are minor decisions and recurring chores.However, unusually demanding and challenging assignments may often be delegated to employees and will do much to develop them.

(ii) *Decide who should get the assignment*. Who has available time? Does the job require special competence? For whom would it be an appropriate and useful developmental experience? Managers ask these questions when deciding which of their people should get the assignment.

(iii) *Provide sufficient resources for carrying out the delegated task*. All the delegated authority in the world will not help the recipient, if he or she cannot have the financial, staff or resources necessary to do the job.

(iv) ***Delegate the assignment***. In delegating the assignment, effective managers provide all relevant information on the task. As far as possible they specify the results expected , not the methods to be used. Further, they cultivate a climate of free and open communication between themselves and the person to whom they delegated the task.

(v) ***Establish a feedback system***. Delegating managers establish a system of checkpoints and feedback so they will remain advised of progress and can offer advice or 'mid-course adjustments' if necessary. They select the feedback system carefully, bearing in mind that the tighter their controls, the less actual delegation is taking place.

Q. 6.   Discuss the Importance or benefits of delegation of authority.

Answer 6.

The importance of delegation of authority may be highlighted on the following lines :

(a) ***Vehicle for coordination*** . Delegation acts as a vehicles for coordination. By establishing structural relationships through out the organization, delegation results in securing coordination and company unity.

(b) ***Reduction of manager's burden***. Delegation reduces the burden of executives by relieving them of the botheration of taking routine decisions which others can take efficiently. This will help them in concentrating on vital aspect of management.

(c) ***Expansion of business***. Delegation facilitates the expansion of business through extending and multiplying the limited personal capacity of the superiors.

(d) ***Motivation***. Delegation improves the morale of subordinates by way of raising their status and importance in the organization. Subordinates are encouraged to take more initiative and turn out better work. Delegation of authority is a type of motivation.

(e) ***Specialization***. Delegation helps the organization in getting the benefits of specialized services of its personnel.

Q. 7.   State the difficulties or weakness of delegation of authority.

Answer 7.

(A) *On the part of the Superior* : Managerial failure in delegation arises because of he following **:-**

(i) There is a superiority complex among the supervisors (Superior).They feel that hey can do the job in a better way.

(ii) Superior sometimes do not have any faith in the subordinates. Lack of confidence in the capacity, ability and dependability of the subordinate obstructs the superior to delegate authority. Due to this, superior are unwilling to delegate their authority.

(iii) Sometimes the superiors do not have enough ability to direct the subordinates. They fail to guide the subordinates and this poses problems before the process of delegation of authority.

(iv) The desire of dominance over the work of subordinate at each step hampers the delegation. Hence superior would like to do everything by themselves. They will not like their subordinates to enjoy any power.

(v) If a superior is not competent, the procedures and methods deigned by him are likely to be faulty. For fear of exposure, he keeps all the authority to themselves.

(B) On the part of the subordinate :

Sometimes the subordinates may pose problems in the process of delegation, because of the following reasons :-

   (i) Subordinates are often unwilling to accept or utilize the delegated authority because they lack self confidence in their abilities.

  (ii) Some superior are in the habit of criticizing actions taken by the subordinate. This discourages initiative.They want to play safe by depending on their boss for all decision.

 (iii) Some subordinate have low need for autonomy and feel comfortable in the relationship of dependence with their superiors. They feel confused and a sense of loss of direction if they are entrusted with authority to make decisions.

 (iv) Subordinates may hesitate accept the delegated assignment, if they believe they lack necessary information and other infra-structure to perform it.

  (v) Subordinates may be shy of taking a delegated authority.

(C) On the part of Organization :

The fault contributing to be weakness of delegation may also lie with the organization. They may include the following :

   (i) Defective organization structure and non clarity of authority.

  (ii) Inadequate planning.

 (iii) Non implementation of principle of unity of command.

 (iv) Lack of effective control mechanism.

Q. 8. Write Short Note on :

   (i) Centralization.

   (ii) Decentralization.

Answer 8.

(i) Centralization :

The amount of authority and autonomy given to a multinational divisional manager is a reflection of the relative centralization or decentralization.

Al Winick, President of Norwest financial Information services Group, and Robert Major, President and CEO of Chrysler First have studied the advantages of both centralization and decentralization in the customer finance market.

Centralization offers a variety of strengths well studied to day's **customer finance market.** He lists the following as reasons for centralization :

   (i) Specialized skills, talent, and technology are sometimes neither affordable nor practical in multiple locations.

  (ii) Decentralized locations usually mean an increase in overhead and staff.

 (iii) Recent improvements in communication technology facilitate the movement of money, credit information, transportation, and data processing from a central location.

(ii) Decentralization :

Winick reports that decentralization is, in the opinion of many, "the best way to develop and retain a close relationship with the customer". He lists the following **benefits** of decentralization, inj relation to a finance market :

   (i) ***Proximity to the market***. Having the same person procure accounts, receives payments, and handle collections and renewals provides the customer with a more personalize level of service.

  (ii) ***Local Knowledge***. An employee's knowledge of the community can prove critical in the decision to grant a loan.

 (iii) ***Customer acceptance and Knowledge***. Local employees are also possed of a better understanding of a customers needs due to local economic trends.

 (iv) ***Dealer's Comfort***. *Dealer*'s also feel more comfortable doing business with the person who will be servicing the dealer's customers.

Factors influencing Decentralization.

Decentralization has value only to the extent it helps organization members achieve their objectives. In determining the amount of decentralization appropriate for an organization, the following factors are usually considered :

   (i) ***Environmental influences***, such as market characteristics, competitive pressures, and availability of materials.

  (ii) ***The organization's*** size and growth rate.

 (iii) ***Other characteristics of*** organization such as costliness of given decisions, top management preferences, the organization's culture, and abilities of lower-level managers.

Q. 9. Define Formal Organization. State its characteristics.

Answer 9.

Formal Organization – Formal organization refers to the organization structure deliberately created by management for achieving the objectives of the enterprise. It is a pattern of activities, processes, human relationships and roles planned and structured in order to accomplish organizational goals. It is a network of official authority responsibility relationships and communications flows. According to Chester Barnard, "Formal organization is a system of consciously coordinated activities of two or more persons towards a common objective".

Nature or Characteristics of Formal Organization :

   (i) **Common Purpose**. Every organization exists to accomplish some common goals. The structure must reflect these objectives as enterprise activities are derived from them. It is bound by common purpose.

  (ii) **Division of Labour**. The total work of an organization is divided into functions and subfunctions.This is necessary to avoid the waste of time, energy and resources which arises when people have to constantly change from one work to another. It also provides benefits of specialization.

 (iii) **Authority Structure**. There is an arrangement of positions into a graded series. The authority of every position is defined. It is subordinate to the position above it and superior to the one below it. This chain of superior-subordinate relationship is known as chain of command.

 (iv) **People.** An organization is basically group of persons. Therefore activity groupings and authority provisions must take into account the limitations and customs of people. People constitute the dynamic human element of an organization.

  (v) **Communication.** Every organization has its own channels of communication. Such channels are necessary for mutual understanding and cooperation among the members of an organization.

(vi) Coordination. There is a mechanism for coordinating different activities and parts of an organization so that it functions as an integrated whole. Cooperative effort is a basic feature of organization.

(vii) Environment. An organization functions in an environment comprising economic, social, political and legal factors. Therefore, the structure must be designed to work efficiently in a changing environment. It cannot be static or mechanistic.

Q. 10. (a) Discuss the Principles of Formal Organization.

(b) Write short note on Informal Organization.

Answer 10. (a)

The basic principles of formal organization are as follows :

(i) *Unity of objective*. An organization structure is sound when it facilitates the accomplishment of objectives. Therefore the organization as a whole and every part of must be geared to the basic objectives of the enterprise.

(ii) *Specialization or Division of work*. The activities of every member of the organization should be confined, as far as possible, to the performance of a single function.

(iii) *Span of Control*. Every manager should have a limited number of subordinates reporting to him directly. Generally the span should be narrow for complex work and wide for routine work. Span should be neither too wide nor too narrow.

(iv) *Scalar principle*. There should be a clear chain of command extending from top to the bottom of the organization. Every subordinates should know who his superior is and who his subordinates are.

(v) *Exception principle*. Only exceptional matters which are beyond the authority of lower level persons should be referred to higher levels. Routine matters should be dealt with by executives at lower levels. This is also known as authority level principle.

(vi) *Unity of command*. Each subordinated should have only one superior whose command he has to obey. This is necessary to ensure discipline and to fix responsibility for results.

(vii) *Flexibility*. The organization structure should be adaptable enough to accommodate technical and other changes in environment. Therefore complicated procedures, red tape and complexity of control should be avoided. At the same time, the organization structure should be reasonably stable so as to withstand changes.

(viii) *Continuity*. Paper arrangements should be made for the training and development of executives.

Answer 10. (b)

Informal Organization refers to the pattern of activities, interactions and human relationships which emerge spontaneously due to social and psychological forces operating at the work place. It arises naturally on the basis of friendship or some common interest which may or may not be related with work. It is an unintended and non-planned network of unofficial and social patterns of human relationships. Informal organization represents the pattern of interpersonal and intergroup relations that develop within the formal organization,e.g friendship group and cliques.

Q. 11. Match with the following :

(a)	extroversion	(i)	Relaxed, Scure, Unworried
(b)	Openness to experience	(ii)	Trusting, Good natured, Cooperative, Soft-hearted.
(c)	Agreeableness	(iii)	Intellectual, Imaginative, Curious, Broad-Minded
(d)	Emotional Stability	(iv)	Outgoing, Talkative, Sociable, Assertive
(e)	Conscientiousness	(v)	Dependable, Responsible, Achievement-oriented and persistent.

Answer 11.

  (a) (iv)

  (b) (iii)

  (c) (ii)

  (d) (i)

  (e) (v)

Q. 12. Distinguish between Formal and Informal Organization

Answer 12.

The differences may be highlighted as follows :

Basis	Formal Organization	Informal Organization
Origin	Formal organization is created deliberately and consciously created by management.	Informal Organizational emerges spontaneously on account of socio-psychological forces operating at the workplace. People working together develop certain liking and disliking for each other.
Purpose	Formal organization is created for achieving the legitimate objectives of the organization.	Informal organization is created by the members of the organization for their social and psychological satisfaction
Size	It may be quite large in size particularly when these groups are constituted to give representation to various interest groups.	Informal groups tend to be small in size so as to maintain groups cohesiveness.
Nature of groups	Formal groups are stable and may continue for a very long period. They tend to disappear or cease to be attractive for members when changes take place in personal liking and disliking.	Members may form alternative groups.
Number of groups	Number of formal groups is not larger than the number of informal groups.	Generally the number of informal groups is larger than the number of formal groups.
Authority	Formal organization is bound together by a hierarchical structure in which authority flows from higher to lower levels. Members of a formal group derive their authority from the process of delegation.	In informal organization all members are equal though some may command more authority by virtue of their personal qualities.
Leadership	In formal organization leadership is vested in managers.	In informal organization leadership is not associated with manager ship.

Q. 13. Fill in the blanks :

    (a) A _____ person differs from an authoritarian person as his respect for _____ is not blind but is based upon organizational rules and regulations. (Bureaucratic/Authoritarianism/Authority/Innovativeness)

(b) People with high _____ manipulate others for personal gains and _____ that ends can justify means.(Mechiavellianism/Extrovertness/believe/restrict)

(c) _____ persons depend more on feelings and judgments.(Introvert/Impulsive).

(d) People with _____ personality are impatient, aggressive, and highly _____ . (A/B/D/Competitive/Jealous)

(e) People with type _____ personality are easy going, laid back and non competitive. (A/B/C/D).

Answer 13.

(a) Bureaucratic, authority

(b) Machiavellianism, believe

(c) Impulsive

(d) Type A

(e) Type B

Q. 14. What are the determinants of personality?

Answer 14.

The factors which shape the personality of an individual are given below:

(A) Biological Factor :

(i) **Heredity** — It implies the transmission from ancestors to descendant through a mechanism lying primarily in the chromosomes of the germ cells. An individual inherits physical stature, facial attractiveness, tempereament, etc. from his or her parents. However, the role of heredity differs from one personality trait to another. For example heredity is generally more important in determining a person's temperament than his ideals and values.

(ii) **Brain** — Brain is supposed to play an important role in the development of one's personality. However no conclusive proof is available so far about the role of brain in personality formation.

(iii) **Physical features** — Height, weight, colour, facial features etc. may have a great effect on one's personality. He influences others through his physical personality which in turn affects his self-concept. Rate of maturation may also affect personality because persons of varying, maturity are exposed to different physical and social situations.

(B) Family and Social Factor :

Generally, in infant acquires those personality traits and behaviour patterns which are customery and which are acceptable to his family and the community. Parents and other family members exercise a strong influence on the personality development of children. In addition to family members and home environment, social groups such as co-students, friends and co-workers affect a person's personality. Family and social groups shape a person's personality through the processes of socialization and identification.

(i) **Socialization** — It is a process by which an infant acquires from the enormously wide range of behaviour potentialities pattern that are open to him/her at birth, those behaviour patterns that are customary and acceptable to the family and social groups. This process begins with initial contact between mother and her infant. Later on, other members of the family and social groups influence the socialization process.

  (ii) **Identification** — This process occurs when a person tries to identify himself with some person whom he feels ideal in the family. Generally a child tries to behave like his mother or father. The identification process can be examined from three different perspective. First, it can be viewed as the similarity of behaviour (including feelings and attitudes) between the child and the model. Thirdly it can be considered as the process through which the child actually acquires the attributes of the model.

(C) Cultural factor :

The culture within which a person has been brought up shapes his personality. For example, American culture fosters a spirit of independence and competition whereas Japanese culture reinforces attitudes of cooperation and team spirit. However there is no linear relationship between culture and personality so that individuals within the same culture can differ in their personality and behaviour.

(D) Situational factors :

Situations may exercise both restraints and push to personality formation. Events and experiences shape the personality of a person. Some traumatic experience may transform the entire personality.

Q. 15. **Write "Yes" or "No" giving proper reasoning in support of your answer.**
 (i) **Bargaining is an important activities of the organization.**
 (ii) **Competition offers expert advice.**
 (iii) **Co-optation is the process of absorbing new elements into policy determining structure of an organization.**
 (iv) **Theory X — positive labeled**
 (v) **Perception— Infatuation**

Answer 15.
 (i) **No.** — Bargaining is the process of arriving at an agreement between two or more organizations through mutual give and take for exchange of goods or services. It is often witnessed between management and labour, the dealer and customer etc.
 (ii) **No.** — Competition is one process whereby the organizations choice of goals is partially controlled by the environment.
 (iii) **Yes.** — Cooptation as the process of absorbing new elements into the policy-determining structure of an organization as a means of averting threats to its stability or existence. It is a process by which power, or the burdens of power are shared.
 (iv) **No.** — It is negative labeled. One of the assumptions is employees inherently dislike work, and whenever possible try to avoid it.
 (v) **No.** — It is a process by which individuals organize and interpret their sensory impressions in order to give meaning to their environment.

Q. 16. **Give full forms :**
 (i) **MBO**
 (ii) **FDI**
 (iii) **BOD**
 (iv) **PSU**
 (v) **WTO**
 (vi) **AIC**

Answer 16.

  (i) MBO — Management by Objectives.

 (ii) EDI — Foreign Direct Investment.

(iii) BOD — Board of Directors.

(iv) PSU — Public Sector Unit.

 (v) WTO — World Trade Organization.

(vi) AIC — Auditor in Chief

Q. 17. Discuss Hawthorne Experiments.

Answer 17.

The human relations movement grew out of a famous series of studies conducted at the Western Electric Company from 1924 to 1933.These eventually became known as the Hawthorne Experiments, because many of them performed at Western Electric's Hawthorne plant near Chicago. The experiment was conducted by a team of researchers lead by Elton Mayo of Harvard Business School during 1924 to 1933.

  (a) Illumination Experiment :

It is generally believed that the changes in the physical working conditions have effect on production of goods and services and the productivity of the workers. The experiment was done by changing the intensity of light chosen as one of the important physical working conditions at the workplace. For the purpose of experiment two groups of workers were taken, one as the control group and the other as test or experimental group. The groups were housed in different work places. In the room where control group was kept the intensity of light was kept constant. In the room of test group the intensity light was changed by reducing the intensity slowly and gradually over a period of time. The production of the control group registered a marginal increase although there was no change in the intensity of light. Surprisingly the production of the test group kept on increasing even though the intensity of light was slowly and gradually reduced without the knowledge of the test group. The production came down when the intensity of light was brought down almost at the moonlight level. It was difficult to explain this phenomenon why the production increased even though the intensity of light was reduced. It was thus evident that the physical condition of work had no relationship with the production and this led the researchers to investigate for other factors. Subsequently it was realized that the workers of both the control group and test group started feeling important for getting special attention from the management during the period the experiment was conducted. This attention from the management was satisfying for the workers and workers as a motivator for them. It is often interpreted that possibly the social and esteem need of the workers were satisfied and worked as and motivational factor.

  (b) Relay Assembly Test Room :

This test was conducted in a room used to be known in the plant as Relay assembly room, where mainly the female workers worked and the work involved assembling telephone relays by putting together several parts. The work itself was boring and monotonous. A six women worker from the relay assembly room was selected who were friendly amongst themselves and were placed in a separate room. They were generally told about the experiment and a supervisor-researcher was kept in a separate room. The workers were friendly with the supervisor who used to take personal interest about the needs and even the personal conveniences of the workers. Layout and physical working conditions were created like the Relay assembly room of the plant. The test was conducted for two years. During this period, a series of controlled and planned changes were made in their

working conditions. Rest time was extended for some period but reduced after some time. For some period the company provided food and refreshments which was also either withdrawn or was limited to only one time free coffee. Working hours were changed in a planned manner, work tools were deliberately kept scattered. The researchers found that the production kept on increasing and stabilized at a higher level when the improvements made in the working conditions were withdrawn. During the test period the workers were neither closely supervised nor were given any financial incentives. The researchers concluded that the working condition or certain fringe benefits did not have direct relations with the production. The increase in production was explained as the result of the feeling of importance the particular employees had in the eyes of other employees for being chosed by the management for the experiment. The other contributing factors were informal and friendly relationship with supervisor and for being at times on the matters of their direct interest.

(c) Interviewing Programme :

From both the test the researchers generally concluded that the form of interpersonal relations, recognition by the management and the form of supervision are critical factors for the satisfaction and motivation of workers and consequently for the increased production. To get the feedback from the workers they were given a set of prepared questions through a structured questionaire asking for their opinion as to how they feel about their job the form of supervision and working conditions. The reply received were mostly guarded and it was felt that the workers considered many questions as irrelevant. The workers then were interviewed personally and were allowed to speak on any matter or issue relating to their work which they considered necessary to convey to the researchers. After interviewing workers the researchers realized the importance of workers social relationship within the organization the inevitability of the informal groups and the cultural assumptions the workers bring with them in the workplace.These findings gave an insight about the importance of developing proper communication systems in the organization and the importance of the workers being listened to by the management.

The conclusions and learning from Hawthorne study.

  (i) This study revealed and emphasized the importance of Human Relations approach in an organization.

 (ii) Through this experiment the importance of social needs of the workers were realized.

(iii) The importance of informal group, group norms and values were realized and this finding differed with the "Rabble Hypothesis" of Frederick Taylor.

(iv) Workers value recognition by the management.

Q. 18. Fill in the blanks.

  (i) The _____ level—the goal constraints imposed on the organization by _____ .

 (ii) The _____ level –the _____ of the _____ as a system; and

(iii) The individual level-the _____ of organizational participants.

Answer 18.

 (i) environmental, society

(ii) Organizational, goals, organization

(iv) Goals

Q. 19. Define the following in one or two sentences.

Answer 19.

(i) **Promotion :** This means appointing an employee to a position of greater responsibility. It refers to shifting of persons to positions carrying higher responsibility.

(ii) **Transfer :** This involves the shifting of an employee from one job to another with or without changing his responsibility. It is used as a source of internal recruitment to meet personnel demand at the place to which the employee is transferred.

(iii) **Layoff :** Layoff implies temporary removal of art employee from the payroll of the organization due to circumstances beyond the control of the employer. It may last for an indefinite period.

(iv) **Forecasting :** Forecasting is the process of using past and current information to predict future events and making provision to face such challenges of future contingencies.

(v) **Coordination :** Individuals and groups in an organization carry out their specialized functions and this necessitates coordination. While performing the organizing function the manager should see that all the activities are properly coordinated and there exists no conflicts.

Q. 20. Match the statement in column 1 with appropriate statement under column 2.

(i)	Non –Monetary Incentives	(a)	Abraham Maslow
(ii)	Payment by result	(b)	Welfare Measure
(iii)	Self actualization needs	(c)	Halsey and Rowan
(iv)	Non financial incentives	(d)	Continuous Process
(v)	Development	(e)	Subsidized Canteen
(vi)	Industrial Relation	(f)	Industrial peace and democracy
(vii)	Training	(g)	Internal source of recruitment
(viii)	Manpower Planning	(h)	Growth of the individual

Answer 20.

(i)   (b)

(ii)   (c)

(iii) (a)

(iv) (e)

(v)   (d)

(vi) (f)

(vii) (h)

(viii) (g)

Q. 21. Discuss the different sources of recruitment.

Answer 21.

In order to recruit, both internal as well as external sources may be utilized as follows.

Internal sources of recruitment :

Internal sources refer to the present working force of an organization. Internal sources of recruitment

include personnel already on the payroll of the organization. The major internal sources of making recruitment are as follows:

(i) Promotion : This means appointing an employee to a position of greater responsibility. It refers to shifting of persons to positions carrying better prestige, higher responsibility and more salary. Whenever a clear vacancy exists in a department it is filled in by promoting a suitable employee from the lower cadre in the same department. Employee's seniority, merit, job knowledge and career record are considered at the of promotion.

(ii) Transfer : This involves the shifting of an employee from one job to another without changing his responsibility. It is used as a source of internal recruitment to meet personnel demand at the place to which the employee is transferred.

(iii) Present employees : The present employees of an organization may be informed about likely vacant positions. The existing employees of an organization may be informed about likely vacant positions. The existing employees can recommend their relatives or friends for the jobs suitable for them.

(iv) Re-employment of ex-employees : This refers to employees who served the organization in the past but quit voluntary or due to quit voluntarily or due to retrenchment and want to return, if the organization wishes to re-employ them.

(v) Dependents : Dependents and relatives of the deceased and disabled employees can be employed on compassionate grounds.

(v) Apprentices: Persons working as apprentices in the organization may also be hired whenever a clear vacancy exists.

External Sources of recruitment :

External sources of recruitment include selection of personnel from outside the organisation.It is not desirable for the organization to rely totally on internal sources for recruitment. It is necessary to inject fresh talent into the organization from outside also. An organization may choose from the following external sources of recruitment.

(i) Advertisements: This is the best method of recruiting personnel for skilled workers, clerical and higher staff. The organization can advertise its vacancies through news papers, trade journals, professional journals, radio, television, magazines, Internet etc.It can be used on a nationwide basis and the management gets a wider range of candidates for selection.

(ii) Employment exchange : These organizations provide information about job vacancies to the job seekers and help employers finding suitable candidates.The employment exchanges provide the list of candidates to the organization when they get requisitions from various employers.

(iii) Educational Institutions : Sometimes educational institutions provide placements services. They offer opportunities for recruiting recent graduates and other diploma holders. Junior level executives or managerial trainees may be recruited from professional and technical institutions (IIM, IIT etc.)

(iv) Professional bodies : The professional institutions like (ICSI, ICWAI, ICAI, IIM, IIT and other management institutions etc.) maintain a register of qualified persons from which they recommend the names to the employers when asked for.

(v) Labour contractors : Contractors are the best sources of getting workers when they are required for short periods. Manual workers may be recruited or hired through contractors, who maintain close links with the workers.

Q. 22. Define the following in just one sentence.

    (a) Job analysis

    (b) On the job training

    (c) Charge sheet

    (d) Give two benefits of training

    (e) Give two benefits of Orientation programme

Answer 22.

(a) Job analysis is undertaken to find out the one best way of doing the thing. The best way of doing a job is one, which requires the least movement, consequently less time and cost.

(b) In this method the trainee is placed on a regular job and taught the skills necessary to perform it.

(c) The first step in the procedure for dismissal is to frame and issue a written charge sheet. It should be based upon a written complaint against the employee.

(d) (i) *Increased productivity* – Training increases the knowledge and skills of employees. Therefore well trained employees give their better performance on the job.

    (ii) *Job satisfaction* – Training builds self confidence in the employees and enables them to achieve the required level of performance. Their enthusiasm pride and interest in the job and their morale goes up.

(e) (i) The history of the organization

    (ii) Products and services of the organization.

    (iii) Organization structure of the enterprise.

    (iv) Rules and regulations.

Q. 23. Distinguish between Education and Training.

Answer 23.

Sl. No	Basis of Difference	Education	Training
1	Meaning	Education is a process of learning which increases knowledge and understanding of a person.	Training is a process of increasing knowledge, skills and attitude of an employee to do a particular job.
2	Objective	Main aim of education is to increase the knowledge of a person.	Main aim of training is to increase the knowledge of a person to do a particular job.
3.	Nature	Education is theoretical.	Training is practical.
4.	Scope	Education is a wide term and covers several aspects	Training is a narrow term and is limited to a particular aspect.
5.	Importance	Education increases the knowledge and understanding.	Training increases ability and skill.
6.	Liability	It is not a liability of an enterprise to educate its employees.	Training is a liability of the employer itself.
7.	Burden of expenses	Education expenses are generally borne by employees	Expenses of training are generally borne by the enterprise.

Q. 24. Distinguishment between Training and Development :

Answer 24.

Sl No.	Basis of difference	Training	Development
1.	Meaning	Training is a process of increasing the knowledge, skills and attitude of an employee to do a particular job.	Development is a process of learning and growth which is helpful in overall growth of employees.
2.	Objective	Main aim of training is to enable the employees to do a particular job.	Main aim of development is the overall growth of employees.
3.	Time	Training is related with present Relationship period.	Development is related with present and future period.
4.	Nature	Training is a job oriented process.	Development is a career centered process.
5.	Suitability	Training is more suitable for workers and employees.	Development is more suitable for managers and executive.
6.	Means & Methods	There are various methods of training	Development can be attained with effective leadership and managerial courses.
7.	Scope	Scope of training is limited and it is a part of development process.	Development is a wide term and includes training.

Q. 25. Name some non monetary Incentives, (or Psychological Incentives)

Answer 25.

These incentives, usually given in the form of amenities or facilities, do not offer cash reward to the employee for any specific or measured work done. Such non-monetary benefits create a psychological effect by making the working conditions and terms of employment lucrative enough to induce the employee to increase his efforts. The benefit goes to all the employees in the undertaking and is not limited to any individual, class, or group. As a result of this and also because there is no immediate return which can be linked with individual effort, the employees take the benefits for granted and the incentive element, is lost.

Non-financial benefits may be offered in several ways. A few examples are mentioned below :

(a) Favourable working conditions.

(b) Medical facilities for the individual and his family.

(c) Education facilities.

(d) Welfare measures

(e) Cheap grains

(f) Subsidized canteen

(g) Recreation amenities.

(h) Housing facilities.

(i) Pension schemes

(j) Fund contribution

(k) Protective clothing, liveries uniforms etc.

(l) Tea, milk etc.

It will be noted from the above list that some of the benefits offered are obligatory under law or are given as a matter of convention. Such benefits cannot, strictly speaking, be termed as incentives. They are non financial only so far as the employee is concerned. The employer has to incur expenditure to provide for the incentive.

Non-financial incentives offer the following advantages —

   (i) Reduce labour turn over

  (ii) Impart satisfaction to the employees and create a sense of loyalty and cooperation in them.

 (iii) Reduce absenteeism

  (iv) Create a reputation for the undertaking so that the best labour is attracted.

Q. 26. Discuss the Contingency approach of Management

Answer 26.

The contingency approach is a relatively new approach to the organization and management. It is related to the systems approach. The belief that organizations are open systems widened the perspective further leading to the development of the contingency approach. It is also known as the situational approach. It was developed by managers, consultants,and researchers who tried to apply the concepts of earlier approaches to real life situations. They found that the concepts and techniques highly effective in one situation failed to work in other situations.

The basic theme of the contingency approach is that there is no single best way of managing applicable in all situations. The best solution is the one that is responsive to the peculiarities of the given situation. Significant differences exist between one situation and others.Therefore,management should deal with different situations in different ways. In other words, the effectiveness of any technique is contingent on the given situation. The conditions and complexities of the situation determine which approach is applicable and effective. The approach or technique should be a match or fit between the situational variables and management variables. It is the responsibility of management to analyze the contingencies or conditions peculiar to each situation and then choose the right approach to deal with it.

The main factor of this approach are as follows :

   (i) Management is entirely situational. The application and effectiveness of any technique is contingent on the situation.

  (ii) Management should, therefore fit its approach to the requirement of the particular situation. To be effective management policies and practices must respond to environmental changes.

 (iii) Since management's success depends on its ability to cope with its environment it should sharpen its diagnostic skill so as to anticipate and comprehend the environmental changes.

  (iv) Managers should understand that there is no one best way to manage. They must not consider management principles and techniques universal.

Q. 27. Discuss the Principles of effective planning

Answer 27.

Planning does not substitute facts for judgment. It does not substitute science for the manager. However, some general principles can be followed to make planning effective.

 • Make plans simple and easy to understand .When the plan itself is complicated, it invites misunderstandings among the members of organization.

 • Be selective in the plan. Successful managers never try to cover too much territory.

- Plan should be geared to meet ,the needs of those who implement it.
- A plan should be through, it should not omit any function or sub-function and should not overlook any necessary details. At the same time, controversial statements should be avoided.

According to Gary Dessler, to plan effectively the managers should consider the following points :

(i) *Develop accurate forecasts* : Many a time ,managers fail to understand the forecasting techniques properly. At the same time, the people who prepare forecast may not understand the nature of people who are supposed to use these forecasts. Thus, failure to fit forecasting methods to changing needs, and circumstances is the inevitable result.

This situation can be considerably improved by educating the forecasting users in the art of relating the forecasting techniques to practical problems and also encouraging the people who are entrusted with the forecasting job to look into the informational need of managers.

(ii) *Gain acceptance for the plan* : Every plan, though made by managers at higher levels,is implemented by people throughout the enterprise. Therefore,it is necessary to secure the acceptance and commitment from them. This can be done by soliciting the subordinate's participation in the planning process itself. Participative approach to the planning is recommended here. Directive planning, i.e. technical impersonal motion developing and information using activity, is appropriate when the environment is reasonably predictable.

(iii) *Plan must be sound one* : In order to see that the plan is a sound one, an approach known as devil's advocate approach can be followed. In this approach, one advocate defends the plan, while the second (devil's advocate) prepare a counter argument listing what is wrong with the plan and why the plan should not be adopted. Such an approach would prevent managers from the dangers of hasty decisions. Further, to increase the efficiency of plans managers are advised to follow an open-system approach where they recognize and pay concentration to the complex environment in which their organization is functioning.

(iv) *Develop an effective planning organization :* Planning involves answers to several questions such as: How to plan? What to plan? Who develops the plan? etc.The solution for these questions requires a blueprint for planning and a planning organization as such. In small firms, the individual performs all the functions the individual being the owner. In case of medium- sized and big companies, separate planning department is created to have a long-term strategic orientation and to develop effective plans.

(v) *Be objective* : Many a times, managers commit a mistake of visualizing what they want to see and overestimate their chances of success. When the managers are blinded by such optimistic notions, planning can never be successful. There is no doubt that the dark side of the moon always represents a gloomy picture. The managers should not hesitate to verify the truth behind the pessimistic notions or beliefs. To see that planning is successful managers must be objective.

(vi) *Set up a monitoring system*- Plans should preferably be subjective to regular appraisal and review. Every plan should be refined and restructured on the basis of accurate and timely information. While designing the plan the manager should see that there is room for in –built flexibility. Plans should be sufficiently flexible because circumstances warrant change in plans. For the success of a plan, good monitoring system is essential.

(vii) *Revise the long-term plans every year* : Planning is fascinating and challenging especially in a dynamic environment. Changes in economic technical and political environment pose a threating challenge to the plans and continuation of the existing plans. Many a time plans become inaccurate by virtue of time factor and hence revision of long-term plans is a necessity every year.

(viii) *Fit the plan to the situation* : These days planning has become situational. The current problems of change in technology,structure,people and organization-require a situational approach to planning.

Q. 28. The Rational Model of Decision Making

                               Or

Explain the sequential set of steps in the process of decision making.

Answer 28.

Managers who weigh their options and calculate optimal levels of risk are using the Rational Model of Decision Making. This model is especially useful in making non programmed decisions. It helps managers go beyond a *priori reasoning, the* assumption that there is an obvious solution already existing and simply waiting to be found.

The basic process of rational decision making involves the four stages are discussed in below:

Stage 1 Investigate the Situation :

(A) Define the problem : Confusion in problem definition arises in part because the events or issues that the manager's attention may be symptoms of another more fundamental and pervasive difficulty. A manager may be concern about the upsurge in employee resignation, but this is not a problem unless it interferes with the achievement of organizational objectives. If the individuals resigning are low performers, and more qualified replacements can be readily found, the resignation may represent an opportunity rather than a problem. Curing the turnover problem then may be the last thing the manager should do. Defining the problem in terms of the organizational objectives that are being blocked helps to avoid confusing symptoms with problems.

(B) Diagnose the Causes : All this underscores the importance of diagnosing the causes of the problem. Managers can ask a number of diagnostic questions. Each involves in some way human relationships .What changes inside or outside the organization may have contributed to the problem? What people are most involved with the problem situation? Causes unlike symptoms are seldom and managers sometimes have to rely on intuition to identify them. Different individuals, whose views of the situation are inevitably shaped by their own experiences and responsibilities, may perceive very different causes for the problem. It is up to the manager to put all the pieces together and come up with as clear picture as possible.

(C) Identify the Decision Objectives : Once the problem has been defined and the causes diagnosed the next step is to decide what would constitute an effective solution. Most problems consists of several elements and a manager is unlikely to find one solution that will work for all of them.

If a solution enables managers to achieve organizational objectives , it is a successful one. However more ambitious objectives may be appropriate. The immediate problem may be an indicator of future difficulties a manager can prevent by taking early action. Else, the problem may offer the opportunity to improve rather than merely restore, organizational performance.

What should be noted about all three aspects of problem investigation is the importance of a manager's education about the world and his or her imagination.

Stage 2 Develop Alternatives :

The stage may be reasonably simple for most programmed decision but not so simple for complex non programmed decisions, especially if there are time constraints. Too often the temptation to accept the first feasible alternative prevents managers from finding the best solutions for their problems. To prevent this major decision should be made until several alternatives have been developed. To increase their

creativity at this task some managers turn to or group brainstorming in which participants spontaneously propose alternatives even if they seem unrealistic or fantastic.

Stage 3 Evaluate Alternatives and Select the Best Available :

Once managers have developed a set of alternatives they must evaluate each one on the basis of the three key questions.

(a) **Is this alternative feasible**. Does the organization have the required money and other resources to carry out the alternative? Replacing all obsolete equipment might be an ideal solution but it is not feasible if the company is already near bankruptcy. Does this alternative meet all the organization's legal and ethical obligation ? Any solution is only as effective as the support it wins within the organization. Therefore in evaluating the alternative , managers must try to anticipate what would happen if employees fail to support and implement it wholeheartedly.

(b**) Is the alternative a satisfactory solution?** To answer a manager need to consider two additional questions. First does the alternative meet the decision objectives? Second does the alternative have an acceptable chance of succeeding? (This assumes the chance can be calculated; in conditions of uncertainty, of course this may be extremely difficult or impossible.) Managers should realize too, that the definition of acceptable may differ from organization to organization and from person, depending on the organization's culture and the risk tolerance of those involved in the decision.

(c) **What are the possible consequences for the best of the organization**? As an organization is a system of interrelated parts and exists among other systems, managers must try to anticipate how a change in one area will affect other areas – both now and in the future. Cutting back research and development for example might save money in the short term but could cripple the organization in the long run. If the decision might affect people in other departments, they too should be consulted. Competitors may also be affected by the decision; their reactions will have to be taken into account. Alternative negative consequence will usually be favored over those with merely neutral consequences.

Stage 4 Implement and monitor the decision :

Once the best available alternative has been selected managers are ready to make plans to cope with the requirements and problems that may be encountered in putting it into effect. Implementing a decision involves more than giving appropriate orders. Resources must be acquired and allocated as necessary. Managers set up budgets and schedules for the actions they have decided upon, allowing them to measure progress in specific terms. Next they assign responsibility for the specific tasks involved. They also set up a procedure for progress reports and prepare to make corrections if new problems should arise. Budgets, schedules and progress reports are all essential to performing the management functions of control.

Potential risks and uncertainties that have been identified during the earlier evaluation of alternative stages must also be kept in mind. There is a natural human tendency to forget possible risks and uncertainties once a decision is made.. Managers can counteract this failing by consciously taking extra time to reexamine their decisions at this point and to develop detailed plans for dealing with these risks and uncertainties.

After managers have taken whatever steps are possible to deal with potential adverse consequences actual implementation can begin. Ultimately a decision is no better than the actions taken to make it a reality. A frequent error of managers is to assume that once they make a decision, action on it will automatically follow. Even if a decision is a good one, if others are unwilling or unable to carry it out then the decision will not be effective.

Q. 29. Write short notes on :

(a) **Management by Objectives.**

(b) **PERT and CPM.**

Answer 29. (a) Management by Objectives :

Management by objectives is a popular management techniques which is applied as a technique of planning, motivation and control. The famed management author Peter Drucker introduced the concept in 1954 as a way of successful organization. It provides an integrated approach to planning and control.

An effective MBO programmed begins with clearly set goals and strategies at the top management level. These are communicated to the middle and lower managerial levels as guideline for planning. Managers at every level formulate their goals based on the corporate goals, but in consultation with their supervisors. It is a joint and participating activity. The goals so set and the means of achieving them becomes guide posts for managers in directing their efforts and evaluating their performance.

In MBO the individual managers are given some autonomy to set their goals and to determine the means of achieving them. It is likely that the technique promotes realistic goal setting and full involvement of managers of all level in achievement of goals.

Answer 29. (b) PERT and CPM :

PERT and CPM are network techniques or models especially useful for planning scheduling and executing large time bound projects which involve careful coordination of a variety of complex and interrelated activities and resources. PERT stands for Programme Evaluation and Review Techniques and CPM for Critical Path Method. Both the techniques were developed in USA during the 1950s PERT was developed by US Navy Engineers to plan and control the huge Polaris Submarine programme . CPM was developed by Du Pont and Remington Rand companies to help the process of scheduling maintenance of chemical plants. Both the techniques have been applied successfully to improve of efficiency of execution of large projects within pre-determined time and cost limits. Any new venture may be regarded as project such as construction of a new plant, handling an earthquake relief work and so on.

PERT and CPM converge on several aspects and are almost treated as twins there are however some differences between them which shall be indicated later on. The techniques recognize the systems or inter related nature of activities in large work projects. The application of PERT and CPM are intended to answer the following questions :-

(a) How soon will the project be completed?

(b) When is each individual phase of the project scheduled to start and finish?

This techniques is very useful in the case of projects which involve a large number of activities.It makes the project manager list out all the possible activities and their relationships find out which activities can be performed first, which next and which can be simultaneously and thereby find out the best possible manner of completing the project.

Q. 30. Discuss Forecasting and its advantages and disadvantages.

Answer 30.

Forecasting is the process of using past and current information to predict future events and making provision to face such challenges of future contingencies. In the words of Henry Fayol "The plan is the synthesis of various forecasts; annual long-term, special etc.It is a sort of picture of the future where immediate events are shown clearly, the prospects or the future with less certainty".

Advantages of Forecasting :

The following are the payoffs of forecasting:

  (i) Forecasting plays an important role in planning .In fact, plans are based on forecasts.

 (ii) Forecasting helps the organization to derive the benefits from the environmental changes and protect from the adverse effects.(when the changes are unfavourable).

(iii) Forecasting helps the manager to unify and coordinate the activities in the enterprise.Accurte sales forecast is almost impossible in the absence of general business forecasting.

(iv) Forecasting facilitates control by identifying the weak spots in the organization .When once these weak spots are identified. It becomes easy for the managers to establish sign posts for effective control and sound planning thereafter.

 (v) Forecasting helps the enterprise in the achievement of objectives effectively and smoothly.

Limitations of Forecasting :

Forecasts are just estimates of future conditions but not indicators of actual position. Future is almost always shrouded by the shadows of uncertainty and it may be possible that the best laid plan may not yield fruitful results and bad plan may derive supernormal profits to the firm. It is a near – impossible task for the manager to map out all the future possibilities and make the organization ready for encountering them. Uncertainty places a serious limitation to forecasting. Successful forecasts are as many managers contend, a matter of chance.

Another long standing limitation of forecasting is that it is based on certain assumption about the future and such it involves guess work on the part of managers. In this process, some errors may creep in rendering the forecasts unreliable. Further forecasting is expected to create wonders. That is to say, too much is expected from forecasting on the part of managers. The success of forecasting depends largely on the skillful application of forecasts into practice and the meticulous care that is taken by the managers in preparing forecasts. A forecast should to be successful, consider arriving at a magic figure not by the fanciful guess work but by a careful analysis of the past events and project them into future more rationally.

Q. 31. Organizing Process –

Answer 31.

As a function of management, i.e as a process organizing includes the following :

  (i) Identifying the work

 (ii) Grouping the work

(iii) Establishing formal reporting relationship

(iv) Providing for measurement evaluation and control.

 (v) Delegation of authority and responsibility.

(vi) Co-ordination

Then may be explained as :-

(i) Identifying the work :

The first step in the organization process is to identifying the work to be performed in the organizational unit i.e enterprise.Every organization is created deliberately to achieve some objectives- to produce and distribute goods and services with the objective of making maximum profits. Similarly a hospital is established to provide medical care to sick patients, a cooperative organization is established to provide

to service to the members of the society etc.It is absolutely essential to identify the work to be performed to achieve these goals. Work must be divided and distributed because no one individual can perform the total work in an organization single handed. Identification and classification of work enables managers to concentrate on important activities, avoiding the unnecessary duplications, overlapping and wastage of effort.

(ii) Grouping the work :

Dividing work is the root cause of coordination. After making the vision, similar activities shall be grouped together in order to provide for a smooth flow of work. Departments and divisions are created in an organization based on the principle of similarity and relatedness of the activities performed. For instance, purchasing and storing activities can be grouped, sales and advertising activities can be grouped together, budgeting and accounting activities can be grouped together etc.Depending on the size of a organization there could be several departments for every separate function. In small organization various departments may be grouped together and headed by only one or a few individuals.

(iii) Establishing formal reporting relationships :

One of the steps in organizing function is to establish formal reporting relationships among individual members in the enterprise. After establishing these formal relationships it would be possible to know what must be done, how it must be done, who is to do it etc.Establishment of formal reporting system should pave way for assigning the duties and responsibilities to individual in an unambiguous fashion.

(iv) Providing for measurement evaluation and control :

Organization function involves providing the basis for measurement, evaluation and control of the activities. It should establish signposts and control points in the organization so that the performance of individuals (and groups) can be measured , evaluated and controlled at periodical intervals. The purpose of such evaluation is to take necessary rectificational measures if there are serious deviations in the actual performance.

(v) Delegating authority :

Authority is the right to act, and extract obedience from others. A manager may not be able to perform tasks without granting authority to him by the organization. While assigning duties the manager should clearly specify authority and responsibility limits. For example, the purchase manager may be delegated authority to purchase goods and pay for them. In the absence of such delegation the manager may not be able to purchase the goods.He may also be specified about the limit up to which he can purchase the goods.

(vi) Coordination :

Individuals and groups in an organization carry out their specialized functions and this necessitates coordination. while performing the organizing function the manager should see that all the activities are properly coordinated and there exists no conflicts. Both individuals and groups may come in conflict while performing their respective duties or functions in the organization.

Q. 32. Define the following in just one sentence.

Answer 32.

T- group training / Sensitivity Training – It is another popular technique employed by several organization with the basic objectives of improving the interpersonal relationships in the organization.

Give four functions of Supervisors.

  (i) Communicating the orders

  (ii) Introductions of new methods of work

(iii) Making the work more interesting

(iv) Selecting the workers.

(i) ***Communicating the orders – The*** first duty of the supervisor is to communicate the order to subordinates. The orders should be simple, complete and in a language easily understandable to the subordinates.

(ii) ***Introduction of new methods of work*** - Every supervisor should examine the existing methods of work and try his level best to improve the methods of performing work in order to increase the productivity per worker.

(iii) ***Making the work more interesting*** - A supervisor should make the work interesting, instead of dull and boring .A subordinate would feel like working only when he/she is comfortable at work.

(iv) ***Selecting the workers*** – In small and medium sized organizations, supervisors play a crucial role in selecting the workers. A supervisor should outline the job specification and job description so that right people are selected for right places and at right time.

Q. 33. State the difference between Theory X and Theory Y

Answer 33.

Theory X	Theory Y
1. Inherent dislike for work	1. Work is natural like rest or play.
2. Unambitious and prefer to be directed by others.	2. Ambitious and capable of directing their others own behaviour.
3. Avoid responsibility.	3. Accept and seek responsibility under proper conditions.
4. Lack creativity and resist change	4. Creativity widely spread
5. Focus on lower level (physiological and safety) needs to motivate workers.	5. Both lower level and higher order needs like social, esteem and self actualization are sources of motivation.
6. External control and close supervision required to achieve organizational objectives.	6. Self direction and self Control.
7. Centralization of authority and autocrat leadership.	7. Decentralisation and participation in leadership decision –making .Democratic leadership.
8. People lack self - motivation	8. People are self – motivated.

Q. 34. Discuss Self – actualization needs as stated by Abraham Maslow in Need Hierarchy Theory.

Answer 34.

There are the needs for realizing one's full potential, for continued self development, for being creative. It is the desire of becoming what one is capable of becoming. It is an infinite and growth need. It is psychological in nature and very few persons satisfy it. The conditions of modern industrial life provide limited opportunity for the satisfaction of self – actualization.

Need hierarchy represents a typical pattern that operates most of the time. It must not be viewed as a rigid structure to be applied in all situations.

Maslow's need priority model of motivation has gained extensive popularity because it is simple and logical. It is compatible with the economic theory of demand. The theory helps to explain why a person behaves differently in two similar situations. It provides an insight into what is common to all. It extends to all areas of human life and is not limited to work situation alone.

But this theory is widely criticised for the following reasons.

(i) Needs are not the only determinant of behaviour.People seek objective and engage in behaviour that are in no way connected with the gratification of needs. There are other motivating factors like perceptions, expectations experiences etc.

(ii) Theory gives an over simplification of human needs and motivation. Need recognition and fulfillment donot always follow the specific sequence of hierarchy suggested by Maslow, need classification is somewhat artificial and arbitrary as human needs cannot by classified into neat watertight compartments.Therefor the theory may not have universal validity.

(iii) Maslow's theory is based on a relatively small sample. It is a clinically derived theory and its unit of analysis is the individual. That is why Maslow presented his model with apologies to those who insisted on conventional reliability,validity, sampling etc.

Despite these limitations this theory has a common sense appeal for managers. It is still relevant because needs are important for understanding behaviour.It helps to explain inter-personal and intra-personal differences in human behaviour.

Q. 35. Write short notes on :
   (a) Break even analysis
   (b) Free-rein or Laissez-fair leadership

Answer 35. (a) Break even analysis :

Also called Cost- Volume Profit analysis, break even analysis is a tool of contra size up the behaviour of costs, revenues and profit various levels of activity. It enables management to understand the amount of profit that can be expected at various volumes of operations, the appropriate volume of operations needed to obtain a target level of profit, and the impact of changes in product prices and costs on the volume of operations and profitability.

Break even analysis is adopted as a tool of profit planning. it is a technique of both planning and control.

Answer 35. (b) Free –rein or Laissez – fair leadership.

Free-rein leadership involves complete delegation of authority so that subordinates themselves take decisions. The free rein leader avoids power and relinquishes the leadership position. He serves as a contact to bring the information and resources needed by the subordinates.

Advantages :
   (i) Positive effect on job satisfaction and morale of subordinates;
   (ii) Maximum possible scope for development of subordinates;
   (iii) Full utilization of the potential of the subordinates.

Q. 36. Write short notes on :
   (a) Distinguish between Delegation and Decentralization
   (b) Group

Answer 36. (a)

Distinction between Delegation and Decentralization.

Delegation	Decentralization
1. It is a process or an art.	1. It is the end result of delegation.
2. It denotes relationship between a superior and a subordinate.	2. It denotes relationship between the top management and various department oer divisions.
3. It is essential for management process.	3. It is optional as top management may or may not disperse authority.
4. The delegator exercises control over the subordinates.	4. The control may delegate to departmental heads.
5. It is a technique of management	5. It is a philosophy of management.

Answer 36. (b)

Group : A group is an assemblage, cluster,or aggregation of persons considered to be related in some way or united by some common interests. According to Edgar Schien a psychological group consists of any number of people who :-

Interact with one another

Are psychologically aware of one another; and

Perceive themselves to be a group.

Why people join groups?

(i) According to C.Gratton Kemp the desire for need satisfaction is a strong motivating force for the formation of groups. More specifically the security, social esteem and self-actualization needs of some employees can be satisfied only when they join groups.

(ii) Groups provide some degree of warmth and support for individuals and security to the members.

(iii) Another reason for the people to group themselves is the proximity and attraction. Proximity means the physical distance between employees performing job. Attraction means attraction of people by virtue of their perception of similarity .People who have close proximity have a tendency to form groups.

(iv) Individuals may be attracted to join groups by virtue of the group goals.

(v) The formal groups can be extremely useful in solving specific work problems in organization.

Q. 37. **(a) Discuss Inter group Conflict.**

(b) Resistance to change

Answer 37. (a) Inter group conflict :

Group exit in every organization both at formal as well as informal level. There may be conflict within one group or conflict among groups The first kind of conflict is mostly interpersonal. Therefore intergroup conflict becomes more important form of group conflict. There are various factors which determine intergroup relationships. These factors are as follows.

1. *Incompatible goals.* The goals of two groups may have powerful impact on their relationship. Each group tries to accomplish its own goals. Intergroup conflict arises when goals of two or more

groups are incompatible i.e goal attainment by one may prevent or reduce the level of goal attainment of one or more groups.

2. *Resource Sharing* – The relationship between two groups can be affected by degree to which two groups draw resources from a common pool, and the degree to which this common pool is not adequate to meet the demands of both the groups. Conflicts arises because of discrepancy between aggregated demand and available resources. Each party to the conflict has an interest in making total resources as large as possible but also in securing as large a share of them as possible.

3. *ask interdepence*- Task interdepence refers to the dependence of one unit on another for resources. It may result in one group having the ability to dictate the outcome of interaction between two groups. This happens when one group exceeds its authority and conflict arises.

4. *joint decision* –making process- Because of interdepence groups involve in joint decision making process. This process may not progress smoothly in the following circumstances.;-

(i) If people have different sources of information.

If there are leakage and blockages in the channeling of information to different lavels and departments.

Answer 37. (b) Resistance to change :

Individuals may respond to change in three wayside acceptance, indifference and resistance, depending upon how they perceive the change. the main individual and organizational reasons for resistance to change are given below :

1. Fear of economic loss.

People resist change when they will lose some economic benefits. Following are some examples.

  (i) Fear of technological unemployment

 (ii) Fear of reduced work hours and consequently reduced monetary benefits.

(iii) Fear of demotion and consequently less pay.

2. Obsolescence of Skills.

Change may render the existing knowledge and skills obsolete. Old skills and techniques may become useless. For example an experienced accountant may resist the introduction of a computer due to the fear that his experience will become useless and it might affect his pay and position in the organization. this phenomenon is commonly found in people who possess no marketable skills and whose knowledge is outdated.

3. Fear of Unknown

Change causes uncertainty and risk during the transition period. The unknown poses a constant threat to people because the impact of change is unknown. For instance an employee may resist transfer to a remote branch because of the anxiety of an unfamiliar place.

4. Ego Defensiveness

Sometimes people resist change because it hurts their ego. For instance an ego defensive branch manager may resist even a good suggestion from the salesman because the branch manager feels that his ego may be deflated if he accepts the suggestion.

FOUNDATON EXAMINATION

(REVISED SYLLABUS - 2008)

Paper - 2 : ACCOUNTING

Section I : Financial Accounting

Q. 1. (a) **In each of the following, indicate the correct answer :**

  (i) **The basic concepts related to Balance Sheet are :**
    (A) **Business entity concept**
    (B) **Accounting period concept**
    (C) **Matching concept**
    (D) **Realisation concept**

  (ii) **As per double entry concept,**
    (A) **Capital – Liabilities = Assets**
    (B) **Capital + Assets = Liabilities**
    (C) **Capital = Assets – Liabilities**
    (D) **ssets + Liabilities = Capital**

  (iii) **According to AS 2, inventories should be valued at**
    (A) **Replacement cost**
    (B) **Lower of Historical cost and replacement cost**
    C) **Realisation value**
    (D) **Lower of Historical cost or Net realizable value**

  (iv) **Closing stock in the Trial Balance implies that**
    (A) **It is already adjusted in Sales A/c**
    (B) **It is already adjusted in Purchase A/c**
    (C) **It is already adjusted in Opening Stock**
    (D) **It is already adjusted in Profit & Loss A/c**

  (v) **Bank overdraft is shown as a**
    (A) **Current Asset**
    (B) **Current Liability**
    (C) **Contingent Liability**
    (D) **Provision**

  (vi) **DEF Club paid subscription fees of Rs. 10000, out of which Rs. 1500 is prepaid. In such case**
    (A) **P&L A/c is debited with Rs. 10000**
    (B) **P&L A/c is debited with Rs. 8500**
    (C) **Rs. 1500 is shown as current asset.**
    (D) **Both B and C.**

(vii) **The following data is extracted from the books of A Ltd. for the year 2010-11.**

Bad debts for the year	**Rs. 4000**
Closing balance of Sundry Debtors	**Rs. 100000**
Provision for B/D as on 1.1.2010	**Rs. 20000**

If the company wishes to maintain provision for bad debts at 10% of debtors, the amount debited/credited to profit and loss A/c for the year ended 31.3.11 is —

(A) **Rs. 10000 debit**

(B) **Rs. 6000 credit**

(C) **Rs. 6000 debit**

(D) **Rs. 8000 credit**

Workings :

Provision for B/D A/c

Particulars	*Rs.*	*Particulars*	*Rs.*
To B/D	4000	By Opening balance	20000
To Closing Bal (10% × 100000)	10000		
To P/L (bal. fig.)	6000		
	20000		**20000**

(viii) **S enterprise maintains imprest system of petty cash book, the amount of imprest being Rs. 1000. The petty cash transactions during the month of August 2010 are as under :**

Particulars	*Amount (Rs)*
Conveyance	**186**
Repairs	**228**
Stationary	**154**
Stamps	**145**
Other expenses	**93**

The amount of cash reimbursed to make up imprest balance is :

(A) **Rs. 578**

(B) **Rs. 806**

(C) **Rs.422**

(D) **Rs. 1000**

Workings :

Particulars	*Amount (Rs)*	*Amount (Rs.)*
Petty cash		1000
Less: Conveyance	186	
** Repairs**	228	
** Stationary**	154	
** Stamps**	145	
** Other expenses**	93	806
	194	194
Amount reimbursed		806
Petty cash		1000

(ix) **M/s GHI sent goods on approval basis to Mr. Y at invoice price of Rs.80000. The cost of such goods is Rs. 60000. The enterprise accounted the above transaction as credit sales. The rectification of the above will be to :**

    (A) **Decrease sales as well as debtors by Rs. 80000**

    (B) **Increase closing stock by Rs. 60000**

    (C) **Decrease closing stock by Rs. 60000**

    (D) **Both A and B.**

(x) **From the books of Mr. N , it was observed that cheques amounting to Rs. 240000 were deposited in the bank, out of which cheques worth Rs. 20000 were dishonoured and cheques worth Rs. 40000 are still in the process of collection. The treatment of this while preparing Bank Reconciliation Statement is**

    (A) **Deduct Rs. 60000 from bank balance as per pass book.**

    (B) **Add Rs. 20000 and deduct Rs. 40000 from overdraft balance as per cash book.**

    (C) **Deduct Rs. 60000 from overdraft balance as per pass book.**

    (D) **Add Rs. 60000 from overdraft balance as per pass book.**

(xi) **X draws a trade bill of Rs. 25000 for 6 months on Y. After holding the bill for 1.5 months, X discounts the bill with bank @ 10% p.a. The amount of discount on bill is :**

    (A) **Rs. 937.50**

    (B) **Rs. 625**

    (C) **Rs. 1350**

    (D) **Rs. 612.50**

Working :

Discount = Face value of bill × Rate of interest × unexpired months of bill/12

        = 25000 × 10/100 × 4.5/12

        = Rs. 937.50

(xii) **X acquired an equipment for Rs. 80000 with an expected useful life of five years and Rs. 4000 expected residual value. Straight line method of depreciation was used. The equipment was sold at the end of 4th year for Rs. 30000. The gain /loss on sale is :**

    (A) **Rs. 12000 (gain)**

    (B) **Rs. 10800(loss)**

    (C) **Rs. 10800(gain)**

    (D) **Rs. 12000(loss)**

Working :

Depreciation = (80000-4000)/5 = Rs. 15200

Gain = Rs. 30000 − (80000 − 4 × 15200) = Rs. 10800.

(xii) In the year 2010-11, H purchased a new machine and following payments were made in relation to it :

Cost as per supplier's list =	Rs. 520000	
Less: Discount agreed =	Rs. 50000	Rs. 470000
Delivery charges =		Rs. 10000
Annual maintenance charges =		Rs. 30000
Erection charges =		Rs. 20000
Additional components to increase the capacity of machine =		Rs. 40000
Annual insurance premium =		Rs. 5000

The cost of the machine is :

(A) Rs.550000

(B) Rs. 470000

(C) Rs. 540000

(D) Rs. 570000.

Working : Annual maintenance charges and insurance premium are revenue expenses. Rest charges are to be capitalized with cost of the machine. So cost of machine is :

Cost as per supplier's list =	Rs 520000	
Less: Discount agreed =	Rs. 50000	Rs. 470000
Add: Delivery charges =		Rs. 10000
Add: Erection charges =		Rs. 20000
Add: Additional components to increase the capacity of machine =		Rs. 40000
Total cost =		Rs. 540000

(xiv) For Sales Return at Branch, in case of dependent branches, entry to be passed in HO books,

(A) Debit Branch Debtors A/c, Credit Branch Stock A/c.

(B) Debit Branch Stock A/c, Credit Branch Debtors A/c.

(C) Debit Sales A/c, Credit Branch Debtors A/c.

(D) Debit Sales A/c, Credit Branch Stock A/c.

(xv) For difference between invoice price and the cost price of the entire consignment, the entry in books of consigner will be :

(A) Debit Goods sent on Consignment A/c, credit Consignment A/c

(B) Credit Goods sent on Consignment A/c, debit Consignment A/c

(C) Credit Consignment Stock Reserve A/c, debit Consignment A/c

(D) Debit Consignment Stock Reserve A/c, credit Consignment A/c

Answer 1.

(i) (A) Business entity concept

(ii) (C) Capital = Assets − Liabilities

(iii) (D) Lower of Historical cost or Net realizable value

(iv) (B) It is already adjusted in Purchase A/c

(v) (B) Current Liability

(vi) (D) Both B and C.

(vii) (B) Rs. 6000 credit

(viii) (B) Rs. 806

(ix) (D) Both A and B.

(x) (C) Deduct Rs. 60,000 from overdraft balance as per pass book.

(xi) (A) Rs. 937.50

(xii) (C) Rs. 10,800 (gain)

(xiii) (C) Rs. 5.,40,000

(xiv) (B) Debit Branch Stock A/c, Credit Branch Debtors A/c.

(xv) (D) Debit Goods sent on Consignment A/c, credit Consignment A/c

Q. 2. Fill in the blanks with appropriate word/words :

(i) **Gross Profit is the difference between _____ and cost of goods sold.**

(ii) **Fixed assets and current assets are categorized as per concept of _____ .**

(iii) **AS 3 deals with _____ statements.**

(iv) **Provision for bad debts appear a _____ on the Balance Sheet.**

(v) **Insurance prepaid is shown as _____ .**

(vi) **Legal charges of Rs. 5000 for acquisition of building wrongly entered in the legal expenses A/c is an example of _____ .**

(vii) **The doctrine of implied authority is _____ in case of co-venturers.**

(viii) **From accounting point of view, loss means _____ in owner's equity.**

(ix) **In case of manufacturing concerns, the balance in 'Goods Sent to Branch A/c' will be transferred to _____ Account.**

(x) **Depreciation is a _____ profit.**

(xi) **When a fixed asset is obtained as a gift, the account to be credited is _____ A/c.**

(xii) **A bill of exchange is drawn on 1st April 2011, payable after 3 months ; due date of the bill is _____ .**

(xiii) **Credit balance in Pass Book indicates _____ balance.**

(xiv) **Salaries Outstanding A/c is a _____ A/c.**

(xv) **The difference of the capital at the end and the capital at the beginning will show _____ provided there are no drawings.**

Answer 2.

(i) Net Sales

(ii) Going concern

(iii) Cash flow

(iv) liability

(v) Current Asset

(vi) error of principle

  (vii) not applicable

 (viii) decrease

   (ix) Trading

    (x) charge against.

   (xi) Capital Reserve.

  (xii) 4th July, 2011

 (xiii) favourable

 (xiv) Personal

  (xv) profits earned

Q. 3. State with reasons, whether the following statements are *True* or *False* :

    (i) Goodwill is a fictitious asset.

   (ii) Debit balance in the Profit and Loss A/c is treated as surplus.

  (iii) Bank Reconciliation Statement is prepared to arrive at balance as per bank statement.

  (iv) Capital is shown on the liability side because of Business Entity Concept .

   (v) Depreciation is a process of apportionment.

  (vi) Sales Journal is used for recording credit sales.

  (vii) Noting charges are paid by the holder of the bill on the date of default.

 (viii) Branch which sells goods for cash only is not required to maintain account books.

  (ix) There is no difference between the normal commission and the del credere commission paid to the consignee.

   (x) "Joint Venture with — [name of co-venture(s) A/c]" does not disclose profit/loss on Joint Venture.

  (xi) If Trial Balance tallies, it always means that none of the transactions has been completely omitted.

  (xii) Expenses incurred in connection with obtaining license for starting a factory is capital expenditure.

 (xiii) The adjustment to be made for income received in advance is to add income received in advance to respective income and show it as a liability.

 (xiv) Tax Deducted at Source appears in the Balance Sheet on liabilities side under provisions.

  (xv) Drawings does not appear in Profit and Loss A/c.

Answer 3.

    (i) False — Goodwill is an intangible asset.

   (ii) False — Debit balance in the Profit and Loss A/c is treated as deficit or loss as expenses are more than income.

  (iii) False — Bank Reconciliation Statement is prepared to find the reasons of differences in balance as per Cash Book and Bank Statement.

  (iv) True — Business is treated as an entity apart from the owners.

   (v) False — Depreciation is a process of allocation.

  (vi) True — Cash Sales are recorded in Cash Book.

  (vii) True — Noting charges are paid by the holder of the bill to get the bill noted for dishonor on the date of its dishonor.

 (viii) True.

  (ix) False — Commission is reward to consignee to sell goods on behalf of the consignor. Del credere commission is allowed to consignee in order to cover the risk of loss due to bad debts.

(x) True — It is nature of personal A/c. Memorandum JV A/c is opened to find out P/L on Joint Venture.

(xi) False — Error of omission does not affect a Trial Balance.

(xii) True — It is incurred for acquiring a right to carry on business for a long period.

(xiii) False — Income received in advance given as an adjustment requires deduction of the same from the income amount and disclosure of the same as a liability in the balance sheet.

(xiv) False — Tax Deducted at Source appears in the Balance Sheet on liabilities side under current liabilities.

(xv) True — Drawings are neither an income nor an expense to be recorded in Profit and Loss A/c.

Q. 4. Give one word or phrase to describe the following :

(i) **Book of original entries.**

(ii) **What type of asset is a Coal Mine?**

(iii) **Advance Tax A/c appearing in the Trial Balance is shown on which side of Balance Sheet?**

(iv) **Cash purchase of trading goods is initially recorded in which book?**

(v) **The account through which rectification of errors detected in the next financial year is carried out.**

(vi) **Subscriptions received in advance by a club appear in which side of Balance Sheet?**

(vii) **The Account that does not form part of double entry system.**

(viii) **Agent selling goods on behalf on consignor.**

(ix) **Account showing Profit /Loss on Joint Venture.**

(x) **Refusal by acceptor to make payment of the bill on the maturity date is called_____.**

(xi) **Owners' equity + Outsiders liability.**

(xii) **Bad debts recovered is credited to this A/c.**

(xiii) **As per AS 10 , fixed assets that have been retired from active use and held for disposal should be stated in balance sheet at this value.**

(xiv) **Opening stock + Purchases+ Gross profit+ Direct expenses - Closing stock.**

(xv) **Omission of paise and showing the round figures in financial statements is based on this concept.**

Answer 4.

(i) Journal

(ii) Wasting Asset

(iii) Assets side

(iv) Cash Book

(v) Profit and Loss Adjustment A/c

(vi) Liabilities

(vii) Memorandum A/c

(viii) Consignee

(ix) Joint Venture A/c

(x) dishonour of bill

(xi) Assets

(xii) P/L A/c

(xiii) Lower of net book value or realizable value

(xiv) Sales

(xv) Materiality concept

Q. 5. Journalise the following transactions :

  (i) Assets as on 1/4/2011: Cash in hand Rs. 2000, Cash at Bank Rs. 68000, Stock Rs. 40000, Machinery Rs. 1,00,000, Furniture Rs. 10,000, M/s X owe Rs. 15000, M/s Y owe Rs. 25000.

     Liabilities as on 1/4/2011 : Loan Rs. 50000, Sum owing to M/s Z Rs. 20000.

 (ii) While carrying forward the total of one page of the Purchases Book to the next, the amount of Rs. 21235 was written as Rs. 21325.

(iii) Stock taken for private use Rs. 25,000.

 (iv) Purchased goods worth Rs. 16,000 less 20% trade discount and 5% cash discount from M/s M for cash and supplied them to M/s R at list price less 10% trade discount.

  (v) A dishonoured Bill of Exchange receivable for Rs. 15,000 returned by the Bank had been credited to the Bank and debited to Bill Receivable A/c.

 (vi) The Balance in Revaluation Reserve A/c is Rs. 60,000 pertaining to Machinery that has been disposed off is to be transferred.

Answer 5.

  (i)

Date	Particulars		L.F	Debit (Rs)	Credit (Rs)
1/4/2011	Cash A/c	Dr.		2,000	
	Bank A/c	Dr.		68,000	
	Stock A/c	Dr.		40,000	
	Machinery A/c	Dr.		1,00,000	
	Furniture A/c	Dr.		10,000	
	M/s X A/c	Dr.		15,000	
	M/s Y A/c	Dr.		25,000	
	To Loan A/c				50,000
	To M/s Z A/c				20,000
	To Capital A/c				1,90,000
	(Being balances brought forward)				

  (ii)

Date	Particulars		L.F	Debit (Rs)	Credit (Rs)
	Suspense A/c	Dr.		90	
	To P/L Adjustment A/c				90
	(Being correction of error whereby Purchases A/c was debited in excess through carry forward of the total on page .... of Rs. 21235 as Rs. 21325.)				

  (iii)

Date	Particulars		L.F	Debit (Rs)	Credit (Rs)
	Drawings A/c	Dr.		25,000	
	To Purchase A/c				25,000
	(Being stock taken for private use)				

(iv)

Date	Particulars	L.F	Debit (Rs)	Credit (Rs)
	Purchases A/c Dr.		12,000	
	To Cash A/c			12,000
	(Being purchased goods worth Rs. 16,000 less 20% trade and 5% cash discount)			
	M/s R Dr.		14,400	
	To Sales			14,400
	(Being sold goods for 16,000 less 10% trade discount)			

(v)

Date	Particulars	L.F	Debit (Rs)	Credit (Rs)
	Drawee's A/c		15,000	
	To Bill Receivable A/c			15,000
	(Being amount of dishonoured bill wrongly debited to Bills Receivable A/c instead of Drawee's A/c; error now rectified)			

(vi)

Date	Particulars	L.F	Debit (Rs)	Credit (Rs)
	Goodwill A/c Dr.		60,000	
	To Revaluation Reserve A/c			60,000
	(Being balance in Revaluation Reserve A/c transferred to Goodwill A/c)			

Q. 6. Pass necessary rectifying entry for the following errors :

   (i) **Machinery purchased for Rs. 15,600, has been entered in the Purchase Day Book.**

   (ii) **Legal Expenses of Rs. 9,500 paid to Mr. Y were debited to his Personal A/c.**

   (iii) **Rs. 5,740 paid for Repairs to Motor Car, was debited to Motor Car A/c Rs. 1,740.**

   (iv) **Goods bought on credit from M/s N for Rs. 15,000 were entered in the Sales Books as Rs. 10,500; M/s N was credited with Rs. 10,500 in the ledger.**

   (v) **Rs. 5,400 received from X was posted to debit of his account.**

Answer 6.

(i)

Date	Particulars	L.F	Debit (Rs)	Credit (Rs)
	Plant & Machinery A/c Dr.		15,600	
	To Purchases A/c			15,600
	(Being machine purchased for Rs. 15,600 previously charged to Purchased A/c; error now corrected)			

(ii)

Date	Particulars	L.F	Debit (Rs)	Credit (Rs)
	P & L Adjustment A/c Dr.		9,500	
	To Mr. Y			9,500
	(Being the amount of legal expenses charged to Mr. Y; error now rectified)			

(iii)

Date	Particulars	L.F	Debit (Rs)	Credit (Rs)
	P & L Adjustment A/c Dr.		5,740	
	To Motor Car A/c			1,740
	To Suspense A/c			4,000
	(Being the amount of repairs to motor car, Rs. 5,740, wrongly debited to Motor Car A/c as Rs. 1,740, this credit now removed and full debit given to P & L A/c)			

(iv)

Date	Particulars	L.F	Debit (Rs)	Credit (Rs)
	P & L Adjustment A/c Dr.		25,500	
	To M/s N A/c			4,500
	To Suspense A/c			21,000
	(Being effect of credit of Rs. 10,500 to Sales Account instead of debit to Purchases A/c of Rs. 15,000 removed credit to M/s N raisd by Rs. 4,500 to make it Rs. 15,000)			

(v)

Date	Particulars	L.F	Debit (Rs)	Credit (Rs)
	Suspense A/c Dr.		10,800	
	To Mr. X A/c			10,800
	(Being the amount received from Mr. X wrongly posted to his debit, now rectified)			

Q. 7. (a) Following information is available from the books of M/s H.

  (i) **Balance as per passbook on 30-11-2010 overdrawn Rs. 20,000**

  (ii) **On 5-10-2011 M/s H deposited for collection of Rs. 1,000 and made entry in cash which appears in the passbook on 6-12-2010 at Rs. 990.**

  (iii) **Cheques issued to parties but not presented for payment till 30-11-2010 are Rs. 525, Rs. 835 and Rs.900.**

  (iv) **Cheques deposited for collection but not collected by bankers till 30-11-2010 are Rs. 8,760 and Rs. 410. What is the balance as per Cash Book? What is the balance as per Cash Book?**

(b) **M maintains a provision for bad debts at 5% and provision for discount on debtors at 2.5%. It consistently adopts the methods of crediting the bad debts recovered directly to profit and loss account.**

Particulars	Amount (Rs.)
Balances on 1.04.2010 :	
Provision for bad debts	**5,000**
Provision for discount on debtors	**2,375**
During 2010-2011 :	
Bad debts incurred	**1,600**
Discount allowed	**800**
Bad debts recovered	**600**

The debtos after writing off bad debts and discount allowed as on 31-03-2011 amounted to Rs. 1,00,000. Prepare ledgers — Provisions for Discount on Debtors and Provisions for Bad and Doubtful Debts.

Answer 7. (a)

Particulars	Rs.	Rs.
Balance as per Passbook (OD)		20,000
Add : Cheques issued but not presented for payment till 30.11.2010	525	
	835	
	900	
Less : Cheque deposited but collected by bankers after 30.11.2010 and		
appears in the passbook at Rs. 990	1,000	
Cheques deposited but not collected by bankers till 30.11.2010	8,760	
Overdraft Bank Balance as per Cash Book (Cr. Bal.)	410	10,170
Balance as per Cash Book (Credit Balance)		**12,090**

Answer 7. (b)

Provision for Discount on Debtors

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Discount allowed	800	By Balance b/d	2,375
To Balance c/d	2,375	By P & L A/c	800
(2.5% on Rs. 95,000)	3,175		3,175

Provision for Bad and Doubtful Debts

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Bad Debts	1,600	By Balance b/d	5,000
To Balance c/d	5,000	By P & L A/c (balance)	1,600
(5% on Rs. 1,00,000)	6,600		6,600

Q. 8. X purchased goods from Y for Rs. 10,000 on 1st June 2010 and accepted a bill of exchange for 2 months drawn on him by Y on the same date for the amount. B got the bill discounted at his bank at 18%. At maturity the bill was dishonored, the noting charges amounting to Rs. 10. Y agreed to receive from X the sum of Rs. 2,370 and a promissory note of Rs. 8,000 (in full settlement) at 3 months. On due date, X met the not. Give ledger accounts in books of X.

Answer 8.

X's Ledger

Purchases Account

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.			Rs.
June 1	To Y	10,000			

Y's Account

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.			Rs.
June 1	To Bill's Payable A/c	10,000	June 1	By Purchases A/c	10,000
			Aug. 4	By Bill's Payable A/c	10,000
Aug. 4	To Cash	2,370	Aug. 4	Noting Charges A/c	10
Aug. 4	To Bills Payable A/c	8,000	Aug. 4	Interest A/c	360
		20,370			20,370

Bills Payable Account

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Aug. 4	To Y (dishonor)	10,000	June 1	By Y	10,000
Nov. 7	To Bank (payment)	8,000	Aug. 4	By Y	8,000
		18,000			18,000

Noting Charges Account

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.			Rs.
June 1	To Y	10			

Interest Account

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.			Rs.
Aug. 4	To Y	360			

Q. 9. (a) NT of Kolkata has a branch at Darjeeling. The branch does not maintain separate books of accounts. The branch has the following assets and liabilities on 31st August, 2010 and 30th September, 2010 :

	31st August, 2010	*30th September, 2010*
	Rs.	*Rs.*
Stock of tea	4,50,000	3,75,000
Advance to suppliers	12,50,000	11,25,000
Bank Balance	1,87,500	2,50,000
Prepaid expenses	25,000	30,000
Outstanding expenses	32,500	27,500
Creditors for purchases	7,50,000	to be ascertained

During the month, Darjeeling branch :

 (i) received by electronic mail transfer Rs. 25,00,000 from Kolkata head office;

 (ii) purchased tea worth Rs. 30,00,000;

 (iii) sent tea costing Rs. 30,75,000 to Kolkata, freight of Rs. 2,00,000 being payable at the destination by the receiver;

 (iv) spent Rs. 62,500 on office expenses;

 (v) paid Rs. 7,50,000 as advance to suppliers;

 (vi) paid Rs. 16,25,000 to suppliers in settlement of outstanding dues.

In addition, NT informs you that the Kolkata office had directly paid Rs. 875,000 to Darjeeling suppliers by cheques drawn on bank accounts in Kolkata during the month.

NT informs you that for the purpose of accounting, Darjeeling branch is not treated as an outsider. He wants you to write the detailed accounts relating to the transactions of the Darjeeling branch as would appear in the books of Kolkata Head Office.

(b) Head Office passes adjustment entry at the end of each month to adjust the position arising out of inter-branch transactions during the month. From the following inter-branch transactions in November, 2010, make the entry in the books of Head Office :

 (i) **Mumbai Branch**

 (1) **Received Goods: Rs. 9,000 from Kolkata Branch, Rs. 6,000 from Patna Branch.**

 (2) **Sent Goods to Rs. 15,000 to Patna, Rs. 12,000 to Kolkata.**

 (3) **Received B/R : Rs. 9,000 from Patna.**

 (4) **Sent Acceptance: Rs. 6,000 to Kolkata, Rs. 3,000 to Patna.**

 (ii) **Chennai Branch (Apart from the above)**

 (5) **Received Goods: Rs. 15,000 from Kolkata, Rs. 6,000 from Mumbai.**

 (6) **Cash Sent : Rs. 3,000 to Kolkata, Rs. 9,000 to Mumbai.**

 (iii) **Kolkata Branch (Apart from the above)**

 (7) **Sent Goods to Patna : Rs. 9,000.**

 (8) **Paid B/P : Rs. 6,000 to Patna, Rs. 6,000 cash to Patna.**

Answer 9. (a)

Dr.   **Darjeeling Tea Stock Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Sept. 1	To Opening balance	4,50,000	Sept. 30	By Tea in transit to Kolkata	30,75,000
30	To Purchases	30,00,000	30	By Closing stock	3,75,000
		34,50,000			34,50,000

Dr.   **Advance to Darjeeling Supplier's Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Sept. 1	To Opening balance	12,50,000	Sept. 30	By Suppliers—adjustment	8,75,000
30	To Darjeeling bank	7,50,000	30	By Closing balance	11,25,000
		20,00,000			20,00,000

Dr.   **Darjeeling Supplier's Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Sept.30	To Advance to Suppliers — Darjeeling	8,75,000	Sept. 1	By Opening balance	7,50,000
30	To Darjeeling bank	16,25,000	30	By Tea stock (Purchases)	30,00,000
30	To Kolkata Bank	8,75,000			
30	To Balance c/d	3,75,000			
		37,50,000			37,50,000

Dr.   **Darjeeling Bank Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Sept. 1	To Balance b/d	1,87,500	Sept. 30	By Advance to Suppliers	7,50,000
30	To Kolkata Bank A/c	25,00,000	30	By Suppliers	16,25,000
			30	By Expenses	62,500
			30	By Balance c/d	2,50,000
		26,87,500			26,87,500

Dr.   **Darjeeling Bank Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Sept. 1	To Prepaid expenses	25,000	Sept. 1	By Outstanding expenses	32,500
30	To Darjeeling Bank	62,500	30	By Prepaid expenses	30,000
30	To Outstanding expenses	27,500	30	By Branch Profit and Loss	52,500
		1,15,000			1,15,000

Answer 9. (b)

Date	Particulars		Dr. Rs.	Cr. Rs.
2010 Nov 30	Chennai Branch A/c	Dr.	9,000	
	Patna Branch A/c	Dr.	24,000	
	To Mumbai Branch A/c			9,000
	To Kolkata Branch A/c			24,000
	(Being adjustment entry passed by head office in respect of inter-branch transactions during the month.)			

Working Note :

Inter - branch transactions

		Mumbai Rs.	*Chennai* Rs.	*Kolkata* Rs.	*Patna* Rs.
(a)	**Mumbai Branch**				
	(1) Received Goods	15,000 (Dr.)		9,000 (Cr.)	6,000 (Cr.)
	(2) Sent Goods	27,000 (Cr.)		12,000 (Dr.)	15,000 (Dr.)
	(3) Received B/R	9,000 (Dr.)			9,000 (Cr.)
	(4) Sent Acceptance	9,000 (Cr.)		6,000 (Dr.)	3,000 (Dr.)
(b)	**Chennai Branch**				
	(5) Received Goods	6,000 (Cr.)	21,000 (Dr.)	15,000 (Cr.)	
	(6) Cash Sent	9,000 (Dr.)	12,000 (Cr.)	3,000 (Dr.)	
(c)	**Kolkata Branch**				
	(7) Sent Goods			9,000 (Cr.)	9,000 (Dr.)
	(8) Paid B/P and Cash			12,000 (Cr.)	12,000 (Dr.)
		9,000 (Cr.)	9,000 (Dr.)	24,000 (Cr.)	24,000 (Dr.)

Q. 10. (a) On 1st January, 2010 D Ltd., Mumbai, sent on consignment to N Ltd. of Kanpur 100 cases of tea costing Rs. 500 each, invoiced "proforma" at Rs. 600 each. The freight and other charges on the consignment amounted to Rs. 3,100. At the same time, D Ltd. passed the documents through the Bank and drew upon N Ltd. for Rs. 30,000 at 15 days sight and discounted the draft with the Bank for Rs. 29,775. The draft was duly honoured by N Ltd.

On 1st March, 2010, N Ltd. sent Account Sales (together with he necessary remittance) showing that 40 cases had realised Rs. 600 each, and 30 cases Rs. 700 each and that 30 cases remained in stock unsold. The expenses in Kanpur amounted to Rs. 2,500 in respect of the entire consignment. N Ltd. are entitled to a selling commission of 5 per cent.

On 15th March, 2010 N Ltd. informed the consignors that 20 cases were damaged due to bad packing and that they estimated that the selling price of the damaged goods would be about Rs. 200 per case.

Both the firms close their books of account on 31st March. Prepare ledger accounts in the books of (i) D Ltd. and (ii) N Ltd.

Answer 10. (a)

D Ltd. Ledger

Dr.   **Consignment Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Jan. 1	To Goods Sent on		Mar. 1	By N Ltd. — Sales	45,000
	Consignment Account	60,000	" 15	By Abnormal Loss	6,620
"	To Bank — Expenses	3,100	31	By Goods Sent on	
Mar. 1	To N Ltd. — Expenses	2,500		Consignment Account	
"	To N Ltd. — Commission	2,250		— Loading	10,000
15	To Consignment Stock		"	By Consignment Stock	
	Reserve Account	1,000		Account	10,310
31	To Profit & Loss Account				
	— Profit	3,080			
		71,930			71,930

Dr.   **N Ltd. of Kanpur**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Mar. 1	To Consignment Account—		Jan. 1	By Bills Receivable Account	30,000
	Sales	45,000	Mar. 1	By Consignment Account–	
" 31	To Balance c/d	3,000		Expenses	2,500
			" "	By Consignment Account—	
				Commission	2,250
			" "	By Bank	13,250
		48,000			48,000

Dr.   **Bills Receivable Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Jan. 1	To N Ltd.	30,000	Jan. 1	By Bank	29,775
			″ ″	By Discount Account	225
		30,000			30,000

Dr.   **Goods Sent on Consignment Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Mar. 1	To Consignment Account— Loading	10,000	Jan. 1	By Consignment Account	60,000
″ ″	To Trading Account— Transfer	50,000			
		60,000			60,000

Dr.   **Consignment Stock Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Mar. 31	To Consignment Account	10,310	Mar. 31	By Balance c/d	10,310
Apr. 1	To Balance b/d	10,310			

Dr.   **Consignment Stock Reserve Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Mar. 31	To Balance c/d	1,000	Mar. 31	By Consignment Account	1,000
			Apr. 1	By Balance b/d	1,000

Dr.   **Discount Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Mar. 31	To Bills Receivable Account	225	Mar. 31	By Profit & Loss Account —Transfer	225

Working Notes :

(i) *Calculation of abnormal loss* :   Rs.

Cost of 20 cases @ Rs. 500 per case   10,000

Add : Proportionate expense = Rs. 3,100 × $\dfrac{20}{100}$ 620

                                                                                     10,620

Less : Value of 20 cases @ Rs. 200 per case   4,000

                                                                                      6,620

(ii) *Calculation of closing stock* :

Invoice price of 10 cases @ Rs. 600 per case   6,000

Proportionate expense = Rs. 3,100 × $\dfrac{10}{100}$ 310

                                                                                      6,310

Add : Value of 20 cses @ Rs. 200 per case   4,000

                                                                                     10,310

(iii) Since 10 cases have not yet been sold 1/10th of advance has not been adjusted.

N Ltd. Ledger

Dr.   **D Ltd. of Mumbai**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Jan. 1	To Bills Payable Account	30,000	?	By Bank — Sales Proceeds	45,000
?	To Bank—Expenses	2,500	Mar. 31	By Balance c/d	3,000
Mar. 1	To Commission Account	2,250			
" "	To Bank	13,250			
		48,000			48,000
Apr. 1	To Balance b/d	3,000			

Dr.   **Bills Payable Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Jan.31	To Bank	30,000	Jan. 1	By D Ltd.	30,000

Dr.   **Commission Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Mar. 31	To Profit & Loss Account	2,250	Mar. 1	By D Ltd.	2,250

Q. 10. (b) **A and B were partners in a joint venture sharing profits and losses in the proportion of four-fifths and one-fifth respectively. A supplies goods to the value of Rs. 50,000 and incurs expenses amounting to Rs. 5,400. B supplies goods to the value of Rs. 14,000 and his expenses amount to Rs. 800. B sells goods on behalf of the joint venture and realises Rs. 92,000. B is entitled to a commission of 5% on sales. B settles his account by bank draft. Give journal entries and necessary accounts in the books of A.**

Answer 10. (b)

In the Books of A
Journal

		Dr. Rs.	*Cr.* Rs.
Joint Venture Account	Dr.	55,400	
To Trading Account			50,000
To Bank Account			5,400
(Goods sent to B to be sold by him on joint account and expenses incurred in respect goods sent)			
Joint Venture Account	Dr.	14,800	
To B Account			14,800
(The value of goods supplied and expenses incurred by B on joint account)			
B's Account	Dr.	92,000	
To Joint Venture Account			92,000
(Sale proceeds received by B on account of joint venture)			
Joint Venture Account	Dr.	4,600	
To B Account			4,600
(Commission due to B on joint ventures sales at the rate of 5%)			
Joint Venture Account	Dr.	17,200	
To B Account			3,440
To Profit & Loss Account			13,760
(Profit of Rs. 17,200 divided as to 1/5th to B and 4/5the to self— transferred to Profit and Loss Account)			
Bank Account	Dr.	69,160	
To B Account			69,160
(Bank draft received from B in settlement of account)			

Ledger

Dr.   **Joint Venture Account**   Cr.

Particulars	Amount Rs.	Particulars	Amount Rs.
To Trading Account (goods)	50,000	To B (Sales)	92,000
To Bank (expenses	5,400		
To B :			
Goods	14,000		
Expenses	800		
To B (commission)	4,600		
To B (1/5th profit)	3,440		
To Profit & Loss A/c (4/5th profit)	13,760		
	92,000		92,000

Dr.   **B Account**   Cr.

Particulars	Amount Rs.	Particulars	Amount Rs.
To Joint Venture Account (Sales)	92,000	By Joint Venture Account :	
		Goods	14,000
		Expenses	800
		By Joint Venture Account Commission	4,600
		Profit	3,440
		By Bank — bank draft in settlement	69,160
	92,000		92,000

Q. 11. (a) The following trial balance is extracted from the books of a E on 31st December 2010 :

Particulars	Dr. Rs.	Cr. Rs.
Furniture and Fittings	640	
Motor Vehicles	6,250	
Buildings	7,500	
Capital Account		12,500
Bad Debts	125	
Provisions for Bad Debts		200
Sundry Debtors and Creditors	3,800	2,500
Stock on January 1, 2010	3,460	
Purchases and Sales	5,475	15,450
Bank Overdraft		2,850
Sales and Purchases Returns	200	125
Advertising	450	
Interest (on Bank Overdraft)	118	
Commission		375
Cash	650	
Taxes and Insurance	1,250	
General Expenses	782	
Salaries	3,300	
	34,000	34,000

The following adjustments are to be made :

(a) Stock in hand on 31st December 2010 was Rs. 3,250.
(b) Depreciate Buildings at the rate of 5%, Furniture & Fittings @ 10% and Motor Vehicles @ 20%
(c) Rs. 85 is due for interest on bank overdraft.
(d) Salaries Rs. 300 and Taxes Rs. 120 are outstanding.
(e) Insurance amounting to Rs. 100 is prepaid.
(f) One-third of the commission received is in respect of work to be done next year.
(g) Write off a further sum of Rs. 100 as bad debt and provision for bad debts to be made equal to 10 per cent on sundry debtors.

Prepare a Trading and Profit & Loss Account for the year ending 31st December, 2010 and Balance Sheet as on the date.

Answer 11. (a)

Trading and Profit & Loss Account
(*for the year ending 31st December, 2010*)

Particulars		Amount Rs.	Particulars		Amount Rs.
To Opening Stock		3,460	By Sales	15,450	
To Purchases	5,475		*Less* : Sales		
Less : Returns	125	5,350	Returns	200	15,250
To Gross Profit c/d		9,690	By Closing Stock		3,250
		18,500			18,500
To Salaries	3,300		By Gross Pofit b/d		9,690
Add : Outstanding	300	3,600	By Commission	375	
To General Expenses		782	*Less* : Received in advance	125	250
To Taxes & Insurance	1,250				
Add : Outstanding	120				
	1,370				
Less : Prepaid Ins.	100	1,270			
To Depreciation :					
Building (5%)	375				
Furniture & Fitting (10%)	64				
Motor Vehicles (20%)	1,250	1,689			
To Advertising		450			
To Bad Debts	225				
Add : New Provision	370				
	595				
Less : Old Provision	200	395			
To Interest on Bank Overdraft	118				
Add : Outstanding	85	203			
To Net Profit		1,551			
		9,940			9,940

Balance Sheet
(*as on the 31st December, 2010*)

Liabilities		Amount Rs.	Assets		Amount Rs.
Capital	12,500		Buildings	7,500	
Add : Net Profit	1,551	14,051	*Less* : Depreciation	375	7,125
Sundry Creditors		2,500	Furniture	640	
Bank Overdraft	2,850		*Less* : Depreciation	64	576
Add : Interest Due	85	2,935	Motor Vehicles	6,250	
Outstanding Expenses :			*Less* : Depreciation	1,250	5,000
Salaries	300		Stock in trade		3,250
Taxes	120	420	Sundry Debtors	3,700	
Commission Received in			*Less* : Provision for bad debts	270	3,330
Advance		125	Prepaid Insurance		100
			Cash in Hand		650
		20,031			20,031

Q. 11. (b) **From the following figures extracted from the books of C, you are required to prepare a Trading and Profit & Loss Account for the year ended 31st March, 2010 and a Balance Sheet as on that date after making the necessary adjustments :**

Particulars	Rs.	Particulars	Rs.
C's Capital	2,28,800	Stock 1.4.2009	38,500
C's Drawings	13,200	Wages	35,200
Plant and Machinery	99,000	Sundry Creditors	59,400
Freehold Property	66,000	Postage and Telegrams	1,540
Purchases	1,10,000	Insurance	1,760
Returns Outwards	1,100	Gas and Fuel	2,970
Salaries	13,200	Bad Debts	660
Office Expenses	2,750	Office Rent	2,860
Office Furniture	5,500	Freight	9,900
Discount A/c (Dr.)	1,320	Loose Tools	2,200
Sundry Debtors	29,260	Factory Lighting	1,100
Loan to Shri Krishna		Provision for D/D	880
@ 10% p.a. — balance on 1.4.94	44,000	Interest on loan to Sh. Krishna	1,100
Cash at Bank	29,260	Cash on Hand	2,640
Bills Payable	5,500	Sales	2,31,440

Adjustments :

1. **Stock on 31st March 2010 was valued at Rs. 72,600.**

2. **A new machine was installed during the year costing Rs. 15,400 but was not recorded in the books as no payment was made for it. Wages Rs. 1,100 paid for its erection have been debited to wages account.**

3. Depreciate Plant and Machinery by $33\frac{1}{3}\%$

     Furniture by   10%

     Freehold Property by   5%

4. Loose tools were valued at Rs. 1,760 on 31.3.2010.

5. Of the Sundry Debtors Rs. 660 are bad and should be written off.

6. Maintain a provision of 5% on Sundry Debtors for doubtful debts.

7. The manager is entitled to a commission of 10% of the net profits after charging such commission.

Answer 11. (b)

C
Trading and Profit & Loss Account
(*for the year ended 31.3. 2010*)

Particulars		Amount Rs.	Particulars		Amount Rs.
To Stock (1.4.2009)		38,500	By Sales		2,31,440
To Purchase	1,10,000		By Closing Stock		72,600
Less : Returns	1,100	1,08,900			
To Wages	35,200				
Less : Erection of					
Machinery	1,100	34,100			
To Gas and Fuel		2,970			
To Freight		9,900			
To Factory Lighting		1,100			
To Gross Profit c/d		1,08,570			
		3,04,040			3,04,040
To Salaries		13,200	By Gross Profit b/d		1,08,570
To Office Expenses		2,750	By Interest	1,100	
To Postage & Telegrams		1,540	*Add* : O/S	3,300	4,400
To Insurance		1,760			
To Office Rent		2,860			
To Discount		1,320			
To Bad Debt	660				
Add : Addl. Bad Debts	660				
Add : New Provision	1,430				
	2,750				
Less : Old Provision	880	1,870			
To Depreciation :					
Machinery	38,500				
Funriture	550				
Freehold Property	3,300				
Loose Tools	440	42,790			
To Commission to Manager		4,080			
To Net Profit taken to					
Balance Sheet		40,800			
		1,12,970			1,12,970

C
Balance Sheet as at 31.3.2011

Liabilities		Amount Rs.	Assets			Amount Rs.
Capital	2,28,800		Plant & Machinery		99,000	
Add : Net Profit	40,800		*Add* : New Machinery			
	2,69,600		(15,400+1,100)		16,500	
Less : Drawings	13,200	2,56,400			1,15,500	
			Less : Depreciation		38,500	77,000
			Freehold Property		66,000	
Bills Payable		5,500	*Less* : Depreciation		3,300	62,700
Sundry Creditors		59,400	Office Furniture		5,500	
Manager's Commission		4,080	*Less* : Depreciation		550	4,950
Outstanding			Loose Tools		2,200	
			Less : Depreciation		440	1,760
			Closing Stock			72,600
			Sundry Debtors		29,260	
			Less : Bad Debts		660	
					28,600	
			Less : Provision for			
			doubtful debts		1,430	27,170
			Loan to Sh. Krishna		44,000	
			Add : Interest accured			
			and outstanding		3,300	47,300
			Cash at Bank			29,260
			Cash in Hand			2,640
		3,25,380				3,25,380

Q. 12. (a) A trader keeps his books by single entry. During the year 2010 he kept a cash book of which the following is an analysis :

	Rs.
Received from Sundry Debtors	64,000
Additional Capital introduced on 1st October, 2010	8,000
Loan from Z at 16% p.a. on 1st July 2010	10,500
Paid to Sundry Creditors	57,700
General Expenses paid	3,900
Salaries paid	3,000
Drawings	4,000
Deposits in the bank during the year	50,000
Withdrawals from the bank during the year	36,000

The following balances existed on 1st January 2010 :

Sundry Debtors Rs. 15,300; Sundry Creditors Rs. 11,500; Bank Overdraft Rs. 8,000; Building Rs. 42,500; Stock Rs. 21,800; and Cash Balance Rs. 600. The following Balances existed on 31st December 2010:

Sundry Debtors Rs. 16,000; Sundry Creditors Rs. 11,900; and Stock Rs. 26,000.

Depreciate Building by 5% and provide interest on Z's loan.

Prepare Trading and Profit and Loss Account for the year ended 31st December, 2010 and Balance Sheet as on that date. Also prepare Sundry Debtors Account, Sundry Creditors, Cash Account, Bank Account and working notes in full, as part of your answer.

Answer 12. (a)

Trading and Profit & Loss Account
(*for the year ended 31.3. 2011*)

Particulars	Amount Rs.	Particulars	Amount Rs.
To Opening Stock	21,800	By Sales	64,700
To Purchases	58,100	By Closing Stock	26,000
To Gross Profit c/d	10,800		
	90,700		90,700
To Salaries	3,000	By Gross Profit b/d	10,800
To General Expenses	3,900		
To Depreciation	2,125		
To Interest on Loan	840		
To Net Profit transferred to			
Capital Account	935		
	10,800		10,800

Balance Sheet
as on 31st December, 2011

Liabilities		Amount Rs.	Assets		Amount Rs.
Capital		60,700	Building	42,500	
Add : Addn. during the year	8,000		*Less* : Depreciation	2,125	40,375
Add : Net Profit	935	8,935	Stock-in-trade		26,000
		69,635	Sundry Debtors		16,000
Less : Drawings		4,000	Cash at Bank		6,000
		65,635	Cash in Hand		500
Z's Loan	10,500				
Add : Interest	840	11,340			
Sundry Creditors		11,900			
		88,875			88,875

Working Notes :

Sundry Debtors Account

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Jan. 1	To Balance b/d	15,300	Jan. 1	By Cash	64,000
Dec. 31	To Sales (bal. figure)	64,700	Dec. 31	By Balance c/d	16,000
		80,000			80,000

Sundry Creditors Account

Date	Particulars	Amount	Date	Particulars	Amount
2010		Rs.	2010		Rs.
Dec. 31	To Cash	57,700	Jan. 1	By Balance b/d	11,500
" 31	To Balance c/d	11,900	Dec. 31	By Purchases (bal. fig.)	58,100
		69,600			69,600

Cash and Bank Account

Date	Particulars	Cash Rs.	Bank Rs.	Date	Particulars	Cash Rs.	Bank Rs.
2010				2010			
Jan. 1	To Balance b/d	600		Jan. 1	By Balance b/d		8,000
	To Sundry Debtors	64,000			By Creditors	57,700	
	To Z's Loan	10,500			By Bank	50,000	
	To Capital A/c	8,000			By General Exp.	3,900	
	To Cash		50,000		By Salaries	3,000	
	To Bank	36,000			By Drawings	4,000	
					By Cash		36,000
					By Balance c/d	500	6,000
		1,19,100	50,000			1,19,100	50,000

Working Notes :

Balance Sheet
(as on the 31st December, 2011)

Liabilities	Amount Rs.	Assets	Amount Rs.
Capital	60,700	Building	42,500
(balancing figure)		Stock-in-trade	21,800
Bank Overdraft	8,000	Sundry Debtors	15,300
Sundry Creditors	11,500	Cash in Hand	600
	80,200		80,200

Q. 12. (b) T does not maintain his books and accounts according to Double Entry System. From the following ifnormation, prepare Profit and Loss Account and Balance Sheet as at June 30, 2010.

(*a*)	Assets and Liabilities	30.6.2009	30.6.2010
	Stock	19,800	1,13,200
	Creditors	16,000	14,500
	Debtors	1,18,000	1,25,000
	Premises	90,000	90,000
	Furniture	11,000	11,500
	Air Conditioner	15,000	15,000

(*b*) Creditors as at 30.6.2009 includes Rs. 15,000 for purchase of Air Conditioner :

(*c*)	Cash Transactions :	Rs.
	Cash as at July 1, 2009	15,000
	Collections from Customers	1,60,800
	Payments to Creditos (Trade)	1,44,000
	Rent, Rates and Taxes	11,500
	Salaries	1,12,000
	Sundry Expenses	18,000
	Sundry Income	16,500
	Drawings by Thomas	30,000
	Loan from Mrs F	23,000
	Capital introduced	12,000
	Cash Sales	11,500
	Cash Purchases	15,000
	Paid to Creditor for Air Conditioner	15,000
(*d*)	Bad Debts written off	1,200

Answer 12. (b)

Trading and Profit & Loss Account
for the year ended June 30, 2010

Dr.   Cr.

Particulars	Amount Rs.	Particulars	Amount Rs.
To Opening Stock	19,800	By Sales : Cash	11,500
To Purchases: Cash	15,000	Credit	1,69,000
Credit	1,42,500	By Closing Stock	1,13,200
To Gross Profit	1,16,400		
	2,93,700		2,93,700

Particulars	Amount Rs.	Particulars	Amount Rs.
To Salaries	1,12,000	By Gross Profit	1,16,400
To Rent, Rates & Taxes	11,500	By Sundry Income	16,500
To Sundry Expenses	18,000	By Loss for the year transf.	
To Bad Debts	1,200	to Capital A/c	9,800
	1,42,700		1,42,700

Balance Sheet
as at June 30, 2010

Liabilities		Amount Rs.	Assets	Amount Rs.
T Capital Account	2,37,800		Fixed Assets :	
as at 1.6.2009			Premises	90,000
Add : Capital Introduced	12,000		Furniture	11,500
	2,49,800		Air Conditioner	15,000
Less : Drawings	30,000			
	2,19,800		Current Assets :	
Less : Loss for the year	9,800	2,10,000	Stock	1,13,200
Loan from Mrs. F		23,000	Debtors	1,25,000
Bank Balance (Overdraft)		1,07,200		
Sundry Creditors		14,500		
		3,54,700		3,54,700

Working Notes :

(*i*)   **Total Debtors Account**

Particulars	Amount Rs.	Particulars	Amount Rs.
To Balance b/d	1,18,000	By Bank	1,60,800
To Credit (balancing fig.)	1,69,000	By Bad debts	1,200
		By Balance c/d	1,25,000
	2,87,000		2,87,000

(*ii*)   **Total Creditors Account**

Particulars	Amount Rs.	Particulars	Amount Rs.
To Bank	1,44,000	By Balance b/d	16,000
To Balance c/d	14,500	By Purchases	1,42,500
	1,58,500		1,58,500

(*iii*) **Bank Account**

Particulars	Amount Rs.	Particulars	Amount Rs.
To Balance (Opening)	15,000	By Payments to Creditors (Airconditioners)	15,000
To Collections from Customers	1,60,800	By Payments to Creditors (Trade)	1,44,000
To Sundry Income	16,500	By Rent, Rates & Taxes	11,500
To Loan from Mrs. Fernandes	23,000	By Salaries	1,12,000
To Thomas Capital A/c	12,000	By Sundry Expenses	18,000
To Cash Sales	11,500	By Drawings	30,000
To Balance (Overdraft) (balancing figure)	1,07,200	By Cash Purchases	15,000
		By Furniture	500
	3,46,000		3,46,000

(*iv*) **Opening Balance Sheet**
as at July 1, 2009

Liabilities	Amount Rs.	Assets	Amount Rs.
Capital Account (balancing figure)	2,37,800	Fixed Assets :	
		Premises	90,000
Creditors		Furniture	11,000
(including creditors for Air Conditioner Rs. 15,000)	31,000	Air Conditioner	15,000
		Current Assets :	
		Stock	19,800
		Debtors	1,18,000
		Cash	15,000
	2,68,800		2,68,800

Q. 12. (c) Sumit and Amit entered into a Joint Venture to purchase , recondition and sell second hand cars. Sumit purchased 100 cars during the period 1.1.2010 to 30.6.2010 at the following prices and paid for the same :

20 cars @ Rs. 15,000 each; 40 cars @ Rs.25,000 each ; 40 cars @ Rs. 55,000 each. Amit during the same period reconditioned the cars by spending the following amounts :

Spare parts used Rs. 1,80,000; Painting Rs. 2,00,000; Air-conditioning 10 cars Rs. 3,00,000; Testing charges Rs. 20,000; insurance Rs.60,000;Labour charges Rs. 10,40,000. Sumit and Amit sold the cars, the details of which are :

	Sold by	
	Sumit	Amit
A.C. Cars	5	4
Non-A.C. Cars	35	46

A.C. cars were sold at Rs.1,75,000 each. Non-A.C. cars were sold:

Sumit   35 cars @ Rs. 1.25 lakhs each

Amit   35 cars @ Rs. 1.10 lakhs each

                11 cars @ Rs. 0.60 lakhs each

During testing one non-A.C. car met with an accident and the Insurance Company paid the actual cost as claim. Prepare the Joint Venture Account and Account of Amit in the books of Sumit.

Answer 12. (c)

In the books of Sumit

Dr.   **Joint Venture Account**   Cr.

Date	Particulars	Amount	Amount	Date	Particulars	Amount	Amount
?	To Bank A/c				By Bank A/c		
	(Cost of cars		35,00,000		Sales Proceeds		52,50,000
	Purchased			"	Amit A/c		
"	Amit				- Sales Proceeds		52,10,000
	(Reconditioning			"	Insurance claim		50,000
	charges):			"	Closing stock:		
"	Spare parts	1,80,000		"	A. C. car	80,000	
"	Painting	2,00,000		"	Non-A.C. car		
"	Air-conditioning	3,00,000			(8 × Rs. 50,000)	4,00,000	4,80,000
"	Testing charges	20,000					
"	Insurance	60,000					
"	Labour charges	10,40,000	18,00,000				
"	Profit on Venture:						
"	P & L A/c (1/2)	28,45,000					
"	Amit (1/2)	28,45,000	56,90,000				
			1,09,90,000				1,09,90,000

Dr.   **Amit Account**   Cr.

Data	Particulars	Amount	Date Rs.	Particulars	Amount Rs.
?	To Joint Venture A/c		?	By Joint Venture	
	-Sales Proceeds	52,10,000		(Reconditioning Charges)	18,00,000
				Joint Venture A/c	
				(Share of Profit)	28,45,000
				Balance c/d	5,65,000
		52,10,000			52,10,000

Workings :

		Rs.
1.	Cost of Cars Purchased	
	(20 cars × Rs. 15,000)+(40 cars × Rs. 25,000) + (40cars × Rs. 55,000)	<u>35,00,000</u>
2.	Sales Proceeds	
	Sumit- (5 × Rs. 1,75,000) + (35 × Rs. 1,25,0000)	<u>52,50,000</u>
	Amit- (4 × Rs. 1,75,000) + (35 × Rs. 1,10,000) + (11 × Rs. 60,000)	<u>52,10,000</u>
3.	Closing Stock (A.C. Cars + Non-A.C. Cars)	35,00,000
	Purchase Price	
	Add : Reconditioning Charges	<u>15,00,000</u>
		<u>50,00,000</u>
	Cost per Non-A.C. Car = Rs. 50,00,000/100 and,	50,000
	cost of 10 A.C. Cars Rs. 30,00,000/100	30,000
	Total Cost for A.C. cars (50,000 + 30,000)	80,000

4. Actual cost per Non-A.C. car (calculated above) Rs. 50,000, which has been paid by the insurance company.

Q. 13. (a) A firm purchased on 1st January, 2007 certain Machinery for Rs. 58,200 and spent Rs. 1,800 on its erection. On 1st July, 2007 additional machinery costing Rs. 20,000 was purchased. On 1st July, 2009 the machinery purchased on 1st January, 2007 having become obsolete was auctioned for Rs. 28,600 and on the same date fresh machinery was purchased at a cost of Rs. 40,000.

Depreciation was provided for annually on 31st December at the rate of 10 per cent on written down value. In 2010, however the firm changed this method of providing depreciation and adopted the method of providing 5 per cent per annum depreciation on the original cost of the machinery.

Give the Machinery Account as it would stand at the end of each year from 2008 to 2010.

Answer 13. (a)

Dr.   **Machinery Account**   *Cr.*

Date	Particulars	Amount Rs.	Date	Particulars	Amount Rs.
2007			2007		
Jan. 1	To Bank	58,200	Dec. 31	By Depreciation A/c	7,000
	To Bank	1,800		By Balance c/d	73,000
	(erection chargs.)				
July	To Bank	20,000			
		80,000			80,000
2008			2008		
Jan. 1	To Balance b/d	73,000	Dec. 31	By Depreciation A/c	7,300
				By Balance c/d	65,700
		73,000			73,000
2009			2009		
Jan. 1	To Balance b/d	65,700	July 1	By Depreciation	2,430
July 1	To Bank	40,000	Dec. 31	By Bank	28,600
				By Profit & Loss A/c	17,570
				By Depreciation	3,710
				By Balance c/d	53,390
		1,05,700			1,05,700
2010			2010		
Jan. 1	To Balance b/d	53,390	Dec. 31	By Depreciation	3,000
	To Profit & Loss A/c		Dec. 31	By Balance c/d	53,500
	(excess dep. written back)	3,110			
		56,500			56,500

Working Notes :

(i)	Book Value of Machines :	Machine *I* Rs.	Machine *II* Rs.	Machine *III* Rs.
	Cost	60,000	20,000	40,000
	Depreciation for 2007	6,000	1,000	
	Written down value	54,000	19,000	
	Depreciation for 2008	5,400	1,900	
	Written down value	48,600	17,100	
	Depreciation for 2009	2,430	1,710	2,000
	Written down value	46,170	15,390	38,000
	Sale proceeds	28,600		
	Loss on Sale	17,570		

(*ii*) Written down value on the basis of 5% depreciation according to Straight Line Method on 31st Dec. 2009 has been calculated as follows :

	Machine *I* Rs.	Machine *III* Rs.
Cost	20,000	40,000
Depreciation : for 2½ years	2,500	
for ½ year		1,000
	17,500	39,000

Total : Rs. 56,500

(*iii*) The book value appearing in the Books is Rs. 53,390; Rs 3,110 has to be written back to make this figure Rs. 56,500.

(*iv*) The depreciation rate of 10% has been assumed to be per annum.

Q. 13. (b) M/s MW and Wright commenced business on 1st January, 2006 when they purchased plant and equipment for Rs. 7,00,000. They adopted a policy of (i) charging depreciation at 15% per annum on diminishing balance basis and (ii) charging full year's depreciation on additions.

Over the years, their purchases of plant have been :

Date	Rs.
1.8.2007	1,50,000
30.9.2010	2,00,000

On 1.1.2010 it was decided to change the method and rate of depreciation to 10% on straight line basis with retrospective effect from 1.1.2006, the adjustment being made in the accounts for the year ending 31st December, 2010.

Calculate the difference in depreciation to be adjusted in the Plant and Equipment A/c 1.1.2010 and show the ledger account for the year 2010.

Answer 13. (b)

Depreciation on Written Down Value Basis

		Purchased on January 1, 2006	Purchased on August 2007
2006	Cost	7,00,000	
	Depreciation	1,05,000	
	Written Down value (*WDV*) / Cost	5,95,000	1,50,000
2007	Depreciation	89,250	22,500
2008	WDV	5,05,750	1,27,500
	Depreciation	75,863	19,125
2009	WDV	4,29,887	1,08,375
	Depreciation	64,483	16,256
		3,65,404	92,119

	Rs.	Rs.
Depreciation charged	3,34,596 (i)	57,881(ii)
Total depreciation charged (i) + (ii) – (A)	3,92,477	
Depreciation on straight line basis :		
Annual depreciation		
(10% of original cost)	70,000	15,000
No. of years for which depreciation is to be charged	4	3
Total Depreciation	2,80,000(i)	45,000(ii)
Total Depreciation to be charged (i) + (ii) – (B)	3,25,000	
Difference : Excess depreciation charged to be	67,477	
adjusted in 1995 : (A) – (B)		

Dr. **Plant and Equipment Account** *Cr.*

Date	Particulars	Amount Rs.	Date	Particulars	Amount Rs.
2010			2010		
Jan. 1	To Balance b/d (Rs. 8,50,000–Rs. 3,92,477)	4,57,523	Dec. 31	By Depreciation (10%) (on original cost)	1,05,000
Jan. 1	To Profit and Loss A/c (adjustment for depreciation)	67,477		By Balance c/d	6,20,000
Sept.30	To Bank	2,00,000			
		7,25,000			7,25,000

Q. 13. (c) Perfect Pvt. Ltd. has two accounts with Ever Bank ltd. The accounts were known as Account I and Account II.As at Dec 31,2010,the balance as per A/c books reflected the following :

Account I Rs. 1,25,000 Regular balance

Account II Rs. 1,11,250 Overdraft balance.

The accountant failed to tally the balances with Pass Book and the following information was available :

   (a) The Bank has charged Interest on Account II Rs. 11,375 and credited Interest on Account I Rs. 1,250. These were not recorded by the accountant.

   (b) Rs. 12,500 drawn on Dec 10,2011 from Account I was recorded in the books of Account II.

   (c) Bank charges of Rs. 150 and Rs. 1,125 for Account I and Account II were not recorded in the books.

   (d) A deposit of Rs. 17,500 in Account I was wrongly entered in Account II in the books.

   (e) Two cheques of Rs. 12,500 and Rs. 13,750 deposited in Account I, but entered in Account II in the books, were dishonoured. The entries for dishonoured cheques were entered correctly in account II.

(f) **Cheques issued for Rs. 1,50,000 and Rs. 15,000 from Account I and II, respectively, were, not presented until January 5, 2011.**

(g) **Cheques deposited Rs. 1,25,000 and Rs. 1,17,500 in Accounts I and II, respectively, were credited by bank on February 2, 2011.**

Answer 13. (c)

Bank Reconciliation Statement-(Account-I)

as at 31ˢᵗ December 2010

	Particulars	Amount Rs.	Amount Rs.
	Bank balance as per Cash Book		1,25,000
Add :	Interest earned but not recorded in Cash Book	1,250	
	A deposit made into Account I wrongly entered in Account II	17,500	
	Cheques deposited but not entered (Rs.12,500+Rs.13,750)	26,250	
	Cheques issued but not presented for payment	1,50,000	1,95,000
			3,20,000
Less :	A withdrawal from Account I wrongly recorded in Account II	12,500	
	Bank charges debited in Pass Book but not entered in Cash Book	150	
	Cheques dishonoured but not recorded in Cash Book Rs. (12,500+13,750)	26,250	
	Cheques deposited but not credited by Bank	1,25,000	1,63,900
	Bank Balance as per Pass Book		1,56,100

Bank Reconciliation Statement (Account-II)

as at 31ˢᵗ December 2010

	Particulars	Amount Rs.	Amount Rs.
	Overdraft balance as per Cash Book		1,11,250
Add :	Interest charged on overdraft but not entered in Cash Book	11,375	
	Bank charges debited by bank but not entered in Cash Book	1,125	
	A deposit made with Account I wrongly entered in Account II	17,500	
	Cheques deposited bun not credited by the bank	1,17,500	1,47,500
Less :	Withdrawal wrongly recorded	12,500	
	Cheque issued but not presented	15,000	27,500
	Overdraft balance as per Pass Book		2,31,250

Q. 13. (d) **The Trial Balance of M/s Sen & Co., as on 31.3.2011, contained the following items: Reserve for Bad Debts Rs. 12,000; Bad Debts Rs. 8,000 and Sundry Debtors Rs. 1,00,000.**

You are required to show the Provision for bad debts Account assuming that provision for Bad Debts to be created @ 2% on Debtors and further Bad Debt amounted to Rs. 5,000. M/s Sen & Co. closing its account on 31ˢᵗ March, every year.

Answer 13. (d)

Provision for Bad Debts Account

Date	Particulars	Amount	Date	Particulars	Amount
2011 March 31	To Bad Debt A/c (Rs. 12,000+Rs. 5,000) " Balance c/d (2% on Rs. 1,00,000)	17,000 2,000 _____ 19,000	2010 April 1 2011 March 31	By Balance b/d " Profit and Loss A/c (bal fig.) -Further Provision to be created	12,000 7,000 _____ 19,000

Working Notes :

1. The Bad Debt which are given in the Trail Balance has already been adjusted against Sundry Debtors.

2. The further Bad Debt amounting to Rs. 5,000 which are given in the adjustment should be adjusted against Sundry Debtor by passing the following entry

	Rs.	Rs.
Bad Dabt A/c Dr.	5,000	
To, Sundry Debtors A/c		5,000
Total Bad Debt will be Rs. 17,000 (Rs. 12,000 + Rs. 5,000)		

3. The Reserve for Bad Debt which is given in the Trial Balance is the old provision or old reserve. New provision will be calculated, on Closing Debtors = Rs. 2,000 (Rs. 1,00,000 × 2%)

Q. 14. (a) The MM Club's accounts on 31st March. 2009 showed that annual subscriptions outstanding were Rs. 5,000 from 50 members and that subscriptions had been received for 2009-2010 from 20 members. The total number of members on 31st March. 2009 was 1,500. During the year ended 31st March, 2010, 25 members left or died (5 of which were those who owed subscriptions on 31st March, 2009) and 40 others were admitted; they paid Rs. 150 as admission fee; 15 of these paid subscriptions for 2009-2010 as well. The total amount received during 2009-2010 as subscriptions were Rs. 1,47,000.

Prepare the Subscriptions Account and show the amount to be credited or debited to the Income and Expenditure Account for the year ended 31st March, 2010 in respect of the above.

Answer 14. (a)

Dr.   **Subscriptions Account**   *Cr.*

Date	Particulars	Amount Rs.	Date	Particulars	Amount Rs.
2009 Apr. 1 2010 Mar. 31 Mar. 31	To Subscription Outstanding Account-transfer To Subscription Received in Advance A/c (15 members) To Income & Expenditure A/c-transfer of subscriptions pertaining to the year	5,000 1.500 1,51,500 _____ 1,58,000	2009 Apr. 1 2009-10 Mar. 31 Mar. 31	By Subscriptions Received in Advance A/c-transfer By Bank By Income & Expenditure A/c -subscriptions irrecover- able for 5 members By Subscriptions Outstanding A/c-working note	2,000 1,47,000 500 8,500 _____ 1,58,000

Working Note :

Subscriptions Outstanding on March, 31, 2010-	No.	Rs.	Rs.
No. of members on March, 31, 2009	1,500		
New admission	40		
	1,540		
Less : Withdrawals and deaths	25		
No. of members on 31st March, 2010	1,515		
Total amount receivable @ Rs. 100 for 1,515 members			1,51,500
Add : Receivd in Advance on 31st March, 2010			1,500
Outstanding on 31st March, 2009 (good)			4,500
			1,57,500
Less : Received in cash during the year		1,47,000	
Received in Advance on March 31, 2009		2,000	1,49,000
			8,500

Q. 14. (b) TC Cricket Club gives you the following Receipts and Payments Account for the year ended 31st March, 2010.

Receipts	Rs.	Rs.	Payments	Rs.	Rs.
To Balance of cash on			By Salaries and wages		12,000
1st April 2009:			By Sports Equipments		46,785
At Office	150		By Stationery and Printings		1,220
At Bank	14,200	14,350	By Maintenance of Ground		6,000
To Subscriptions		61,100	By Prizes		1,060
To Admission Fees		350	By Balance of cash on		
To Interest on Investment			31st March, 2010		
@ 9% per annum for		9,000	At Office	380	
full year			At Bank	17,355	17,735
		84,800			84,800

The following additional information is provided to you :

	On 1st April, 2009	On 1st April, 2010
(i) Subscription	480	560
(ii) Subscriptions Received in Advance	80	40
(iii) Sports Equipment	21,800	29,700
(iv) Land and Buildings (Cost less depreciation)	80,000	76,000

Prepare Income and Expenditure Account for the year ended 31st March, 2010 and Balance Sheet as at that date.

Answer 14. (b)

Dr. **Income and Expenditure Account of TC Cricket Club for the year ended 31st March, 2010.**   *Cr.*

Particulars	Amount Rs.	Particulars	Amount Rs.
To Salaries and Wages	12,000	By Subscriptions	
To Sports Equipment Used		(Working Note No. 3)	61,220
(Working Note No. 2)	38,885	By Admission Fees	350
To Stationery and Printing	1,220	By Interest on Investments—	
To Maintenance of Ground	6,000	@ 9% poer annum on Rs. 1,00,000	9,000
To Prizes	1,060		
To Depreciation on Land & Buildings			
(Rs. 80,000 – Rs. 76,000)	4,000		
To Surplus i.e. Excess of Income over			
Expenditure	7,405		
	70,570		70,570

Balance Sheet of Gavaskar Cricket Club as at 31st March, 2010

Liabilities	Amount Rs.	Assets		Amount Rs.
Capital Fund :		Land and Buildings	80,000	
Balance as on 1st April, 2009		*Less* : Depreciation for		
(Working Note No. 1) 2,16,550		the year	4,000	76,000
		Sports Equipments		29,700
Add : Surplus for the year 7,405	2,23,955	Investments		1,00,000
Subscriptions Received in	40	Subscription Due		560
Advance		Cash at Bank		17,355
		Cash at Office		380
	2,23,995			2,23,995

Working Notes :

(*i*)   **Balance Sheet of TC Cricket Club as on 1st April, 2009**

Liabilities	Amount Rs.	Assets	Amount Rs.
Subscriptions Received in Advance	80	Land and Buildings	80,000
Capital Fund (balancing figure)	2,16,550	Investments	1,00,00
		Stock of Sports Equipment	21,800
		Subscriptions Due	480
		Cash at Bank	14,200
		Cash at Office	150
	2,16,630		2,16,630

(*ii*) *Calculation of Sports Equipment Used :*   **Rs.**

Stock of Sports Equipment on 1st April, 2009	21,800
Add : Sports Equipment purchased during the year 2009-2010	46,785
	68,585
Less : Stock of Sports Equipment on 31st March, 2010	29,700
	38,885

(*iii*) *Calculation of Income on account of Subscriptions :*

Amount received during the year		61,100
Add : Subscriptions Received in Advance as on 1st April, 2009		80
Subscriptions Due as on 31st March, 2010		560
	Rs.	61,740
Less : Subscription Received in Advance as on 31st March, 2010	40	
Subscriptions Due as on 1st April, 2009	480	520
		61,220

Q. 14. (c) Dhakeshwari Traders of Kolkata purchased 10,000 sarees @ Rs. 100 per saree. Out of these 6,000 sarees were sent on consignment to Lakshmi Traders of Jodh pur at the selling price of Rs. 120 per saree. The consignors paid Rs. 3,000 packing and freight.

Lakshmi Traders sold 5,000 sarees @ Rs. 125 each and incurred Rs. 1,000 for selling expenses and remitted Rs.5,00,000 to Kolkata on account. They are entitled to a commission of 5% on total sale plus a further of 25% commission on any surplus price realised over Rs. 120 per saree.

3,000 sarees were sold at Kolkata @ Rs. 110 per saree.

Owing to fall in market price, the value of stock of saree in hand is to be reduced by 8%.

Prepare : (i) Consignment Account, (ii) Lakshmi Traders Account, (iii) Trading and Profit & Loss Account.

Answer 14. (c)

In the books of Dhakeshwari Traders

Dr.   **Consignment to Jodhpur Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount

?	To Goods sent on
	    consignment A/c
	    (6,000 × Rs.100)
		6,00,000		By National Traders A/c
				   - Sales proceeds
				   (5,000 × Rs. 125)
					6,25,000

	" Bank A/c - Packing and Freight	3,000		" Stock on Consignment A/c	87,500**

	" Lakshmi Traders A/c
	    - Selling Expenses
	    - Commission
		1,000
		37,500*			

	" Profit and Loss A/c - Profit on consignment transferred	71,000			
		7,12,400			7,12,400

*   3,000 sarees, which were sold at Kolkata @ Rs.110 per saree, are not to be taken into consideration since it is not consignment transaction and, hence, the same is excluded from Consignment Account.

** Although the consignor purchased 10,000 sarees, only 6,000 sarees are related to consignment transaction, balance is not to be taken into Consignment account at all.

Dr.   **Lakshmi Traders Account**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
?	To Consignment to Jodhpur A/c - Sales proceeds	6,25,000	?	By Bank A/c - Advance " Consignment to Jodhpur A/c - Exp. & Com. " Balance c/d	5,00,000 38,500 86,500
		6,25,000			6,25,000

Dr.   **Trading Account and Profit and Loss Account *for the year dended* ......**   *Cr.*

Date	Particulars	Amount	Date	Particulars	Amount
?	To Purchase A/c (10,000 × Rs. 100) " Gross Profit c/d	10,00,000 17,400	?	By Sales A/c (3,000 × Rs. 110) " Goods sent on consignment A/c (6,000 × Rs. 100) " Unsold Stock A/c	3,30,000 6,00,000 87,400
		10,17,400			10,17,400
	To Capital A/c - Net Profit transferred	88,300		By Gross Profit b/d " Consig. to Jodhpur A/c - Profit	17,400 70,900
		88,300			88,300

Workings :

1. **Calculation of commission Payable to Lakshmi Traders**   **Rs.**

Total Sales @ Rs. 125	6,25,000
Less : Sales over Rs. 120	6,00,000
Surplus Price Realised	25,000
@ 5% on total Sales	
Rs. 6,25,000 × 5%	31,250
Add : 25% on Rs. 25,000	6,250
	37,500

2. **Valuation of Unsold Stock**

Since market price has fallen by 8% valuation of unsold
stock on consignment will be calculated as :

	Rs.
Total Cost (1,000 × Rs. 100)	1,00,000
(without consideration expenses)	
Less : 8 % Reduction	8,000
	92,000
Less : Consignee's Commission @ 5%	4,600
Estimated selling price	87,400

Q. 15. (a) Mr. S operates two Bank Accounts both of which are maintained in the Columnar Cash Book itself. You are required to draw up a proforma of the Cash Book and show how the following transactions relating to 28th February, 2010 will appear therein and close the Cash Book for the day :

   (1) Opening Balances :

Cash	Rs. 150
N Bank	Rs. 11,240 (O/D)
O Bank	Rs. 35,460

   (2) Received cheque for Rs. 1,250 in respect of sales for realising which the N Bank charged Rs. 1.50 and credited the balance.

   (3) Purchased goods for Rs. 13,210 and a cheque issued on the O Bank.

   (4) Paid office expenses: Rs. 45 and 15.50 for stationery.

   (5) Out of cash sales of Rs. 13,265 a sum of Rs. 10,000 was deposited in the N Bank.

   (6) Credit purchases of Rs. 15,000 were made from Mr M who sent the documents relating to the goods though the O Bank for 90 percent of their value. The bank charged Rs. 115 for releasing the documents.

   (7) Deposited Rs. 5,000 in N Bank.

   (8) A "Bills Receivable" for Rs. 10,000 was discounted with the O Bank, which charges 1 per cent towards discounting.

   (9) Withdrew Rs. 5,000 from the O Bank.

   (10) A demand draft was purchased for Rs. 3,000 from a bank after paying Rs. 2 towards their charges and paid to the Electricity Department as a deposit.

   (11) Interest of Rs. 122 and Rs. 50 were credited and debited respectively by the O Bank and N Bank.

   (12) An amount of Rs. 1,500 was withdrawn from the O Bank and salaries paid to that extent.

Answer 15. (a)

Dr.   **Cash Book**   *Cr.*

Date	Particulars	L.F.	N Bank Rs.	O Bank Rs.	Cash Rs.	Discount	Date	Particulars	L.F.	N Bank Rs.	O Bank Rs.	Cash Rs.
2010							2010					
Feb. 28	To Balance b/d			35,460	150		Feb. 28	By Balance b/d		11,240		
	To Sales A/c		1,250					By Bank Charges A/c		1.50		
	To Sales A/c				13,265			By Purchases A/c			13,210	
	To Cash	'C'	10,000					By Office Expenses				45.00
	To Cash	'C'	5,000					By Stationery A/c				15.50
	To Bills							By N Bank	'C'			10,000
	Receivable A/c			9,900		100		By Mr. M			13,500	
	To O Bank	'C'			5,000			By Bank Charges A/c			115	
	To Interest A/c			122				By N Bank	'C'			5,000
	To O Bank	'C'			1,500			By Cash	'C'		5,000	
	To Dividend A/c			1,250				By Electricity				
	To O Bank	'C'	1,500					Deposit A/c				3,000
								By Bank Charges A/c				2.00
								By Interest A/c		50		
								By Cash	'C'		1,500	
								By Salaries A/c				1,500
								By N Bank	'C'		1,500	
								By Balance c/d		5,458.50	11,807	352.50
	Total		17,750	46,732	19,915	100		Total		17,750	46,732	19,915
Mar. 1	To Balance b/d		5,458.50	11,907.00	352.50							

Q. 15. (b) Write the analytical Petty Cash Book from the following transactions (on imprest system)

			Rs.
Jan.	1	Received from the Bank as imprest cash balance	100
"	7	Bought Postage Stamps	20
"	10	Paid for Stationery	29
"	15	Paid for Charge	4
"	20	Paid Taxi hire	5
"	22	Paid tips to office peons	9
"	23	Paid to S against his account	13
"	27	Paid for Stationery purchased	10
"	30	Paid for tea to travel agent	3

Answer 15. (b)

Dr.   **Petty Cash Book**   *Cr.*

Receipts (Rs.)	Date		Particulars	Voucher	Total Rs.	Conveyance Rs.	Cartage Rs.	Postage Rs.	Stationery	Misc. Rs.
100	Jan.	1	To Bank							
	"	7	By Postage Stamps		20			20		
	"	10	By Stationery		29				29	
	"	15	By Cartige		4		4			
	"	20	By Taxi Fare		5	5				
	"	22	By Tips to Peons		9					9
	"	23	By S (or his A/c)*		13					13
	"	27	By Stationery		10				10	
	"	31	By Tea to Travel Agent		3					3
					93	5	4	20	39	25
			By Balance c/d		7					
100					100					
7	Feb.	1	To Balance b/d							
93			To Bank							

* Note : Paid to 'S' agianst his acount Rs. 13 has been entered in the miscellaneous column. The Petty Cashier should not have made this payment. It may further be noted that any payment to a creditor, however, small the amount may be, should not be entered in the Petty Cash Book.

Q. 15. (c) Mr. David draws two bills of exchange on 1.1.2011 for Rs.6,000 and Rs. 10,000. The bill of exchange for Rs. 6,000 is for 2 months while the bill of exchange of Rs. 10,000 is for 3 months. These bills are accepted by Mr. Thomas. On 4.3.2011 Mr. Thomas Requests Mr. David to renew the first bill with interest @ 18% p.a. for period of 2 months . Mr. David agrees to this proposal. On 20.3.2011 Mr. Thomas retires the acceptance for Rs. 10,000, the interest rebate, i.e, discount, being Rs. 100. Before the due date of the renewed bill, Mr. Thomas become insolvent and only 50 paise in a Rupee could be recovered from his estate. You are to give the journal entries in the books of Mr. David.

Answer 15. (c)

In the books of Mr. Thomas

journal

Date 2010	Particulars		L.F	Debit Rs.	Credit Rs.
Jan 1	Bills Receivable A/c	Dr.		6,000	
	To, Mr. Thomas A/c				6,000
	(Bill drawn for 2 months)				
?	Bills Receivable A/c	Dr.		10,000	
	To, Mr. Thomas A/c				10,000
	(Bill drawn for 3 months)				
Mar. 4	Mr. Thomas A/c	Dr.		6,000	
	To, Bills Receivables A/c				6,000
	(Bills dishonoured at maturity)				
	Mr. Thomas A/c	Dr.		180	
	To, Interest A/c				180
	(Interest receivable on fresh bill)				
	Bills Receivable A/c	Dr.		6,180	
	To, Mr. Thomas A/c				6,180
	(Bill drawn for 2 months)				
" 20	Bank A/c	Dr.		9,900	
	Rebate Allowed A/c	Dr.		100	
	To, Bills Receivable A/c				10,000
	(Bill retired at a rebate of Rs. 100)				
May 7	Mr. Thomas A/c	Dr.		6,180	
	To, Bills ReceivableA/c				6,180
	(First bill dishonoured at maturity)				
?	Bank A/c	Dr.		3,090	
	Bad Debt A/c	Dr.		3,090	
	To, Mr. Thomas A/c				6,180
	(50% of the amount realised from Thomas as he became insolvent)				

Q. 15. (d) Rectify the following errors , assuming that these were detected after preparing Trial Balance :

    (a) Interest received Rs. 300 was credited to Commission Account.

    (b) Purchased plant for Rs. 4,000, wrongly debited to Purchase Account.

    (c) Sold old Furniture for Rs. 800,wrongly credited to Sales Account.

    (d) Rs. 2,000 salary paid to Mr. B. Bose ,stands debited to his personal Account.

    (e) Rs. 1,000 paid to B Bros. against our acceptance , were debited to B. Bros. Account.

    (f) Purchase of goods for the consumption of the proprietor was debited to Purchase Account for Rs. 800.

Answer 15. (d)

In the books of…………..

Journal

Date	Particulars		L.F	Debit Rs.	Credit Rs.
?	(a) Commission A/c 　　　To Interest A/c (Interest received but wrongly credited to Commission Account, now rectified)	Dr.		300	300
	(b) Plant A/c 　　　To Purchase A/c (Plant purchased but wrongly debited to Purchases Account, now rectified)	Dr.		4,000	4,000
	(c) Sales A/c 　　　To Furniture (Old) A/c (Old furniture sold but wrongly credited to Sales Account, now rectified)	Dr.		800	800
	(d) Salary A/c 　　　To B. Bose A/c (Salary paid to B. Bose, wrongly debited to his account, now rectified)	Dr.		2,000	2,000
	(e) Bills Payable A/c 　　　To B. Bros. A/c (Accepted paid but wrongly debited to B. Bros Account, now rectified)	Dr.		1,000	1,000
	(f) Drawings A/c 　　　To Purchases A/c (Goods purchase for private consumption, wrongly debited to Purchases Account, now rectified)	Dr.		800	800

Section II : Cost Accounting

Q. 16. Select the correct answer :

  (i) One of the important tools in cost planning is :
   (a) Direct cost
   (b) Cost sheet
   (c) Budget
   (d) Marginal costing.

  (ii) Fixed cost per unit increases when :
   (a) Variable cost per unit increases.
   (b) Variable cost per unit decreases
   (c) Production volume increases.
   (d) Production volume decreases.

  (iii) The three major elements of product cost are all but :
   (a) Direct materials
   (b) Direct labour
   (c) Factory overhead
   (d) Indirect labour

  (iv) Conversion cost is equal to the total of :
   (a) Material cost and direct wages.
   (b) Material cost and indirect wages.
   (c) Direct wages and factory overhead
   (d) Material cost and factory overhead

  (v) Cost of goods sold includes :
   (a) Cost of production and work in progress
   (b) Cost of production and finished goods inventory
   (c) Cost of production, WIP, and finished goods inventory
   (d) WIP and finished goods inventory

  (vi) Which of the following is an accounting record?
   (a) Bill of material
   (b) Bin card
   (c) Stores ledger
   (d) All of the above.

  (vii) According to which of the following methods of pricing, issues are close to current economic values?
   (a) LIFO
   (b) FIFO
   (c) Highest in first out
   (d) Weighted average price.

(viii) Which of the following items of cost is not a direct material?

    (a) Sand paper used in production.

    (b) Thread used in stitching garments.

    (c) Electricity representing 85% of total cost.

    (d) All the above.

(ix) Which of the following is a service department?

    (a) Refining department

    (b) Receiving department

    (c) Machining department

    (d) Finishing department

(x) Factory overhead should be absorbed on the basis of :

    (a) Relationship to cost incurred.

    (b) Direct labour cost

    (c) Direct labour hours

    (d) Machine hours.

(xi) Labour turnover is measured by :

    (a) Number of workers replaced / Average number of workers.

    (b) Number of workers left/number in the beginning plus number at the end.

    (c) Number of workers joining/ number in the beginning of the period.

    (d) None of these.

(xii) Input in a process is 5000 units and normal loss is 20%. Output of the process is 4040 units.

    (a) There is abnormal loss of 40 units.

    (b) There is abnormal gain of 40 units.

    (c) There is neither abnormal loss nor gain.

    (d) There is normal loss of 960 units.

(xiii) An under-statement of closing W-I-P inventory will :

    (a) Understate cost of goods produced.

    (b) Understate net profit.

    (c) Overstate gross profit.

    (d) Overstate current assets.

(xiv) Costing Profit and Loss Account does not record the :

    (a) Sales value of goods.

    (b) Balance of cost of sales account.

    (c) Balance of overhead adjustment account.

    (d) Balance of stores ledger control account.

(xv) Which of the following accounts make the cost ledger self-balancing?

    (a) Overhead adjustment A/c

    (b) Costing P & L A/c

    (c) Cost Ledger Control A/c

    (d) None of the above.

Answer 16.

   (i) (c) Budget.

  (ii) (d) Production volume decreases.

 (iii) (d) Indirect labour.

 (iv) (c) Direct wages and factory overhead.

  (v) (b) Cost of production and finished goods inventory.

 (vi) (c) Stores ledger.

(vii) (a) LIFO.

(viii) (d) All the above.

 (ix) (c) Machining department.

  (x) (a) Relationship to cost incurred.

 (xi) (a) Number of workers replaced / Average number of workers.

 (xii) (b) There is abnormal gain of 40 units.

(xiii) (b) Understate net profit.

(xiv) (d) Balance of stores ledger control account.

 (xv) (c) Cost Ledger Control A/c.

Q. 17. State with reasons whether the following statements are *True / False* :

   (a) Direct wages is a variable cost.

   (b) Fixed cost per unit varies when output changes.

   (c) Cost and expense are synonymous.

   (d) Normal material losses are charged to Costing Profit and Loss A/c.

   (e) When prices are rising LIFO method shows higher profit.

   (f) Supervisor is a director worker.

   (g) Under Rowan Plan, bonus is a fixed percentage.

   (h) Bad debts do not form part of cost.

   (i) Cost of after sales service is a distribution cost.

   (j) In a cost sheet, opening and closing work in progress is adjusted in the cost of production.

   (k) Fixe cost = Contribution – Variable Cost.

   (l) BEP point can be studied in a profit volume chart.

  (m) Standard costing aims at achieving maximum efficiency, hence standards should be based on ideal performance.

  (n) Journal entry for over absorbed administrative overhead amount in control accounts is to Credit Administration Overhead A/c and Debit Overhead Adjustment A/c.

   (o) There is a clear cut division between joint products and by products.

Answer 17.

  (a) **True** — Direct wages can be identified with a cost unit.

  (b) **True** — Fixed cost is period cost and remains unchanged for particular level of output. So per unit cost changes with output.

  (c) **False** — Cost represents the resources that have been sacrificed to attain a particular objective. Expense is expired cost that has matching economic benefit.

  (d) **False** — Normal losses forms part of cost.

(e) **False** — Under this method, inventory is valued at the oldest price, and materials are issued at current price. So this method, shows a lower profit at higher prices.

(f) **False** — Supervisor is not part of Direct Labour.

(g) **False** — Bonus = T × R × [(S-T)/S)], where T = Time taken, R = Time rate, S = Standard Time.

(h) **True** — Bad debts is a financial loss and is taken to Costing P/L A/C.

(i) **False** — If the costs are incurred within guarantee period, it is treated as production overhead absorbed into product cost. If incurred after guarantee period, such costs are booked against the service rendered.

(j) **False** — They are adjusted in Factory or Works Cost.

(k) **False** — Fixed Cost = Contribution – Profit.

(l) **True** — The point at which total sales and total cost lines intersect in the BEP level.

(m) **False** — In order to achieve maximum efficiency, standards should be based on expected performance.

(n) **False** — The entry is to Debit Administration Overhead A/c and Credit Overhead Adjustment A/c.

(o) **False** — The point of distinction of Joint product and By-products is a question of commercial importance. A joint product today may become by-product tomorrow depending on changing market condition.

Q. 18. Fill in the blanks :

 (i) **The aggregate of indirect materials, indirect labour and indirect expenses is known as _____ .**

 (ii) **_____ costs are hypothetical costs which are not actually incurred but used only for decision making by management.**

 (iii) **_____ represents that quantity of material which is normally purchased when materials reach ordering level.**

 (iv) **The two perpetual inventory records are _____ and _____ .**

 (v) **Materials turnover is a ratio of _____ to _____ .**

 (vi) **In _____ technique of material control, materials are classified according to their value.**

 (vii) **Wage sheet is prepared by _____ department.**

 (viii) **In Halsey Bonus Plan, a worker gets a bonus equal _____ of the time saved.**

 (ix) **When overtime is worked due to seasonal pressure of work, the overtime premium should be treated as _____ .**

 (x) **Allotement of overheads to cost units is known as _____ .**

 (xi) **When there is loss on incomplete contract, it is transferred to _____ .**

 (xii) **Finished Goods produced during a period are transferred from _____ Account to Finished Stock Ledger A/c.**

 (xiii) **_____ is the difference between sales and variable cost.**

 (xiv) **Profit/ Volume ratio shows the relationship between _____ and _____ .**

 (xv) **When fixed cost reduces, margin of safety _____ .**

Answer 18.

 (i) overhead

 (ii) Imputed

 (iii) Reorder quantity

(iv) bin card, stores ledger

(v) materials consumed during the period, average stock

(vi) ABC

(vii) Payroll

(viii) 50%

(ix) overhead

(x) absorption

(xi) Profit & Loss A/c

(xii) W-I-P

(xiii) Contribution

(xiv) contribution, value of sales

(xv) improves

Q. 19. (a) Given below is a list of ten industries. Give the method of costing and the unit of cost against each industry.

(i) Nursing Home

(ii) Road Transport

(iii) Steel

(iv) Brick - works

(v) Bicycles

(vi) Bridge Construction

(vii) Interior Decoration

(viii) Advertising

(ix) Furniture

(x) Sugar company having its own sugarcane fields.

(b) Distibguish between :

(i) Cost Centre and Profit Centre

(ii) BOM and MRN

(iii) Estimated cost and standard cost

Answer 19. (a)

	Industry	*Method of costing*	*Unit of cost*
(i)	Nurshing Home	Operating	Per Bed per week or per day
(ii)	Road transport	Operating	Per Tonne Kilometer or per mile
(iii)	Steel	Process	Per Tonne
(iv)	Brick – works	Single or output	1,000 bricks
(v)	Bicycles	Multiple	Each unit
(vi)	Bridge construction	Contract	Each contract
(vii)	Interior Decoration	Job	Each Job
(viii)	Advertising	Job	Each job
(ix)	Furniture	Multiple	Each unit
(x)	Sugar company having its own sugar-cane fields	Process	Per Quintal/Tonne

Answer 19. (b)

(i)

Cost Centre	Profit Centre
A Cost Centre is the smallest segment of activity or the area of responsibility for which costs are accumulated.	A Profit Centre is that segment of activity of a business which is responsible for both revenue and expenses and discloses the profit of a particular segment of activity.
Cost Centres are created for accounting convenience of costs and their control.	A profit centre is created because of decentralisation of operations.
A Cost Centre does not have target costs but efforts are made to minimise costs.	Each profit centre has a profit target and enjoys authority to adopt such policies as are necessary to achieve its targets.

(ii)

BOM (Bill of Materials)	MRN (Material Requisition Note)
It is a comprehensive list of materials with exact description and specifications, required for a job or other production units. This also provides information about required quantities so that if there is any deviation from the standards, it can easily be detected. It is prepared by the Engineering or Planning Department in a standard form.	It is a formal written demand or request, usually from the production department to store for the supply of specified materials, stores etc. It authorises the storekeeper to issue the requisitioned materials and record the same on bin card.
The purpose of bill of material is to act as a single aurhorisation for the issue of all materials and stores items mentioned in it. It provides an advance intimation to store department about the requirements of materials. It reduced paper work. It surves as a work order to the production department and a document for computing the cost of material for a particular job or work order to the cost department.	The purpose of material requisition note is to draw material from the store by concerned departments.

(iii)

Estimated cost	Standard cost
Kohler defines estimated costs as 'the expected cost of manufacture or acquisition, often in terms of a unit of product computed on the basis of information available in advance of actual production or purchase' Estimated cost are prospective costs since they refer to prediction of costs.	Standard Cost means a pre-determined cost. It attempts to show what the cost should be for clearly defined conditions and circumstances. Standard costs represent' planned cost of a product. They are expected to be achieved under a particular production process under normal conditions.'

Q. 20. (a) A factory uses a job costing system. The following cost data are available from the books for the year ended 31st March, 2011 :

	Rs.
Direct Material	9,00,000
Direct Wages	7,50,000
Profit	6,09,000
Selling and Distribution Overhead	5,25,000
Administrative Overhead	4,20,000
Factory Overhead	4,50,000

Prepare a Cost Sheet indicating the prime cost, works cost, production cost, cost of sales and sales value.

Answer 20. (a)

COST SHEET

For the jobs carried out by the concern for the year ending on 31st March, 2011.

	Rs.
Direct Materials	9,00,000
Direct Wages	7,50,000
Prime Cost	16,50,000
Factory Overhead	4,50,000
Works Cost	21,00,000
Administrative Overhead	4,20,000
Production Cost	25,20,000
Selling and Distribution Overhead	5,25,000
Cost of Sales	30,45,000

Q. 20. (b) The books of ABC Company present the following data for the month of April, 2011.

Direct labour cost Rs. 17,500 being 175% of works overheads.

Cost of goods sold excluding administrative expenses Rs. 56,000.

Inventory accounts showed the following opening and closing balances :

	April 1 Rs.	April 30 Rs.
Raw materials	8,000	10,600
Works in progress	10,500	14,500
Finished goods	17,600	19,000

Other data are :		Rs.
Selling expenses		3,500
General and administration expenses	2,500	
Sales for the month		75,000

You are required to compute the value of materials purchased.

Answer 20. (b)

Computation of the value of materials purchased

	Rs.
Cost of goods sold	56,000
Add : Closing stock of finished goods	19,000
	75,000
Less : Opening stock of finished goods	17,600
Cost of goods manufactured	57,400
Add : Closing stock of works-in-progress	14,500
	71,900
Less : Opening stock of work-in-progress	10,500
Works Cost	61,400
Less : Factory Overhead: $\left(\dfrac{100}{175} \text{ of Direct Labour Cost}\right)$	10,000
Prime Cost	51,400
Less : Direct Labour	17,500
Raw materials consumed	33,900
Add : Closing stock of raw materials	10,600
Raw materials available	44,500
Less : Opening stock of raw materials	8,000
Value of materials purchased	36,500

Q. 21. (a) Discuss briefly how the following items are to be treated in Cost Accounts :

    (i) Carriage inwards raw materials

    (ii) Storage losses

    (iii) Cash discount received

    (iv) Insurance costs on stocks of raw materials.

    (v) Scrap

Answer 21. (a)

  (i) **Carriage inwards on raw materials :** It represents the expenditure incurred in bringing raw materials to factory from outside. This expense is directly allocated to materials and thus forms a part of the cost of such materials. When this is not practicable and allocation to specific items of materials is difficult, the expense is treated as manufacturing overhead and is charged to cost of production at a predetermined rate.

 (ii) **Storage losses :** The losses arising out of storage of material can be classified into two categories. The treatment of losses under each category in Cost Accounts is as under :-

  (A) Losses due to reasons like evaporation, shrinkage, absorption and moisture, etc. are considered as normal losses. Such losses are absorbed by good production units by inflating the cost of material issued for production.

  (B) Losses due to fire, flood, storm, theft etc. are treated as abnormal losses. If these losses are heavy and are not recoverable from the insurance authorities, it is preferred to charge them to Costing Profit and Loss Account.

(iii) **Cash discount received :** It is an allowance given by the vendor for prompt payment of material price.

The opinion among accountants about its treatment differs. Two prevalent approaches for treating the cash discount received are as follows :-

(A) The cash discount received in the course of materials buying should be deducted from the invoice price of the materials. This way the discount received will reduce the purchase price of the materials.

(B) It may be treated as an item of financial nature and therefore be kept outside the purview of cost accounting. However, it can be dealt in the following manner.

The full invoice price should be charged to the material account crediting the suppliers with the net invoice price, and the discount earned account with the amount of cash discount received. If the prompt payment could not be made, the discount lost is debited to the discount lost account. Any difference between the discount earned and discount lost may be treated as an item of administrative overhead.

(iv) **Insurance costs on stocks of raw materials :** The amount paid as insurance costs (insurance premium) on stocks of raw materials is meant for covering the risk which may arise due to fire, theft, riot etc. The insurance cost is apportioned over different materials on the basis of their value. This cost may be charged directly to the cost of material.

(v) **Scrap :** The incidental residue arising from the manufacturing operations, small in quantity and low in value, recoverable without further processing. Scrap may be treated in Cost Accounts in the following ways :

(A) Where the value of scrap is negotiable, it may be excluded from costs. In other words, the cost of scrap is borne by good units and income from scrap is treated as other income.

(B) If the scrap value is considerable, the net sale proceeds of scrap (Gross sales proceeds of scrap-the cost of selling scrap) is deducted from the material cost or factory overhead. Under this method the material cost or factory overhead recovery rate are reduced on account of sale proceeds of scrap. However, no distinction is made between various processes or jobs.

(C) Where the various jobs or processes give rise in varying amount of scrap, the scrap from each job or process is recorded separately and the sale proceeds from the same credited to the particular job or process. This method is useful where scrap is of considerable value and does not arise uniformly.

However, this would necessitate the scrap being identified with various jobs or processes. For this purpose details records for scrap will be required.

Q. 21. (b) S E Ltd. manufactures a special product "Y". The following particulars were collected for the year 2011 :

(a) **Monthly demand of "Y" - 1,000 units.**

(b) **Cost of placing an order Rs. 100.**

(c) **Annual carrying cost per unit Rs. 15.**

(d) **Normal usage 50 units per week.**

(e) **Minimum usage 25 units per week.**

(f) **Maximum range 75 units per week.**

(g) **Re-order period 4 to 6 weeks.**

Compute from the above :

(1) **Re-order Quantity**

(2) **Re-order Level**

(3) **Minimum Level**

(4) **Maximum Level**

(5) **Average Stock Level**

Answer 21. (b)

(1) **Re-order Quantity of units used** = $\sqrt{\dfrac{2AS}{C}}$

(*Refer to note*)

   Where A = Annual demand of input units

        S = Cost of placing an order

        C = Annual carrying cost per unit

$$= \sqrt{\frac{2 \times 2600 \times Rs.\,100}{Rs.\,15}}$$

= 186 units (approximately)

(2) **Re-order Level**	=	Maximum re-order period × maximum usage
	=	6 weeks × 75 unts = 450 units
(3) **Minimum Level**	=	Re-order Level – (Normal usage × average re-order period)
	=	450 units – (50 units × 5 weeks).
	=	450 units – 250 units = 200 units
(4) **Maximum Level**	=	Re-order level + Re-order quantity – (Minimum usage × Minimum re-order period)
	=	450 unit + 186 units – 25 units × 4 weeks
	=	536 units.

(5) **Average Stock Level** = $\dfrac{1}{2}$ (Minimum Stock Level + Maximum Stock Level)

           = $\dfrac{1}{2}$ (200 units + 536 units)

           = 368 units

Note : A	=	Annual demand of input units for 12,000 units of "Y"
	=	52 weeks × Normal usage of input per week
	=	52 weeks × 50 units of input per week
	=	2,600 units.

Q. 22. (a) **Z Ltd. is committed to supply 24,000 bearings per annum to X Ltd. on a steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacturing is Rs. 324.**

   (i) What would be the optimum run size for bearing manufacture?

   (ii) Assuming that the company has policy of manufacturing 6,000 bearing per run, how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above?

   (iii) What is the minimum inventory holding cost?

Answer 22. (a)

(i) **Optimum production run (O)** $= \sqrt{\dfrac{2UP}{I}}$ where

    U = No. of units to be produced within on year.

    P = Set-up cost per production run.

    I = Carrying cost per unit per annum.

$$= \sqrt{\dfrac{2 \times 24,000 \times \text{Rs. } 324}{0.10 \times 12}}$$

$$= 3,600 \text{ bearings.}$$

(ii) **Total Cost (of maintaining the inventories) when production run sizes (Q) are 3,600 and 6,000 bearing respectively.**

Total Cost = Total set-up cost + Total carrying cost.

(Total set up cost) Q = 3,600 = (No. of production runs ordered) × Set up cost per production run)

$$= \dfrac{24,000}{3,600} \times \text{Rs. } 324 = \text{Rs. } 2,160 \tag{1}$$

(Total set-up cost) Q=6,000 $= \dfrac{24,000}{6,000} \times \text{Rs. } 324 = \text{Rs. } 1,296$ (2)

(Total carrying cost) Q=3,600 $= \dfrac{1}{2}$ Q × 1

$$= \dfrac{1}{2} \times 3,600 \times 0.10P \times \text{Rs. } 12 = \text{Rs. } 2,160 \tag{3}$$

(Total carrying cost) Q=6,000 $= \dfrac{1}{2} \times 6,000 \times 0.10P \times \text{Rs. } 12 = \text{Rs. } 3,600$ (4)

(Total Cost) Q = 3,600 = (1) + (3) = Rs. 2,160 + Rs. 2,160 = Rs. 4,320   (5)

(Total Cost) Q = 6,000 = (2) + (4) = Rs. 1,296 + Rs. 3,600 = Rs. 4,896   (6)

Extra Cost incurred = (6) – (6)   = Rs. 4,896 – Rs. 4,320 = Rs. 576

(iii) **Minimum inventory holding cost** $= \dfrac{1}{2}$ Q × I

(When Q = 3,600 bearing)

$$= \dfrac{1}{2} \times 3,600 \times 0.10 \, P \times \text{Rs. } 12$$

$$= \text{Rs. } 2,160.$$

Q. 22. (b) When and why would you recommend the LIFO method of pricing material issues?

Answer 22. (b)

LIFO method has an edge over FIFO or any other method of pricing material issues due to the following advantages:

  (i) The cost of the materials issued will be either nearer or will reflect the current market price. Thus, the cost of goods produced will be related to the trend of the market price of materials. Such a trend in price of materials enables the matching of cost of production with current sales revenues.

 (ii) The use of the method during the period of rising prices does not reflect undue high profit in the income statement, as it was under the first-in-first out or average method. In fact, the profit shown here is relatively lower because the cost of production takes into account the rising trend of material prices.

(iii) In the case of falling prices, profit tends to rise due to lower material cost, yet the finished products appear to be more competitive and are at market price.

(iv) During the period of inflation, LIFO will tend to show the correct profit and thus, avoid paying undue taxes to some extent.

Q. 23. (a) Discuss the three methods of calculating labour turnover.

Answer 23. (a)

Methods of Calculating labour turnover

  (i) Replacement method $= \dfrac{\text{No. of employees replaced} \times 100}{\text{Av. number of employee on roll}}$

 (ii) Separation method $= \dfrac{\text{No. of employees separated during the year} \times 100}{\text{Av. number of employees on roll}}$

(iii) Flex method $= \dfrac{(\text{No. of employees separated} + \text{No. of employees replaced}}{\text{Av. number of employees on roll during the period}} \times 100$

Q. 23. (b) Discuss two types of Costs, which are associated with labour turnover.

Answer 23. (b)

Two types of costs associated with labour turnover are :

  (i) **Preventive costs :**

   These costs are incurred to keep the labour turnover rate at a low level. They include costs of accommodation, transport facilities, medical services, welfare schemes, pension schemes, environment improvement, lighting, heating, air-conditioning etc. The rate of labour turnover is usually low, if a company incurs higher preventive costs.

 (ii) **Replacement costs :**

   These costs arise due to high labour turnover, e.g. cost of advertising, recruitment, selection, training & induction, abnormal breakage and scrap, extra wages & overheads etc., caused as a result of inefficient and inexperienced newly recruited workers.

Q. 24. (a) **Bonus paid under the Halsey Plan with Bonus at 50% for the time saved equals the bonus paid under the Rowan System. When will this statement hold good?**

Answer 24. (a)

Bonus under Halsey Plan

$$= \text{Standard wage rate } \times \frac{50}{100} \times \text{ Time saved} \qquad \text{.......... (i)}$$

Bonus under Rowan Plan

$$= \text{Standard wage rate } \times \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \qquad \text{.......... (ii)}$$

Bonus under Halsey Plan will be equal to the

Bonus under Rowan Plan when the following condition holds good

$$\text{Standard wage rate } \times \frac{50}{100} \times \text{ Time saved}$$

$$= \text{Standard wage rate } \times \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken}$$

$$\text{or } \frac{1}{2} = \frac{\text{Time taken}}{\text{Time allowed}}$$

$$\text{or Time taken } = \frac{1}{2} \text{ of Time allowed}$$

Hence, when the time taken is 50% of the time allowed the bonus under Halsey and Rowan Plans is equal.

Q. 24. (b) **The time allowed for a job is 8 hours. The hourly rate is Rs. 8. Prepare a statement showing :**

 (i) The bonus earned

 (ii) The total earnings of labour and

 (iii) Hourly earnings.

Under the Halsey System with 50% bonus for time saved and Rowan System for each hour saved progressively.

Answer 24. (b)

Statement of Bonus, Total earnings of Labour and hourly earnings under Halsey and Rowan Systems.

Time allowed	Time taken	Time saved	Basic Wages $B \times Rs.\ 8$	Bonus under Halsey system $C \times \dfrac{50}{100}\ Rs.\ 8$	Bonus under Rowan System $\dfrac{C}{A} \times B\ Rs.\ 8$	Total earnings under Halsey System D+E	Total earnings under Rowan System D+F	Hourly earnings under Halsey System G/B	Hourly earnings under Rowan System H/B
A hours	B hours	C = (A-B) hours	D Rs.	E Rs.	F Rs.	G Rs.	H Rs.	I Rs.	J Rs.
8	8	–	64	–	–	64	64	8.00	8.00
8	7	1	56	4	7	60	63	8.57	900
8	6	2	48	8	12	56	60	9.33	10.00
8	5	3	40	12	15	52	55	10.40	11.00
8	4	4	32	16	16	48	48	12.00	12.00
8	3	5	24	20	15	44	39	14.67	1300
8	2	6	16	24	12	40	28	20.00	14.00
8	1	7	8	28	7	36	15	36.00	15.00

Q. 25. (a) **How do you deal with the following in cost accounts?**

   (i) Employee welfare costs

  (ii) Bad debts

  (iii) Research and development costs

  (iv) Depreciation

  (v) Fringe benefits

Answer 25. (a)

  (i) **Employee welfare costs :** It includes those expenses, which are incurred by the employers on the welfare activities of their employees. The welfare activities on which these expenses are usually incurred may include canteen, hospital, play grounds, etc. These expenses should be separately recorded as Welfare Department Costs. These Costs may be apportioned to production cost centres on the basis of total wages or the number of men employed by them.

  (ii) **Bad debts :** There is no unanimity among various authors about the treatment of bad debts. Some authors believe that bad debts are financial losses and therefore should not be included in the cost of a particular product or job. Another view is that, bad debts are a part of selling and distribution overhead, especially where they arise in the normal course of trading. Therefore they should be treated in cost accounts in the same way as any other selling and distribution expense.

  (iii) **Research and development costs** : It is the cost/expense incurred for searching new or improved products, production methods/techniques or plants/equipments. Re- search cost may be incurred-for carrying basic or applied research. Both basic and applied research relates to original investigations to gain from new scientific or technical knowledge and understanding, which is not directed towards any specific practical aim (under basic research) and is directed towards a specific practical aim or objective (under applied research).

Treatment in Cost Accounts: Cost of Basic Research (if it is a continuous activity) be charged to the revenues of the concern. It may be spread over a number of years if research is not a continuous activity and amount is large.

Cost of applied research, if relates-to all existing products and methods of production then it should be treated as a manufacturing overhead of the period during which it has been incurred and absorbed. Such costs are directly charged to the product, it is solely incurred for it.

If applied research is conducted for searching new products or methods of production etc. then the research costs treatment depends upon the outcome of such research. For example, if research findings are expected to produce future benefits or if it appears that such findings are going to result in failure then the costs incurred may be amortized by charging to the Costing Profit and Loss Account of one or more years depending upon the size of expenditure. If research proves successful, then such costs will be charged to the concerned product.

Development Costs begins with the implementation of the decision to produce a new or improved product or to employ a new or improved method. The treatment of development expenses is same as that of applied research.

(iv) **Depreciation :** It represents the fall in the asset value due to its use, wear and tear and passage of time. Depreciation is an indirect cost of production and operations. It is an important element of cost and without this true cost of production cannot be obtained. In costing; depreciation on plant and machinery is normally treated as part of the factory overheads.

(v) **Fringe benefits :** In every organization, workers are paid some benefits in addition to their normal wage or salary. These additional benefits are popularly called fringe benefits. They include :

(*a*) Housing

(*b*) Children education allowance

(*c*) Holiday pay

(*d*) Leave pay

(*e*) Leave travel concession to home town or any place in india etc.

Expenses incurred on fringe benefits in respect of factory workers should be treated as factory overheads and apportioned among the production and service departments on the basis of number of workers in each department.

Fringe benefits to office and selling and distribution staff should be treated as administration overheads and selling and distribution overheads respectively and recovered accordingly.

Q. 25. (b) A departmental store has several departments. What bases would you recommend for apportioning the following items of expense to its departments :

(1) Fire insurance of Building.

(2) Rent

(3) Delivery Expenses.

(4) Purchase Department Expenses.

(5) Credit Department Expenses.

(6) General Administration Expenses.

(7) Advertisement.

(8) Sales Assistants Salaries.

(9) Personal Department expenses.

(10) Sales Commission.

Answer 25. (b)

Items of expenses	Basis For apportioning
(1) Fire insurance of Building.	Floor Area
(2) Rent.	Floor Area
(3) Delivery Expenses.	Volume or Distance or Weight
(4) Purchase Department Expenses.	No. of Purchase order/Value of Purchases
(5) Credit Department Expenses.	Credit Sales Value
(6) General Administration Expenses.	Works cost
(7) Advertisement.	Actual sales
(8) Sales Assistants Salaries.	Actual/Time devoted
(9) Personal Department expenses.	No. of Employees
(10) Sales Commission.	Actual

Q. 26. (a) MM Ltd. have three production department P1, P2 and P3 and two Service Departments S1 and S2 the details pertaining to which are as under :-

	P1	P2	P3	S1	S2
Direct Wages (Rs.)	3,000	2,000	3,000	1,500	195
Working Hours	3,070	4,475	2,419		
Value of Machines (Rs.)	60,000	80,000	1,00,000	5,000	5,000
HP of Machines	60	30	50	10	
Light Points	10	15	20	10	5
Floor space (Sq. Ft.)	2,000	2,500	3,000	2,000	500

The following figures extracted from the Accounting records are relevant :

	Rs.
Rent and Rates	5,000
General Lighting	600
Indirect Wages	1,939
Power	1,500
Depreciation on Machines	10,000
Sundries	9,695

The expenses of the service departments are allocated us under :

	P1	P2	P3	S1	S2
D	20%	30%	40%	–	10%
S2	40%	20%	30%	10%	–

Find out the total cost of product "W" which is processed for manufacture in Departments P1, P2 and P3 for 4,5 and 3 hours respectively, given that its Direct Material cost in Rs. 50 Direct Labour cost Rs. 30.

Answer 26. (a)

Statement Showing Distribution of Overheads of MM Ltd.

Particulars	Basis	Total Rs.	Production Depts.			Service Depts.	
			P1 Rs.	P2 Rs.	P3 Rs.	S1 Rs.	S2 Rs.
Rent and Rates	Area	5,000	1,000	1,250	1,500	1,000	250
General Lighting	Light points	600	100	150	200	100	50
Indirect Wages	Direct Wages	1,939	600	400	600	300	39
Power	H. P.	1,500	600	300	500	100	–
Depreciation of Machines	Value of machines	10,000	2,400	3,200	4,000	200	200
Sundries	Direct Wages	9,695	3,000	2,000	3,000	1,500	195
		28,734	7,700	7,300	9,800	3,200	734

Redistribution of Service Departments' Expenses Over
Production Departments

Particulars	Total Rs.	Production Depts.			Service Depts.	
		P1 Rs.	P2 Rs.	P3 Rs.	S1 Rs.	S2 Rs.
Total Overheads	28,734	7,700	7,300	9,800	3,200	734
Dept. S1 Overheads apportioned in the ratio (20:30:40: – :10)	3,200	640	960	1,280	–3,200	320
Dept. S2 Overheds apportioned in the ratio (40:20:30:10 –)	1,054	421.60	210.80	316.02	105.40	–1.054
Dept. S1 Overheds apportioned in the ratio (20:30:40: – :10)	105.40	21.08	31.62	42.16	– 105.40	10.54
Dept. S2 Overheads apportioned in the ratio (40:20:30:10 –)	10.54	4.22	2.11	3.16	1.05	–10.54
Dept. S1 Overheds apportioned in the ratio (20:30:40: – :10)	1.05	0.21	0.32	0.42	–1.05	0.10
Dept. S2 Overheds apportioned in the ratio (40:20:30:10 –)	0.10	0.05	0.02	0.03	–	– 0.10
Total		8,787.16	8,504.87	11,441.79		

		P1	P2	P3		
Working hours		3,070	4,475	2,419		
Overhead rate per hour		2.86	1.90	4.73		
(*See working product 'W'*)	Rs.					
Direct Material Cost	50					
Direct Labour Cost	30					
Overhead Cost	35.13					
(*Working Note-2*)						
	115.13					

Working Note :

1. **Overhead rate per hour for production department**

$$P_1 = \frac{Rs.\,8,787.16}{3,070} = Rs.\,2.86$$

Similar overhead rate for production departments P2 and P3 are Rs. 1.90 and Rs. 4.73

2. **Overhead cost**

Rs. 2.86 × 4 + Rs. 1.90 × 5 + Rs. 4.73 × 3

= Rs. 11.44 + Rs. 9.50 + Rs. 14.19 = Rs. 35.13

Note : The service departments have only indirect costs which are to be absorbed by production departments.

Q. 26. (b) In a manufacturing unit, factory overhead was recovered at a pre- determined rate of Rs. 25 per man - day. The total factory overhead expenses incurred and the man-days actually worked were Rs. 41.50 lakhs and 1.5 lakhs man-days respectively. Out of the 40,000 units produced during a period, 30,000 were sold.

On analysing the reasons, it was found that 60% of the unabsorbed overheads were due to defective planning and the rest were attributable to increase in overhead costs.

How would unabsorbed overheads be treated in Cost Accounts?

Answer 26. (b)

Computation of Unabsorbed Overheads

Man – days worked	1,50,000
	Rs.
Overhead actually incurred	41,50,000
Less : Overhead absorbed @ Rs. 25%/- per man - day (Rs. 25 × 1,50,000)	37,50,000
Unabsorbed Overheads	4,00,000
Unabsorbed Overheads due to defective planning (*i.e* 60% of Rs. 4,00,000)	2,40,000
Balance of Unabsorbed Overheads	1,60,000

Treatment of Unabsorbed Overheads in Cost Accounts

(i) The unabsorbed overheads of Rs. 2,40,000 due to defective planning to be treated as abnormal and therefore be charged to Costing Profit and Loss Accounts.

(ii) The balance unabsorbed overheads of Rs. 1,60,000 be charged to production i.e. 40,000 units at the supplementary overhead absorption rate i.e. Rs. 4/- per unit.

(*Refer to Working Note*)	**Rs.**
Charge to Costing Profit and Loss Account as part of the cost of units sold (30,000 units @ Rs. 4/-p.u.)	12,00,000
Add : To Closing stock of finished goods (10,000 units @ Rs. 4/- p.u.)	40,000
Total	1,60,000

Working Note :

$$\text{Supplementary Overheads Absorption Rate} = \frac{Rs.\,1,60,000}{Rs.\,40,000}$$

$$= Rs.\,4/-\text{ p.u.}$$

Q. 26. (c) T20 Ltd provides you the following information for the year 2011 :

Margin of Safety Rs. 64,000, Total Cost Rs. 41,600, Margin of Safety 6,400 Units , Break- Even Sales 1,600 units. During the next year 2012, the Selling Price is expected to be reduced by 10% and Variable Costs and Fixed Costs are to be increased by 12.5% and 20% respectively.

Required :

Estimate the Profit if Sales Units are expected to increase by 20%.

Estimate the Sales in order to increase Profit by 20%.

Estimate the sales in so as to earn 20% on sales.

Estimate the Sales so as to earn a Profit of Rs. 2 Per Unit.

Estimate the BEP for the next year 2012.

Answer 26. (c)

(a)   **Rs.**

    A. Sales   86,400   (Rs. 80,000 × 120% × 90%)

    B. *Less* : Variable Cost   43,200   (Rs. 32,000 × 120% × 112.5%)

    C. Contribution (A-B)   43,200

    D. *Less* : Fixed Cost   11,520   (Rs. 9,600 × 120%)

    E. Profit (C-D)   31,680

(b) Desired Sales =(New Fixed cost +Expected Profit)/New P/V Ratio

= ((Rs. 9,600 × 120%) + (Rs. 38,400 × 120%))/50% = Rs. 1,15,200

(c) Desired Sales = (New Fixed Cost + Expected Profit)/ New P/V Ratio

Let Sales be x,   x = ((Rs. 9,600 × 120%) + 0.20 ×)/50%

or,   x = Rs. 11,520/0.03 = Rs. 38,400

(d) Desired Sales (Unit)   = (New Fixed Costs + Expected Profit)/ Contribution Per Unit

Let Sales be x,   x = ((Rs. 9,600 × 120%) + 0.02x)/(Rs. 9 − Rs. 4.5) = 4,608 Units

Desired Sales (Rs.) = 4,608 Units × Rs. 9= Rs. 41,472

(e) New BEP = New Fixed Cost/ (New P/V Ratio) = (Rs. 9,600*120%)/50% = Rs. 23,040

Working Notes :

 (i) Margin of Safety(%) = Margin of Safety (Units) × 100/Actual Sales(Units)

             = 6,400 × 100/ (6,400 + 1,600) = 80%

 (ii) Total Sales = Margin of Safety (Rs.)/Margin of Safety (%) = Rs. 64,000/80% = Rs. 80,000

(iii) Profit = Total Sales − Total Cost = Rs. 80,000 − Rs. 41600 = Rs. 38400

(iv) P/V Ratio = Profit × 100/Margin of Safety = Rs. 38,400 × 100/Rs. 64,000 = 60%

 (v) Break- Even Sales = Total Sales × (100-Margin of Safety %) = Rs. 80,000 × 20% = Rs. 16,000

(vi) Fixed Costs = BEP × P/V Ratio = Rs. 16,000 × 60% = Rs. 9,600

(vii) New P/V Ratio = (New Selling Price-New Variable Cost) × 100/Naw Selling Price

     =((Rs. 10 − 105 of Rs. 10) − (Rs. 4 + 12.5% of Rs. 4)) × 100/(Rs. 10 − 10% of Rs. 10)

     = (Rs. 9 − Rs. 4.5) × 100/Rs. 9 = 50%

Q. 27. (a) From the following information relating to QS Ltd., you are required to find out (*i*) Contribution, (*ii*) Break-even point in units, (*iii*) Margin of Safety, (*iv*) Profit.

Total Fixed Costs	Rs. 4,500
Total Variable Costs	7,500
Total Sales	15,000
Units Sold	5,000 (units)

Also calculate the volume of sales to earn profit of Rs. 6,000.

Answer 27. (a)

(*i*)   **Contribution Statement**

	Output and sales 5,000 units	
	Total	*Per unit*
Sales Rs. 15,000	15,000	3.00
Less : Variable cost	7,500	1.50
Contribution	7,500	1.50

(*ii*) Break-even point in units :

B.E.P. (in units) $= \dfrac{\text{Fixed costs}}{\text{Contribution per unit}}$

$= $ Rs. 4,500/1.50 = 3,000 units.

Break-even point of sales value $= $ 3,000 × 3 = Rs. 9,000.

(*iii*) Margin of Safety $= $ Actual Sales – Sales at Break-even Point

$= $ Rs. 15,000 – Rs. 9,000 = Rs. 6,000

As per percentage $= \dfrac{6,000}{15,000} \times 100 = 40\%$

(*iv*) Profit $= $ Sales – (Fixed cost + Variable cost)

$= $ Rs. 15,000 – (Rs. 4,500 + Rs. 7,500)

$= $ Rs. 15,000 – Rs. 12,000 = Rs. 3,000.

Or, $= $ Contribution – Fixed Costs

$= $ Rs. 7,500 – 4,500 = Rs. 3,000.

Volume of sales to earn a profit of Rs. 6,000

Volume of sales $= \dfrac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P/V Ratio}^*}$

$= \dfrac{\text{Rs. }4,500 + \text{Rs. }6,000}{50\%} = \dfrac{\text{Rs. }10,500 \times 100}{50}$

$= $ Rs. 21,000

* P/V Ratio	$= \dfrac{\text{Contribution}}{\text{Sales}} \times 100$
	$= \dfrac{\text{Rs. } 7,500}{\text{Rs. } 15,000} \times 100 = 50\%$

Q. 27. (b) **The projected output of a plant, when sold, would earn Rs. 70,000 in sales income to GM Ltd. The variable costs for this production volume would be Rs. 30,000. The fixed costs are Rs. 20,000. Determine the following :**

  (i) **The break-even point of the company;**

  (ii) **The profit or loss to the company on sales of Rs. 49,000 and Rs. 28,000;**

  (iii) **The amount of sales that will enable the company to earn a net profit of Rs. 28,000.**

Answer 27. (b)

PV Ratio	$= \dfrac{\text{Total Contribution}}{\text{Total Sales}} \times 1200$
	$= \dfrac{40,000}{70,000} \times 100 = \dfrac{40}{70}\%$

(*i*) Break-even Sales = Fixed Costs / PV Ratio

$$= 20,000 \times \frac{70}{40} = \text{Rs. } 35,000$$

(*ii*) (*a*) Profit (Loss) on sales of Rs. 49,000 :

Total Contribution $= \left(49,000 \times \dfrac{40}{70} \right)$ = Rs. 28,000

Less : Fixed Costs   Rs. 20,000

             Profit   Rs.   8,000

(*b*) Profit (Loss) on sales of Rs. 28,000 :

Total Contribution $= \left(28,000 \times \dfrac{40}{70} \right)$ = Rs. 16,000

Less : Fixed Costs   Rs. 20,000

           (Loss)   Rs. (4,000)

Q. 27. (c) **The standard hours of job X is 100 hours. The job has been completed by Amar in 65 hours, Akbar in 70 hours and in 90 hours.**

  The bonus system applicable to the job is as follows :

Percentage of time saved to time allowed	*Bonus*
Savings up to 10%	**10% of time saved**
From 11% to 20 %	**15% of time saved**
From 21% to 40%	**20% of time saved**
From 41% to 100 %	**25% of time saved**

  The rate of pay is Re. 1 per hour. Calculate the earnings of each worker and also the rate of earning per hour.

Answer 27. (c)

Statement showing total earnings and rate of earning of the three workers

	Amar	Akber	Anthony
Standard hours	100	100	100
Time taken (hours)	65	70	90
Time saved (hours)	35	30	10
Percentage of time saved to std. time	35%	30%	10%
Bonus percentage	20%	20%	10%
Bonus hours	35 × 20%=7	30 × 20% = 6	10 × 10%=1
Total earning @ Re. 1	Rs. 72	Rs. 76	Rs. 91
Payment for bonus hours	7/65 = 0.10	6/70 = 0.086	1/90 = 0.011
Wage rate per normal hours	1.000	1.000	1.000
Rate of earning per hour	Rs. 1.108	Rs. 1.086	Rs. 1.011

Q. 27. (d) Following information relates to the manufacturing of a component P-104 in a cost centre:

Cost of materials	**Rs. 4/unit**
Labour charges	**Rs. 6/hour**
Labour hr required	**0.5 hr**
Overhead (all fixed)	**Rs. 300**

Prepare cost sheets showing production cost total and per unit, when a batch consists of :

(i) 10 components; (ii) 100 components; (iii)1,000 components.

Answer 27. (d)

(i)   **COST STATEMENT FOR A BATCH OF 10 COMPONENTS**

	Total Rs.	Per Unit Rs.
Cost of Material	40	4.00
Labour (10 × 0.5 × Rs. 6)	30	3.00
Prime Cost	70	7.00
Add : Overhead (Rs. 300/10 units)	300	30.00
Cost of Production	370	37.00

(ii)   **COST STATEMENT FOR A BATCH OF 100 COMPONENTS**

	Total Rs.	Per Unit Rs.
Cost of Material	4.00	4.00
Labour (100 × 0.5 × Rs. 6)	300	3.00
Prime Cost	700	7.00
Add : Overhead (Rs. 300/10 units)	300	3.00
Cost of Production	1,000	10.00

(iii)   **COST STATEMENT FOR A BATCH OF 1000 COMPONENTS**

	Total Rs.	Per Unit Rs.
Cost of Material	4000	4.00
Labour (1,000 × 0.5 × Rs. 6)	3000	3.00
Prime Cost	7000	7.00
Add : Overhead (Rs. 300/1,000 units)	300	0.30
Cost of Production	7,300	7.30

Q. 28. (a) The following are the maintenance cost incurred in a machine shop for – six months with corresponding machine hours.

Months	Machine Hours	Maintenance Cost Rs.	Months	Machine Hour	Maintenance Cost Rs.
January	2000	300	April	2400	340
February	2200	320	May	1800	280
March	1700	270	Jun	1900	290
				12000	1,800

Analyse the maintenance cost which is semi-variable into fixed and variable element.

Answer 28. (a)

By using Range Method :

	Machine Hours	Maintenance Cost Rs.
Highest Point : April	2400	340
Lowest Point : March	1700	270
	700	70

Variable cost per hour $= \dfrac{\text{Change in cost}}{\text{Change in hours}} = \dfrac{70}{700} = \text{Rs. }0.10$

Fixed cost for 2400 hours   = Rs. 340 – (2400 × .10)

                              = 340 – 240 = 100

Q. 28. (b) A company sold in two successive period 7,000 and 9,000 units respectively and incurred a loss of Rs. 10,000 and earned a profit of Rs. 10,000 in the two periods respectively.

    Calculate :

     (i) the amount of fixed expenses,

     (ii) the number of units to break even, and

    (iii) the number of units to earn a profit of Rs. 40,000.

    The selling price of the article is Rs. 100 per unit.

Answer 28. (b)

(*i*) **Fixed expenses :**

	Sales units	Profit Rs.
I Period	7,000	− 10,000
II Period	9,000	10,000
Difference	2,000	20,000

Since 2,000 units yield a contribution of Rs. 20,000, the contribution per unit is Rs. 10. Therefore the variable cost is Rs. 90, i.e., Rs. 100 less Rs. 10.

	Rs.
Sale value of 7,000 units @ Rs. 100	7,00,000
Total variable cost @ Rs. 90	6,30,000
Total contribution	70,000
Loss during the period	10,000
Total fixed expenses	80,000

(*ii*) **Break Even Point :**

	Rs.
Fixed Expenses	80,000
Contribution per unit	10

No. of units required to meet fixed expenses 80,000 ÷ 10
  or 8,000 units.

(*iii*) **Units required for a profit of Rs. 40,000**

Total contribution required	
(Fixed Expenses plus desired profit)	1,20,000

No. of units required to produce the contribution :
    1,20,000 ÷ 10   or   12,000.

Q. 28. (c) The inventory records of Suneel Brothers, Delhi, for the year 2010 show the following figures :

	Opening Stock	*Purchases*	*Closing stock*
Material A	**1200 kg**	**11,500 kg**	**200 kg**
Material B	**200 Litres**	**11,000 Litres**	**1200 Litres**
Material C	**1000 kg**	**18000 kg**	**1200 kg**

The inventory is valued @ Re 1 per Kg or Litre.

Calculate the material turnover ratios regarding each of these materials and express in number of days the average inventory held. What inference do you draw?

(I.T.R= Inventory Turnover Ratio, M.T.R= Material Turnover Ratio).

Answer 28. (c)

Materials Consumed	Opening stock+ Purchases – Closing stock
Material A	1200+11,500-200 = 12,500 kg of Rs.12,500
Material B	200+11,000-1,200 = 10,000 Litres of Rs.10,000
Material C	1,000+1,800-1,200 = 1,600 kg of Rs. 1,600
Average Inventory	**(Opening Stock+ Closing Stock)/2**
Material A	(1200+200)/2=700 kg. of Rs.700
Material B	(200+1,200)/2=700 Litres of Rs. 700
Material C	(1,000+1,200)/2=1,100kg. of Rs. 1,100.
Material Turnover Ratio	**Value of materials consumed during a period/Value of average inventory held**
Material A	12,500/700=17.86
Material B	10,000/700=14.29
Material C	1,600/1,100=1.46

Material Turnover Ratio expressed in number of days :

= (Value of average inventory × Days of the period)/Materials consumed

= Days of the period/ Inventory Turnover

Material A = (700 × 365)/12,500 = 20 days approx.

Material B = (700 × 365)/10,000 = 26 days approx.

Material C = (1,100 × 365)/1,600 = 250 days.

The above figures clearly show that material A has the highest inventory turnover ratio , while material c has the lowest. The control has to be exercised over purchase of material C.

Since the I.T.R of A is more than B. So, A is more fast moving material than B.

Q. 29. (a) A manufacturer has shown an amount of Rs. 16,190 in his books as "Establishment" which really includes the following expenses :

From this information, prepare a statement showing in separate totals (*a*) Selling Expenses, (*b*) Distribution Expenses, (*c*) Administration Expenses, and (*d*) Expenses which you would disregard in estimating costs.

		Rs.			Rs.
1.	Agents' Commission	5,750	9.	Rent, Rates and Insurance of Office	230
2.	Warehouse Wages	1,800	10.	Lighting of Warehouse	270
3.	Warehouse Repair	510	11.	Printing Stationary	1,500
4.	Lighting of Office	70	12.	Trade Magazine	70
5.	Office Salaries	1,130	13.	Donation	150
6.	Directors' Remuneration	1,400	14.	Bank Charges	100
7.	Travelling Expenses	760	15.	Discount Allowed	1,970
8.	Rent, Rates and Insurance of Warehouses	310	16.	Bad Debt	170

Answer 29. (a)

The expenses given in the problem have been put under different categories as follows :

(a) **Selling Expenses :**

		Rs.
(i)	Agent's Commission	5,750
(ii)	Travelling Expenses	760
(iii)	Bad Debt	170
		6,680

(b) **Distribution Expenses :**

		Rs.
(i)	Warehouse Wages	1,800
(ii)	Warehouse Repairs	510
(iii)	Rent, Rates & Insurance of Warehouse	310
(iv)	Lighting of Warehouse	270
		2,890

(c) **Administration Expenses :**

		Rs.
(i)	Office Salaries	1,130
(ii)	Lighting of Office	70
(iii)	Directors Remuneration	1,400
(iv)	Rent, Rates & Insurance of office	230
(v)	Printing & Stationery	1,500
(vi)	Trade Magazine	70
(vii)	Bank Charges	100
		4,500

(d) **Expenses excluded from Cost Accounts :**

		Rs.
(i)	Donations	150
(ii)	Discount Allowed	1,970
		2,120

Total Expenses :

6,860 + 2,890 + 4,500 + 2,120 = 16,190

Notes : 1. Travelling expenses have been assumed to have been related to salesmen.

2. Discount allowed is presumed to be as cash discount which is a financial item.

Q. 29. (b) The following is the Manufacturing and Profit and Loss Account of ST Ltd. for the year ended 30th June 2010 :

		Rs.		Rs.
Opening Stock :			**Sales**	5,00,000
Materials		2,000	**Closing Stock :**	
Finished Goods		3,000	Materials	18,500
Purchase of Material		1,50,000	Finished Goods	3,000
Direct Wages		1,20,000		
Power		15,500		
Carriage on Material		2,000		
Royalty		24,000		
Cost of a Special Design		5,000		
Gross Profit c/d		2,00,000		
		5,21,500		5,21,500
Rent and Rates :			**Gross Profit b/d**	2,00,000
Office	5,000		**Interest on Loan**	4,500
Factory	7,000	12,000	**Sale of Scrap (at works cost)**	750
Telephone		3,000	**Discount received**	1,750
Advertisement		7,500		
Electricity :				
Office	3,000			
Factory	4,500	7,500		
Provision for Bad Debts		10,000		
Depreciation :				
Plant & Machinery	6,000			
Delivery Vans	2,000	8,000		
Income-tax		12,000		
Salaries		25,000		
Donations		7,000		
Establishment		10,000		
Depreciation on Furniture :				
Office	2,500			
Factory	2,000	4,500		
Rent of Warehouse		6,500		
Net Profit		94,000		
		2,07,000		2,07,000

You are required to prepare a statement showing classification of cost under different components from the above information after giving due consideration to the following facts :

    (1) 60% of telephone expenses relate to office and 40% to sales department :
    (2) 25% of salaries relate to factory, 50% to office and 25% to sales department; and
    (3) 50% of the establishment expenses relate to office and 50% to sales department.

Answer 29. (b)

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Statement of Cost of ST Ltd.
for the year ended 30 June, 2010

</div>

	Rs.	Rs.	Rs.
Add : Opening Stock of materials	2,000		
Purchase	1,50,000		
	1,52,000		
Less : Closing Stock of materials	18,500		
	1,33,500		
Add : Carriage on materials	2,000		
Value of raw materials consumed		1,35,500	
Direct wages		1,20,000	
Royalty		24,000	
Cost of special design		5,000	
Prime Cost			2,84,500
Add : Factory overheads :			
Power		15,500	
Factory rent and rates		7,000	
Electricity		4,500	
Depreciation on plant and machinery		6,000	
Salaries		6,250	
Description on factory furniture		2,000	41,250
			3,25,750
Less : Sale of scrap			750
Works Cost			3,25,000
Add : Office and administration overheads :			
Office rent and rates		5,000	
Telephone expenses		1,800	
Electricity		3,000	
Salaries		12,500	
Establishment		5,000	
Depreciation on office furniture		2,500	29,800
Cost of Production			3,54,800
Add : Opening stock of finished goods			3,000
			3,57,800
Less : Closing stock of finished goods			3,000
Cost of Goods Sold			3,54,800
Add : Selling & distribution overheads :			
Telephone expenses		1,200	
Advertisement		7,500	
Depreciation on delivery vans		2,000	
Salaries		6,250	
Establishment		5,000	
Rent of warehouse		6,500	28,450
Total Cost			3,83,250
Profit			1,16,750
Sales			5,00,000

Note : Item excluded from cost accounts are : Provision for bad debts; Income tax; Interest on Loans; Discount received; and Donations.

Q. 29. (c) Utkal Construction Ltd. took a contract in 2010 for road construction . The contract price was Rs. 10,00,000 and its estimated cost of completion would be Rs. 9,20,000. At the end of 2010, the company has received Rs. 3,60,000 representing 90% of work certified. Work not yet certified had cost Rs. 10,000.

Expenditure incurred on the contract during 2010 was as follows: Materials Rs. 50,000; Labour Rs. 3,00,000; and Plant Rs. 20,000.

Materials costing Rs. 5.000 were damaged and had to be disposed of for Rs. 1,000. Plant is considered as having depreciated by 25%. Prepare contract account for 2010 in the books of Utkal Construction Ltd. Also show all possible figures that can reasonably credited to Profit and Loss Account in respect of the contract.

Answer 29. (c)

Utkal Construction Ltd.

CONTRACT ACCOUNT FOR 2010

Particulars	Amount Rs.	Particulars	Amount Rs.
To Materials	50,000	By Materials damaged	5,000
To Labour	3,00,000	By Plant at site	15,000
To Plant	20,000	By Work -in- progress:	
To Profit	60,000	Work certified	4,00,000
		- Work uncertified	10,000
	4,30,000		4,30,000

Amount of Profit that may be taken to Profit and Loss Account

(i) The contract price is Rs. 10,00,000, the work certified is Rs. 4,00,000;

(a) 1/3 of the profit earned to date may be transferred to Profit and Loss Account 60,000 × 1/3= Rs. 20,000

(b) Alternatively, the amount calculated under (a) above may be reduced on cash basis: 20,000 × 90/100 = Rs. 18,000

(ii) The estimated profit is Rs. 80,000,

(a) Profit to be transferred to Profit and Loss Account may be calcuted on the basis of work certified: 80,000 × 4,00,000/10,00,000 = Rs. 32,000

(b) Profit calculated under (a) above may be further reduced on cash basis: 32,000 × 90/100= Rs. 28,800.

Q. 30. (a) (i) What is a cost unit?

(ii) What is meant by conversion cost?

(iii) What are preproduction costs?

(iv) Define the terms — salvage and rectification.

(v) How are idle facilities treated in Cost Accounting?

(vi) What are piece-rate?

(vii) What do you understand by the term 'pre-determined rate of recovery of overheads'?

(viii) What is blanket overhead rate?

     (ix) What is margin of safety?

     (x) What is angle of incidence?

Answer 30. (a)

(i) Cost unit may be defined as "a unit of product, service or time in relation to which costs may be ascertained or expressed."

(ii) Conversion cost is the cost incurred to convert raw materials into finished goods. It is the sum of direct wages, direct expenses and manufacturing overheads.

(iii) These costs forms the part of development cost, incurred in making a trial production run, preliminary to formal production. These costs are incurred when a new factory is in the process of establishment or a new project is undertaken or a new product line or product is taken up, but there is no established or formal production to which such costs may be charged. These costs are normally treated as deferred revenue expenditure (except the portion which has been capitalised) and charged to the costs of future production.

(iv) **Salvage :** Salvaged material refers to the material retrieved from the spoiled work. Salvage is the process by which salvaged material is retrieved. The salvaged units of material are usable in the production. The value of salvaged material may be credited to the account to which spoilage is charged.

Rectification : It means bringing back the defective units either to standard units of production or as seconds, by reworking. The work of rectification in small concern's is usually entrusted to the production shop, whereas in big concerns, a separate department carries out the task. Before the start of rectification work an estimate of the cost of rectification is prepared and compared with the excess value to be obtained after rectification. The concern only goes ahead with the task of rectification if the aforesaid comparison is found favourable.

The task of rectification is usually carried out under a 'Rectification Work Order', and all costs of re-work are collected against this work order for material, labour and overhead.

If the defective production is inherent in the process of manufacture, and arises as a normal consequence of productive activities and if it can be identified with specific jobs, the rectification cost is charged to the jobs as the cost of manufacturing good units of the product. This will have the effect of adding to the cost of the jobs. If the expenditure on rectification is considered abnormal, it is excluded from product costs and charged to Costing Profit and Loss Account.

(v) Normal idle facilities cost which arises due to unavoidable reasons, should be included in the works overhead. On the other hand, abnormal idle facilities cost which arises due to plants or machines/facilities remaining idle on account of trade depression or for want of work etc., should be written off to costing profit and loss account.

(vi) Piece-rate is that rate, which is paid to a worker for producing a single unit of output. The wages of a worker under piece rate method are calculated by multiplying the number of units of output produced by a pre-determined piece rate. For example, if the pre-determined piece rate is RS.7 per unit and a worker has produced 500 units, then the total wages to be paid will be Rs. 3500.

To be more exact, the above type of piece rate method is known as straight piece rate. It has another variation also, which is known as differential piece rate. Under differential piece rate system, different piece rates are given to workers for different levels of efficiency.

(vii) The term 'pre-determined' rate of recovery of overheads' refers to a rate of overhead absorption. It is calculated by dividing the budgeted overhead expenses for the accounting period by the budgeted base for the period. This rate of overhead absorption is determined prior to the start of the activity; that is why it is called a 'pre-determined rate'.

(viii) Blanket overhead rate is one single overhead absorption rate for the whole factory. It may be computed by using the following formulae :

$$\text{Blanket overhead rate} = \frac{\text{Overhead costs for the whole factory}}{{}^*\text{Total units of the selected base}}$$

* **The selected base can be tht total output; total labour hours; machine hours etc.**

(ix) Margin of safety is the difference between actual sales and break-even sales.

(x) Angle of incidence is formed by intersection of total sales line and cost line.

Q. 30. (b) Leo Ltd. undertakes to supply 1,000 units of a component per month for the month of January, February and March. Every month a batch order is opened against which materials and labour costs are booked at actual. Overheads are levied on the basis of labour hour. The selling price is contracted at Rs. 15 per unit.

From the following data, present the cost and profit per unit of each batch order and the overall position of the order for 3,000 units. Ignore set up costs.

Months (Numbers)	Batch Output	Material Cost Rs.	Labour cost Rs.
January	1,250	6,250	5,000
February	1,500	9,000	6,000
March	1,000	5,000	4,000

Labour is paid at the rate of Rs. 4 per hour. The other details are :

Months	Overhead (Rs.)	Total Labour Hours.
January	12,000	4,000
February	9,000	4,500
March	15,000	5,000

Answer 30. (b)

	January	February	March
Labour Hours = Labour Hour Rate =	Rs. 5,000/Rs.4=1,250 Rs. 12,000/4,000 hrs; = Rs. 3	Rs. 6,000/4=1,500 Rs. 9,000/4,500hrs; =Rs. 2	Rs. 4,000/4=1,000 Rs. 15,000/5,000hrs = Rs. 3

Leo Ltd. Statement of Cost and Profit

	January	February	March	Total
Output in units	1,250	1,500	1,000	3,750
Materials	6,250	9,000	5,000	20,250
Wages	5,000	6,000	4,000	15,000
Overhead based on labour hr. rate	3,750	3,000	3,000	9,750
Total cost	15,000	18,000	12,000	45,000
Sales @ Rs.15 per unit	18,750	22,500	15,000	56,250
Profit	3,750	4,500	3,000	11,250
Cost per unit	12.00	12.00	12.00	12.00
Profit per unit (S.P.-Cost=Rs.15-Rs.12)	3.00	3.00	3.00	3.00

Overall Profit on the order = Rs. 3 × 3,000 units = Rs. 9,000

Q. 30. (c) Calculate the machine- hour rate to recover the overhead expenses indicated below :

	Per hour	*Per annum*
Electicity power	75P	
Steam	10P	
Water	2P	
Repairs		Rs. 530
Rent		Rs. 270
Running hours		2,000
Original cost	Rs. 12,500	
Book value	Rs. 2,870	
Present replacement value	Rs. 11,500	
Depreciation (on original cost)		7.5% per annum

Answer 30. (c)

Computation of Machine Hour Rate

Fixed Charges :	Rs.
- Repairs	530
- Rent	270
- Depreciation (Rs. 12,500 × 7.5%)	937.5
Total Fixed Charges	**1737.5**
Effective hrs.	2,000
Fixed Charges per hr.	0.87
(+) Variable Charges per hr.	
- Steam	0.10
- Water	0.02
- Power	0.75
Machine Hour Rate	**1.74**

Q. 30. (d) A contract expected to be completed in year 4, exhibits the following information :

End of year	Value of work certified (Rs.)	Cost of work to date (Rs.)	Cost of work not yet certified (Rs.)	Cash received (Rs.)
1.	0	50,000	50,000	0
2.	3,00,000	2,30,000	10,000	2,75,000
3.	8,00,000	6,60,000	20,000	7,50,000

The contract price is Rs. 10,00,000 and the estimated profit is 20%. You are required to calculate, how much profit should have been credited to the Profit and Loss A/c by the end of years 1,2 and 3.

Answer 30. (d)

End of Year	Value of work certified	Cost of work certified*	Notional Profit**	Amount that should have been credited to Profit and Loss A/c by the end of the Year
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
1	0	0	0	0
2	3,00,000	2,20,000	80,000	1/3 × 80,000 × (2,75,000/3,00,0000 = 24,444
3	8,00,000	6,40,000	1,60,000	2/3 × 1,60,000 × (7,50,000/8,00,000) = 1,00,000

Working Notes :

End of Year	Completion of contract	Profit credited to P&L Account
Year 1	Less than 25%	No profit credited
Year 2	255 or more than 25% But less than 50%	Cumulative profit = 1/3 × notional profit* (cash received/Value of work certified)
Year 3	50% or more than 50% But less than 90%	Cumulative Profit = 2/3*notional profit* (cash received/Value of work certified)

 * Cost of work certified = Cost of work to date-Cost of work not yet certified

 ** Notional profit = Value of work certified - (Cost of work not yet certified)

FOUNDATON EXAMINATION
(REVISED SYLLABUS - 2008)
Paper - 3 : ECONOMICS AND BUSINESS   FUNDAMENTALS
Section - I
[Economics]

Q. 1. Economic goods are goods which —
   (a) Obey the laws of economics
   (b) Are scarce and limited in supply
   (c) Are tangible
   (d) Are intangible

Answer 1. (b)

Economic good is a good that is scarce. The desire for economic goods exceeds the amount that is freely available from nature.

Q. 2. A decrease in price could be because of a
   (a) Fall in demand or a rise in supply
   (b) Rise in demand or a rise in supply
   (c) Fall in demand or a fall in supply
   (d) Rise in demand or a fall in supply

Answer 2. (a)

Fall in demand or rise in supply decrease the price of the good, while rise in demand or fall in supply increases the price of the good.

Q. 3. Which of the following has the lowest elasticity of supply?
   (a) Luxury items.
   (b) Necessities.
   (c) Perishable goods.
   (d) Items that have the least budgetary allocation.

Answer 3. (c)

Elasticity of supply is lowest when the supply curve is perfectly inelastic. That means the change in price does not have effect on quantity supplied. Perishable goods like milk and vegetables have to be disposed off before they decompose or their quality decreaes. So even if their price changes they do not have any change in supply.

Q. 4. Internet cafes in the twin cities have faced a slump in revenues because of the charges fixed by the Association of Internet Cafes for browsing the Net at Rs.60 per hour. Before this action by the association the charges were as low as Rs.30 per hour. The demand for Net browsing is

(a) Perfectly price elastic

(b) Perfectly price inelastic

(c) Relatively price elastic

(d) Relatively price inelastic

Answer 4. (c)

If the demand is relatively price elastic, for a given change in the price, the quantity demanded will change. As the charges were increased from 30 to 60 the demand for net browsing came down and the revenues decreased very largely. If the demand is inelastic then price change would not have effected the demand for net browsing and thereby revenue.

Q. 5. The average total cost will be minimum at a point where

(a) Marginal cost and average fixed cost curves intersect

(b) Marginal cost and average variable cost curves intersect

(c) Marginal cost and average cost curves intersect

(d) Marginal cost is minimum

Answer 5. (c)

The marginal cost curve intersects both the average variable cost and average cost at their respective minimum points.

Q. 6. Which of the following are valid in a perfectly competitive market, when demand is inelastic and supply is increased by a firm?

(a) The quantity decreases.

(b) The quantity remains unchanged.

(c) The price increases.

(d) The equilibrium quantity increases slightly.

Answer 6. (d)

In perfect competition no single supplier is able to influence the price or market supply and the demand is constant. So even if the supply is increased the quantity will only increase slightly.

Q. 7. A perfectly competitive firm can increase its slaes revenue by

(a) Reducing the price

(b) Increasing the price

(c) Increasing the production

(d) Increasing the expenditure on advertising

Answer 7. (c)

An individual firm in perfect competition is a price taker. The level of market price is determined by the market supply and demand. A perfectly competitive firm has control over only on quantity. So sales revenue can be increased by increasing the production only.

Q. 8. The demand and supply functions of a good in Delhi are $Q_d = 100 - 3P$ and $Q_s = 2P - 20$. If the price is Rs. 20, there would be surplus (deficit) of

   (a) 20 units

   (b) 25 units

   (c) 30 units

   (d) 35 units

Answer 8. (a)

   When P = 20,

   Q_d = 100 – 3(20) = 40 units

   Q_s = 2(20) – 20 = 20 units

   Shortagae = 40 – 20 = 20 units.

Q.9. The supply function for a product is $Q_s = 500P - 1000$. Calculate the price elasticity of supply at a price of Rs. 10.

   (a) 4000

   (b) 1.25

   (c) 500

   (d) 1.33

Answer 9. (b)

When we need to compute price elasticity of demand at a particular point (price), we use point price elasticity of supply.

The formula for point price elasticity of supply is $e_{PS} = \dfrac{\partial Q}{\partial P} \times \dfrac{P}{Q}$

Supply function is $Q_s = 500P - 1000$

When the price is Rs. 10 the quantity supplied, $Q_s = 500 \times 10 - 1000 = 4000$.

   $e_{PS} = \dfrac{\partial Q}{\partial P} \times \dfrac{P}{Q} = 500 \times \dfrac{10}{4000} = 1.25.$

Q. 10. The Marginal Cost function for a firm is found to be MC = 100 + 0.004Q. The level of output when MC = 200 is

   (a) 10,000

   (b) 12,500

   (c) 13,500

   (d) 25,000

Answer 10. (d)

200 = 100 + 0.004Q = 25,000.

Q. 11. GDP can be defined as sum of the market value of the ....

   (a) Final manufactured goods and services

   (b) Intermediate goods

   (c) Goods and services exported

   (d) Sub-standard goods and discarded services

Answer 11. (a)

Final manufactured goods and services.

Q. 12. If Nominal GDP is 11% and Real GDP is 6%, then the difference of 5% represent

    (a) Depreciation
    (b) Rate of inflation
    (c) Rate of interest
    (d) Tax burden

Answer 12. (b)

Rate of inflation.

Q. 13. As per IMF Balance of payment manual, import and export (Merchandise) of goods should be presented on

    (a) FOB basis
    (b) CIF
    (c) FOR
    (d) Any of these

Answer 13. (a)

FOB basis.

Q. 14. Disguised unemployment is mainly due to

    (a) Under employment
    (b) Seasonal nature of work
    (c) Strike and lock-out
    (d) Structural changes in the economy

Answer 14. (a)

Under employment.

Q. 15. Unemployment due to mismatch between skill possessed and present available jobs

    (a) Cyclical unemployment
    (b) Structural unemployment
    (c) Frictional unemployment
    (d) Seasonal unemployment

Answer 15. (b)

Structural unemployment

Q. 16. Which of the following is the oldest system of money?

    (a) Barter
    (b) Plastic money
    (c) Credit money
    (d) Gold

Answer 16. (a)

Barter.

Q. 17. Vijaya Ltd., is operating in a perfectly competitive industry. The Total Cost function of the firm is given by TC = 25000 + 150Q + 3Q².

If the industry is in long run equilibrium what is the price of the Vijaya Stores product?

(a) 66.77

(b) 697.7

(c) 91.3

(d) 6.9

Answer 17. (b)

In long run equilibrium price equals the minimum value of average cost. Therefore the minimum value of average cost is needed to be found.

The Average Cost (AC) is minimum when dAC/dQ = 0

TC = 25000 + 150Q + 3Q²

$$AC = \frac{TC}{Q} = \frac{25000}{Q} + 150 + 3Q$$

$$\frac{dAC}{dQ} = \frac{-25000}{Q^2} + 3 = 0$$

$$\text{Thus } Q = \left(\frac{25000}{3}\right)^{0.5} = 91.3$$

$$AC = \frac{25000}{91.3} + 150 + 3(91.3) = 697.7.$$

Thus, the long run equilibrium price = Rs. 697.7.

Q. 18. Racing Cycles Ltd. operates under conditions of perfect competition. The Total Cost (TC) function of the firm is estimated as follows :

TC = 200 + 150Q − 20Q² + Q³

Where, Q is quantity. What is the price below which the firm will be forced to shutdown its operations?

(a) Rs. 40

(b) Rs. 45

(c) Rs. 50

(d) Rs. 55

Answer 18. (c)

The firm will be forced to shutdown its operations if the price is less than the minimum average variable cost.

From the total cost function

TC = 200 + 150Q − 20Q² + Q³

Marginal cost is the first derivative of the total cost function

$$MC = \frac{d(TC)}{dQ} = 150 - 40Q + 3Q^2$$

From the total cost function, total variable cost function can be derived as

TVC = $150Q - 20Q^2 + Q^3$

Average variable cost $= \dfrac{TVC}{Q}$

$$= \frac{150Q - 20Q^2 + Q^3}{Q}$$

$$= 150 - 20Q + Q^2$$

Since the average variable cost will be minimum at its intersection with marginal cost, the minimum average variable cost is where, AVC = MC

∴ $150 - 20Q + Q^2 = 150 - 40Q + 3Q^2$

$150 - 20Q + Q^2 - 150 + 40Q - 3Q^2 = 0$

$20Q - 2Q^2 = 0$

$2Q(10 - Q) = 0$

Which has the roots Q = 0 and 10.

Disregarding the root associated with a zero output, the average variable cost is minimum at an input of 10 units.

AVC   = $150 - 20(10) + 10^2$

= 150 − 200 + 100

= Rs. 50

Thus, it is not viable for the firm to produce output at any price less than Rs. 50.

Q. 19. **Average productivity of labor for a firm is 25 when labor employed is 50 units. When labor employed is increased to 52 units, average productivity of labor declines to 24 units. At current input level the marginal productivity of labour is**

(a) − 1 unit

(b) − 2 units

(c) 1 unit

(d) 2 units

Answer 19. (a)

TP (when labor = 50 units) = 50 × 25 = 1250

TP (when labor = 52 units) = 52 × 24 = 1248

Thus, $MP = \dfrac{(1248 - 1250)}{(52 - 50)} = \dfrac{-2}{2} = -1$ unit.

Q. 20. **Assuming all other things to be constant, the damand for inferior goods increases in the following cases**

(a) When the price of the good rises

(b) When the income of people falls

(c) Depends on the supply of the goods

(d) When the income of people rises

Answer 20. (b)

Demand for interior goods increases when the income of people falls.

Q. 21. In the BoP statement, current account includes

   (i) **Merchandize, invisible items**
  (ii) **Government loans from abroad**
 (iii) **Foreign direct investment**
  (a) **(i) only**
  (b) **Both (i) and (ii) above**
  (c) **Both (i) and (iii) above**
  (d) **Both (ii) and (iii) above**

Answer 21. (a)

The current account records all transactions in merchandize and invisibles of the country with the rest of the world.

Q. 22. The following are the data pertaining to National income of an economy.

Particulars	Rs. in crores
GNP at factor prices	1,90,000
Indirect taxes	28,000
NDP at market prices	2,00,844
NNP at market prices	2,00,000
GNP at Market prices	2,14,000
Personal income taxes	20,000
Corporate Profit taxes	13,000
Retained Profits	60,000

   Calculate National income.
  (a) **1,74,000**
  (b) **1,54,000**
  (c) **1,76,000**
  (d) **1,58,000**

Answer 22. (c)

National Income   = NNP at Factor Cost

                = NNP at Market Prices – Indirect Taxes + Subsidies

Subsidies = GNP at Factor Cost + Indirect Taxes – GNP at Market Prices

        = Rs. 1,90,000 + 28,000 – 2,14,000 crore = Rs. 4,000 crore

National Income = 2,00,000 – 28,000 + 4,000 = 1,76,000 crore.

Q. 23. Which of the following statements is/are *true* about the impact of inflation in the economy?
  (a) **Higher than expected inflation hurts creditors but benefits debtors.**
  (b) **Inflation creates inefficiency in the economy because it forces people to search for prices when they could be doing something else.**

(c) **Inflation can lead to a misallocation of resources because people tend to make mistakes when there is inflation in the economy.**

(d) **All of the above.**

Answer 23. (d)

Inflation is a serious problem on the part of the government worldwide. The effect of inflation is ranging from redistribution of income and wealth of the society to the worsening the balance of payments position of the country.

(a) It is true statement that higher than expected inflation hurts creditors but benefits debtors. Debtors repay the amount, which is fixed in nominal terms. The real values of repayments in the future will decrease with an increase in inflation, leads to an increase in the wealth of the debtors. On the other hand, the wealth of the creditors will decrease with an increase in the rate of inflation.

(b) It is a true statement that inflation creates inefficiency in the economy because people spent lot of time to find a reasonable price.

(c) It is a ture statement that infalation can lead to a misallocation of resources because inflation misleads people to invest logically.

(d) Is the answer because all the above statements are correct.

Q. 24. Financial interrelation ratio is equal to

(a) **Total issues/National income**

(b) **Primary issues/Net capital formation**

(c) **Total issues/Net capital formation**

(d) **Total stock of financial assets/Stock of fiscal assets**

Answer 24. (c)

Financial Intermedian Ratio (FIR) is the ratio of financial claims issued to the net physical capital formation. FIR shows the relation between financial development and the growth of physical investment.

Q. 25. *Ceteris paribus*, an income tax

(a) **Increases the value of the expenditure and net tax revenue multiplier**

(b) **Increases the value of the expenditure multiplier and decreases the value of the net tax revenue multiplier**

(c) **Decreases the value of the expenditure and net tax revenue multiplier**

(d) **Decreases the value of the expenditure multiplier and increases the value of the net tax revenue multiplier**

Answer 25. (c)

Ceteris paribus, introduction of taxes reduces the disposable income. This in turn decreases the value of the expenditure and net tax revenue multiplier.

Q. 26. Fill in the blanks :

(i) **Internal economies accrue to a firm when it _____ .**

(ii) **Creation of saving and its productive investment in called _____ .**

(iii) **Fisher's Quantity Theory of Money is also called _____ .**

(iv) **Law of variable proportions applies in the _____ .**

(v) **Demand poll inflation is when aggregate demand _____ aggregate supply.**

(vi) Cheap money policy is followed by central bank during _____ .

(vii) Formula for calculating optimum population is _____ .

(viii) Labour cannot be separated from _____ .

(ix) _____ Propounded growth concept of economics.

(x) Price under the very long period is also called _____ .

Answer 26.

(i) Expands

(ii) Capital formation

(iii) Cash transaction theory

(iv) Short-run

(v) Exceeds

(vi) Deflation

(vii) $\dfrac{A-O}{O}$

(viii) Labourer

(ix) A. Samulson

(x) Secular price

Q. 27. Write short notes on the following :

  (i) Deficit Financing

  (ii) Functions of money

  (iii) Factors affecting supply

  (iv) Special drawing rights (SDR)

  (v) Explicit costs

Answer 27. (b)

(i) **Deficit Financing :**

When government spending exceeds its earnings, the budget is said to be deficit and to bridge the gap, if government borrows money from the Central Bank or runs down its accumulated reserves, it leads to a net addition to money supply. It is called deficit financing. It is used as an instrument to remedy depression and unemployment. Deficit financing denotes more spending by the government through created money.

Lord Keynes advocated deficit financing for lifting up of an economy from business depression and unemployment. According to him demand deficiency was the root cause of these problems. Hence the prescription to raise private expenditure comprising consumption and investment. The total expenditure of private sector cannot increase on its own in a depressionary economy. It needs external push. This is what the government should do through a policy of budgetary deficit financed by new money. Creation of new money and its injection into the economy can raise C+I+G curve upward to a level where unused and unemployed resources may be gainfully employed. Once the resources are fully employed more spending by the government will lead to inflationary rise in price.

(ii) **Functions of money :**

Money is a matter of four functions, viz.,

(*a*) ***Medium of exchange* :** Money everywhere acts as a common medium of exchange. In an exchange economy, money has an intermediary role. The origin of money lies in the inconveniences of the barter system. The invention of money has made the exchange· system smooth and convenient.

(*b*) ***Measure of value* :** Money measures exchange value of goods and services. Things are said to be cheap or expensive on the basis of amount of money for their possession. This makes exchange mutually profitable.

(*c*) ***Standard of deferred payment* :** Money as a standard of deferred payment implies the role of money in borrowing and lending. Money taken as loan is usually repaid after a time gap. This delayed payment is done through money.

(*d*) ***Store of value* :** Money gives a man command over goods and services because of its purchasing power. This purchasing power of money can be stored by keeping a part for future use. Not being perishable, value of money can be preserved for a long time.

Money plays a dynamic role in a modern economy. It lubricates the wheels of trade and commerce. Money is the lifeblood of industry. Money activates idle resources and puts them into productive channels. It helps in increasing output, employment, income and converting savings into investment.

(iii) **Factors affecting supply :**

Supply is defined as a quantity of a commodity offered by the producers to be supplied at a particular price and at a certain time.

The factors affecting the supply of a commodity are:

(*a*) The price of the commodity in the market. When price rises, there will be more profit and supply increases. The reverse will happen when price falls.

(*b*) Goals of the firm, such as profit maximization, sales maximization and employment maximization.

(*c*) The supply of a commodity is influenced by the prices of raw materials, labour and other inputs.

(*d*) State of technology used for production of a commodity. Improved and advanced technology reduces the cost of production and increases the supply.

(*e*) The government policy with reference to production of commodities, imposition of taxes, such as excise duty, sales tax, subsidy policy etc. influence the supply of a commodity.

(*f*) Expectation about future prices of the commodity.

(*g*) Prices of other commodities, e.g., the supply of one commodity falls as the prices of other goods rise.

(*h*) Number of firms in the market. Decrease in the number of firms reduces the supply.

(*i*) In case of natural disorders like flood, drought, etc. reduce the supply of a commodity specially agricultural produces.

(iv) **Special Drawing Rights (SDR) :**

About two decades ago a new international money was created by the IMF for two reasons. First to overcome the shortage of gold in the world economy leading to fall in international reserves.

Second, to avoid the movement of gold across national boundaries. This new international currency is known as Special Drawing Rights (SDR) held with the IMF. The origin of SDR thus lies in the shortage of international liquidity all over the world in the wake of acute shortage of American Dollar in the 60s and early 70s which was then the main reserve currency.

The SDR was first introduced in 1969. Under this scheme the IMF grants its member government special drawing rights from Special Drawing Account (SDA). They are like coupons which can be exchanged for currencies required by its holder for making international payments. They are also, besides gold and key currencies, a component of international reserve of an economy.

Each member of the fund was assigned an SDR quota that was granted in terms of a fixed value of gold. Hence they have been aptly described as "Paper Gold". The member countries are required to provide their currency in exchange for SDR when called upon. The use of SDR would mean a reduction in the country's foreign reserve and a corresponding increase in the SDR holding of the country receiving it.

The mechanism of the SDR system is an economy in need of foreign exchange has to apply to the Fund for the use of SDR. The Fund would designate another country having a sound foreign exchange resources to meet the need of the former. So the debtor country's SDR decreases and that of the creditor increases. The former have to pay interest at 1.5% per annum to the latter country. A designated (creditor) country can not pay more than the amount equal to twice the amount of SDRs allotted to the country. The scheme is flexible in that each country can use its quota to have an equivalent amount of convertible foreign exchange to overcome balance of payment difficulties.

(v) **Explicit costs :**

Actual payments made by a firm for purchasing or hiring resources (or factor-services) from the factor-owners or other firms are called explicit costs. In other words, explicit costs are actual money expenses directly incurred for purchasing the resources. These are the costs which a cost accountant includes under the head expenses of the firm. Hence explicit costs also. Accounting costs include all costs incurred by the firm in acquiring various inputs from outside suppliers. Thus the examples of explicit costs are: payments for raw materials and power; wages to the hired workers; rent for the factory-building; interest on borrowed money; expenses on transport and publicity, etc.

Q. 28. What is internal economies? What are its different types?

Answer 28.

Internal Economies :

Internal Economies that accrue to a particular firm with the expansion of its output and scale are termed internal economies. Internal economies of a firm are independent of the action of other firms. They are internal in the sense that they are limited to a firm when its output increase. They are not shared by other firms in the industry. Following are the main types of internal economies :

(i) **Labour Economies** — These are also known as the economies of specialization and division of labour. Division of labour and specialization are possible more in large-scale operations. Different types of workers can specialize and do the job for which they are more suited. A worker acquires greater skill by devoting his attention to a particular job. As a result of this quality and speed of work both improve. This results in a sharp increase in output per man. Thus in short, with growing scale comes, increasing specialization and increasing returns to scale.

(ii) **Technical Economies** — The main technical economies result from the indivisibilities.

Several capital goods, because of the strength and weight required, will work only if they are of a certain minimum size. There is a general principle that as the size of a capital good is increased, its total output capacity increases far more rapidly than the cost of making it. To double the size and output capacity of a blast furnace, for instance, we do not have to double the materials required. Besides this a large scale firm can easily take advantages of the use of superior technique or specialized and sophisticated machines. A large firm can also enjoy the benefits from linked processes and from the use of by-products.

(iii) **Marketing Economies** — Marketing economies arise from the large scale purchase of raw materials and other inputs. A firm may receive large discounts on the purchase of bigger volume of raw materials and intermediate goods. For instance, a large cloth mill may get more discounts on the purchase of yarn than the small mill.

Marketing economies can also be reaped by the firm in its sales promotion activities. Advertising space (in newspapers and magazines) and time (on television and radio), and the number of salesmen do not have to rise proportionately with the sales. Thus per unit selling cost may also fall with the increase in output.

(iv) **Managerial Economies** — Managerial economies arise from specialization of management and mechanisation of managerial functions. Large firms make possible the division of managerial tasks. This division of decision-making in large firms has been found very effective in the increase of the efficiency of management. Besides, large firms apply techniques of management involving a high degree of mechanization, such as telephones, telex machines, television screens and computers. These techniques save time and speed up the processing of information.

(v) **Financial Economies** — Large firms can easily raise timely and cheap finance from banks and other financial institutions and also from the general public by issue of shares and debentures.

(vi) **Risk-bearing Economies** — A large firm can more successfully withstand the risks of business. With the product diversification and by operating in several markets a large firm can withstand the risk of changing consumer's tastes and preferences.

(vii) **Economies Related to Transport and Storage Costs** — Large firms are able to enjoy freight concessions from railways and road transport. Because a large firm uses its own transport means and large vehicles, the per unit transport costs would fall. Similarly, a large firm can also have its own storge godowns and can save storage costs.

(viii) **Other Economies** — A large firm may also enjoy some other economies with the expansion of its output. Prominent among them are economies on conducting research and development activities and economies of employee welfare schemes.

As a result of all these internal economies firm's long-run average and marginal cost decline with the increase in output and scale of production.

Q. 29. What do you understand by the term 'national income'? Discuss different methods of measuring it.

Answer 29.

National Income is nothing but the income of a nation or a country. In real terms a national income is the flow of goods and services produced in an economy in aparticular period — a year. A National Sample survey has, therefore, defined national income as — money measures of the net aggregates of all commodities and services accruing to the inhabitants of a community during a specified period.

There are three alternative ways of estimating National Income of a country. Broadly it may be viewed from income side, output side and expenditure side. Let us discuss these methods :

(a) **Product method** - In simple terms this method implies that by adding the values of output produced and services rendered by different sectors one may find out the national income.

The output method is unscientific. In this method only those goods and services are counted which are paid for, that is marketed. But there are many goods and services that do not have market price and are not paid for. Services of a housewife or a teacher-father; food crop, fruits and vegetable grown in family farm would not be counted as part of the GNP. Similar services or goods would become a part of GNP if they are paid for. Thus GNP at market price invariably leads to an underestimate of gross and services.

Moreover, there lies possibility of double or even triple counting in this method. Counting wheat, flour and bread's value separately is methodologically incorrect because bread's value contains flour's value which, in turn, contains wheat's value. However, this problem can be overcome if only value of final goods are considered excluding primary and intermediate goods. The problem can be overcome in another way known as the value added method whereby only the value added by each firm in the production process is included in the output figure. Thus the value added output of all sectors makes up GNP at factor cost.

(b) **Income method** - In this method all income from employment and ownership of assets before taxation received from productive activities to be counted. It is the factor income method. The summation of incomes earned by the factors of production for their contribution to production. To these be added the undistributed profits of the private sector and trading surplus of the public sector corporations. While all those groups of income generated in production, some other are to be excluded. These are known as Transfer Earnings. Examples of such earnings are pensioner benefits, un employment doles, sickness benefits, interest on national debt etc. These are excluded, as they do not arise from productive activities.

(c) **Expenditure Method** - By measuring total domestic expenditure we can measure the income of a nation. Broadly, total domestic expenditure comprises two elements. First, consumption expenditure of the household sector on goods and services. It also includes the consumption outlays of business sector and public authorities.

Another part of national expenditure is investment expenditure by private sector and public authorities. Expenditure is said to be investment when it is used for making a fixed capital like building, machinery etc. It also means an increase in the stock of inputs and finished products.

In measuring total domestic expenditure we have to take some precautions (a) only new goods be considered. Any spending on old goods is a transfer of asset from one hand to another. There is no new asset coming through production (b) Only the final stage of purchase be included because measuring expenditure for intermediate stage may lead to duplication of spending amounts. (c) Residents of country may spend for foreign goods (import) any may also earn by selling goods abroad (exports). Hence it is necessary to exclude spending on imports and to include value of exports.

Q. 30. Distinguish between Return to a Variable Factor and Return to Scale.

Answer 30.

The main differences between returns to a variable factor and returns to scale are as indicated below :

Returns to a Variable Factor	Returns to Scale
1. Operates in the short run or it is related to short-run production-function.	1. Operated in the long-run or it is related to long-run production-function.
2. Only the quantities of a variable factor are varied.	2. All factor-inputs are varied in the same proportion.
3. There is change in the factor proportion. Suppose on 1 acre land 1 labour is employed, then the land labour ratio is 1 : 1 . Now if we add one more unit of labour on the 1 acre land, then land-labour ratio would become 1 : 2.	3. There is no change in factor-ratio. For instance, in a firm is employing 1 unit of labour and 2 units of capital, then the labour-capital ratio is 1 : 2. Now if the firm increases is scale of operation and employed 2 units of labour and 4 units of capital, the labour-capital ratio still remains the same as 1 : 2.
4. No change in the scale of production. Because here all the factor-inputs are not changed.	4. There is change in the scale of production because here all the factor-inputs are varied in the same proportion.

Section - II

[Business   Fundamentals]

Q. 31. (a) Answer the following :

    (i) Salient features of a co-operative society are :

        A. Voluntary association

        B. Service motive

        C. Equality

        D. All the above

    (ii) Advantages of limited partnership are :

        A. Enables people to invest

        B. Mobilizes large financial resources

        C. More stable

        D. All the above

    (iii) Semantic barrier to communication is referred as the :

        A. Receiver misinterpreting the symbols used by the sender

        B. Sender misusing the symbols

        C. Receiver clarifying the symbols with sender

        D. Receiver not being able to decode the symbols used by the sender

    (iv) In a stock exchange

        A. Any security can be transacted

        B. Only listed securities can be transacted

        C. Only securities of private companies be traded

        D. Any common person can conduct transaction directly.

    (v) Which of the following is not a social obligation for a firm :

        A. Avoiding anti-social practices

        B. Maintaining a healthy environment

        C. Ensuring job satisfaction of employees

        D. Earning adequate profit

Answer 31. (a)

  (i) D — All the above

 (ii) A — Enables people to invest

(iii) A — Receiver misinterpreting the symbols used by the sender

 (iv) A — Any security can be transacted

 (v) A — Avoiding anti-social practices

Q. 31. (b) Fill in the blanks :

      (i) **The minimum no. of directors in case of public company is _____ .**

      (ii) **Preliminary expenses are of a _____ nature.**

      (iii) **In case of an _____ company, the liability clause does not appear in the memorandum of association.**

      (iv) **A proxy is not allowed to vote except on a _____ , unless the articles otherwise provide.**

      (v) **The first official general meeting of shareholders is called _____ meeting.**

Answer 31. (b)

  (i) Three

 (ii) Capital

(iii) Unlimited

 (iv) Poll

  (v) Statutory

Q. 31. (c) State which of the following statements is "True" and which is "False". :

      (i) **W.T.O. is not a part of international environment.**

      (ii) **The main motive of state enterprises is to render services.**

      (iii) **For communication to be effective, it must be communicator-oriented.**

      (iv) **A limited liability partnership is registered.**

      (v) **The minimum subscription should be received within 100 days after the date of the issue of the prospectus.**

Answer 31. (c)

  (i) False

 (ii) True

(iii) False

 (iv) True

  (v) False

Q. 31. (d) Define the following terms in not more than two lines :

      (i) **Preliminary expenses**

      (ii) **Statement in lieu of prospectus**

      (iii) **Stock exchange clearing house**

      (iv) **Ex-dividend**

      (v) **Sweat equity shares**

Answer 31. (d)

  (i) Expenses incidental to the formation of a company are known as preliminary expenses. These expenses are of a capital nature, but they do not represent any tangible assets. Thus, preliminary expenses are treated as fictitious assets and these expenses are to be written off against Profit & Loss Account over a certain period.

(ii) The statement in lieu of prospectus is drafted in accordance with the form set out in Part-I of Schedule -III of the Companies Act. If a public company does not issue a prospectus, it can issue a statement in lieu of prospectus.

(iii) Important stock exchanges maintain a clearing house. It serves as a useful link between buyers and sellers of securities and pools together all the bargains of a member and ascertains his net position.

(iv) Shares are said to be bought or sold ex-dividend when the buyer acquired the shares without any right to receive the dividend declared (interest due in case of debentures and bonus). It is only the seller who gets the dividend or interest there on.

(v) Sweat equity shares means equity shares issued at a discount or for consideration other than cash for providing know-how or making available rights in the nature of intellectual property rights or value additions, by whatever name called. A company may issue sweat equity shares of a class of shares already issued.

Q. 32.　What is the difference between partnership and sole prorietorship?

Answer 32.

1. **Number of members.** Sole proprietorship is owned and controlled by one person. The number of partners in a firm can be upto ten in banking business and twenty in other cases. At least two persons are required to form a partnership.

2. **Agreement.** No agreement is required in a sole proprietorship. On the other hand, there must be an express or implied agreement among partners in order to constitute a partnership.

3. **Registration.** A sole proprietorship need not be registered except under the Shops and Establishment Act. A partnership firm should be registered otherwise it will not be able to enforce its rights in the court of law.

4. **Capital.** The entire capital of a sole proprietorship is contributed by one man, the owner of business. In a proprietorship, several persons contribute capital. Therefore, a partnership firm can raise larger financial resources than a proprietor.

5. **Management.** The management of sole proprietorship lies exclusively with its owner. He is the supreme authority in the business. But in a partnership, every partner has a right to take part in the management of the firm. There is pooling of knowledge and judgment. Work can be divided among partners according to their skills and aptitudes.

6. **Secrecy.** Secrets of sole proprietorship are known only to its owner. In partnership, secrets are shared among the partners. Therefore, a sole proprietor is in a better position to retain the secrets of business.

7. **Quick decisions.** In sole proprietorship one man takes all the decisions. But in partnership decisions are taken through mutual consultation between the partners. Therefore, sole proprietorship can take decisions more quickly than a partnership. But decsionsm taken in a partnership are likely to be less reckless and hasty than those of a proprietor.

8. **Governing law.** There is no specific law governs sole proprietorship. Partnership is governed under the Partnership Act 1932.

9. **Sharing of profits.** There is no profit sharing in a sole proprietorship and all profits belong to the owner. In a partnership profits are shared between all the partners.

10. **Flexibility of operation.** Proprietorship is a one man show whereas partnership is carried on by two or more persons. Therefore, there is greater flexibility of operations in sole proprietorship.

11. **Mutual agency.** In proprietorship there is no mutual agency. But in a partnership every partner is an implied agent of the firm and of other partners.

12. **Scale of operations.** Sole proprietorship is suitable for small scale business, while partnership is suitable for medium sized business. Scope for expansion is greater under partnership.

13. **Risk.** The owner alone bears all the risks of sole proprietorship. In a partnership risks are shared by all the partners.

14. **Continuity.** The life of a partnership is more uncertain than that of sole proprietorship. Lack of mutual trust and unity among the partners can result in untimely dissolution of partnership.

Q. 33. **What are the disadvantages of a joint stock company?**

Answer 33.

The following are the disadvantages of a joint stock company :

(i) **Adherence of too many legal formalities :** The formation of a company requires adherence of too many legal formalities. The establishment and running of a company would prove to be troublesome, because of complicated legal regulations. Moreover, the formation and management of the company is expensive too.

(ii) **Concentration of power in few hands :** Shareholders of the company have practically no say in the affairs of the company. The directors of the company become self-centered and they do not care for the shareholders. In most of the cases, directors try to formulate policies in order to promote their own interests. Thus, the company form of organization has helped concentration of economic power in few hands.

(iii) **Excessive Government control :** A company has to observe too many provisions of different laws imposed by the Government. This affects the smooth functioning of the company.

(iv) **Undue speculation in shares of the company :** Undue speculation in shares of a company is injurious to the interests of the shareholders. Sometimes, directors indulge in speculation by misusing inner information of the company for speculative purposes and personal gain.

(v) **Fraudulent management :** The promoters and directors may indulge in fraudulent practices. The unscrupulous directors may present a rosy picture of the company in its annual report. In this way, the innocent and ignorant investors are duped.

(vi) **Bureaucratic control :** Quick decisions and prompt action are absent in the management of a company. It makes a company an inflexible enterprise. As a result, officers and their assistants do not enforce any decision promptly. Opportunities may be lost because of delay in decision-making.

(vii) **High nepotism :** In companies, employees are selected not on the basis of ability but on the basis of personal interest of the management. There is scope for a high degree of favoritism and nepotism and as a result worthless people join in the company.

(viii) **Inflexibility in management :** A company cannot quickly adjust with the changing conditions in the market, because of its complex structure and legal obligations. It has, therefore, less flexibility in management.

(ix) **Monopolistic control and exploitation of consumers :** Joint stock companies facilitate formation of business combinations which ultimately lead to monopolistic control and exploitation of consumers.

(x) **Social abuses :** Evils of factory system like insanitation, pollution, congestion of cities are attributed to the company form of organization. Moreover, the close and cordial relationship between the management and employees is difficult to maintain. It brings about strikes, lock outs, retrenchment, closure, etc., in the business.

Q. 34. What are the various business objectives?

Answer 34.

The various objectives of business could be classified as follows :

1. Economic objectives
2. Social objectives
3. Human objectives
4. National objectives
5. Organic objectives

The Economic objectives are :

(a) Earning of adequate profit

(b) Production of tangible form of wealth

(c) Creation of market or creation of customers

(d) Innovation

(e) Best use of available scarce resources.

The Social objectives are :

(a) Providing quality goods and services

(b) Charging reasonable prices

(c) Generation of employment

(d) Avoiding antisocial practices and profiteering

(e) Creating and maintaining better environment.

The Human objectives are :

(a) Giving a fair deal to the employees

(b) Ensuring job satisfaction

(c) Treating employees as partners to prosperity

(d) Development of human resources

The National objectives are :

(a) Producing goods and providing services as per national priorities

(b) Development of small enterprises

(c) Guaranteeing social justice

(d) Export promotion

The Organic objectives are :

(a) Survival

(b) Growth, expansion and diversification

(c) Creating goodwill, prestige and recognition.

Q. 35.　What is Listing of securities? What are its advantages?

Answer 35.

A stock exchange does not deal in the securities of all companies. Only securities which are included in the official trade list of the stock exchange can be bought and sold on it. Therefore, listing of securities means, the inclusion of securities in the official list of a stock exchange. The securities can be listed, only if the company furnishes details of its organization and the working to stock exchange and fulfils the conditions laid down in the 'rules and regulations of the exchange' by listing the securities of a company, the stock exchange does not guarantee the financial soundness of the company or recommend it's shares to the public. It is not the function of the stock exchange to advise the investors in the selection of securities.

Advantages of Listing :

1. Listing gives the company a higher status, contributes to expansion of activities and helps its growth by making future finance easier. It enables a company to enjoy the confidence of the investing public.

2. Listing helps in widening the market for the securities issued.

3. The listed company gets some tax advantages.

4. The investors are also benefited by the listing of securities. These securities may be used for obtaining bank credit as they command higher collateral value. They stand to gain in respect of income tax. Wealth tax, estate duty and other taxes payable by them. They can be sure that there is no fraud in the issue of shares. Listing insists on due notice in advance of closure of the transfer books. Thus, it offer facilities to them for transfer, registration of right, fair and equitable allotment.

5. Listing safeguards the interest of the general public too as it enforces timely disclosure of proper information regarding dividends, bonus shares, new issues of capital etc.

FOUNDATON EXAMINATION

(REVISED SYLLABUS - 2008)

Paper - 4 : BUSINESS MATHEMATICS & STATISTICS FUNDAMENTALS

Section - I

[Arithmetic]

Q. 1. (a) If $\dfrac{a_1}{a_2} = \dfrac{a_2}{a_3} = \dfrac{a_3}{a_4} = \dfrac{a_4}{a_5}$, show that $\dfrac{a_1}{a_5} = \left(\dfrac{a_1}{a_2}\right)^4$.

(b) Three numbers are in continued proportion of which the middle one is 16 and the sum of the other two is 130. Find the numbers.

Answer 1. (a)

We have $\dfrac{a_1}{a_2} = \dfrac{a_2}{a_3} = \dfrac{a_3}{a_4} = \dfrac{a_4}{a_5} = k$ (say).

Then $a_1 = a_2 k = a_3 k.k = a_3 k^2 = a_4 k^3 = a_5 k^4$

$\quad\ a_2 = a_3 k = a_4 k^2 = a_5 k.k^2 = a_5 k^3$

$\quad\ a_3 = a_4 k = a_5 k.k = a_5 k^2$

$\quad\ a_4 = a_5 k.$

$$\therefore \frac{a_1}{a_5} = \frac{a_5 k^4}{a_5} = k^4 \ \text{ and } \ \frac{a_1}{a_2} = \frac{a_5 k^4}{a_5 k^3} = k. \ \therefore \left(\frac{a_1}{a_2}\right)^4 = k^4.$$

Hence $\dfrac{a_1}{a_5} = \left(\dfrac{a_1}{a_2}\right)^4$.

Other size. $\dfrac{a_1}{a_2} \times \dfrac{a_2}{a_3} \times \dfrac{a_3}{a_4} \times \dfrac{a_4}{a_5} = k \times k \times k \times k = k^4$, or, $\dfrac{a_1}{a_5} = k^4 = \left(\dfrac{a_1}{a_2}\right)^4 \ \left[\because \dfrac{a_1}{a_2} = k\right]$.

Answer 1. (b)

Let the first and the third number be *x* and *y* respectively. Then *x*, 16, *y* are in continued proportion.

$$\therefore \frac{x}{16} = \frac{16}{y}, \quad \text{or,} \quad xy = 256. \qquad\qquad\qquad \text{... (i)}$$

Also *x* + *y* = 130.

$\qquad \therefore \ (x - y)^2 = (x + y)^2 - 4xy = (130)^2 - 4 \times 256,$

$\qquad$ or, $(x - y)^2 = 16900 - 1024 = 15876; \ \therefore \ x - y = \pm\, 126.$ $\qquad\qquad\qquad$ ... (ii)

Solving (i) and (ii), we get *x* = 128, *y* = 2, or, *x* = 2, *y* = 128.

Hence the three numbers are 128, 16, 2 or 2, 16, 128.

Q. 2. (a) The average marks in "Elements of Mathematics" of Preliminary students of 3 centres in India is 50. The number of candidates in 3 centres are respectively 100, 120, 150. If the averages of the first two centres are 70 and 40, find the average marks of the third centre.

(b) The following are the prices of certain important commodities required by a family. The importance (weight in kgs.) attached to each commodity by the family is indicated. Compare the mean price per kg. with the weighted mean price per kg.

Commodity	Importance (wt. in kgs.)	Price per kg. Rs.
Rice	30	7.00
Wheat	12	4.00
Oils	4	40.00
Dals	4	12.00

(c) Mean monthly income of 10 workers in factory A is Rs. 4,000 and that of workers in factory B is Rs. 3,700. If the mean income of all workers in A and B is 3,800 per month, find the number of workers in B.

Answer 2. (a)

Let the average marks of the third centre be $\bar{x}_3$.

Then using the formula : $\bar{x} = \dfrac{n_1\bar{x} + n_2\bar{x}_2 + n_3\bar{x}_3}{n_1 + n_2 + n_3}$, we get

$$50 = \frac{100\times70 + 120\times40 + 150\times\bar{x}_3}{100 + 120 + 150}, \quad \text{or, } 50 = \frac{11,800 + 150\bar{x}_3}{370},$$

or,   11,800 + 150 $\bar{x}_3$ = 18,500,   or, 150 $\bar{x}_3$ = 18,500 − 11,800 = 6,700

$$\therefore \quad \bar{x}_3 = \frac{6,700}{150} = 44.67$$

Hence the required average marks of the third centre = 44.67.

Answer 2. (b)

Mean price per kg. $= \dfrac{6 + 4 + 40 + 12}{4} = \dfrac{62}{4}$ = Rs. 15.50.

Weighted Mean price per kg. $= \dfrac{\Sigma fx}{N}$, where $N = \Sigma f$.

Commodity	Importance f	Price per kg. x (Rs.)	fx
Rice	30	6	180
Wheat	12	4	48
Oils	4	40	160
Dal	4	12	48
Total	$50 = \Sigma f = N$	—	$436 = \Sigma fx$

Hence the required Mean price per kg. $= \dfrac{\Sigma fx}{N} = \dfrac{436}{50} =$ Rs. 8.72

Mean price per kg. is much higher than the weighted mean price per kg.

Answer 2. (c)

Let n_2 be the no. of workers in B. Then $\bar{x} = \dfrac{n_1 \bar{x}_1 + n_2 \bar{x}_2}{n_1 + n_2}$.

Here $n_1 = 10$, $\bar{x}_1 = 4000$, $\bar{x}_2 = 3{,}700$ and $\bar{x} = 3{,}800$, $n_2 = ?$

$$\therefore \quad 3800 = \dfrac{10 \times 4000 + n_2 \times 3700}{10 + n_2}, \quad \text{or,} \quad 38000 + 3800 n_2 = 40000 + 3700 n_2,$$

or $100 n_2 = 2000$, or, $n_2 = 20$.

Hence the required no. of workers in B = 20.

Q. 3. (a) A vessel contains a mixture of Wine and Water. Had there been a litre more of Wine and a litre less of Water, the ratio of Wine to Water would have been 7 : 8; but had there been a litre more of Water and a litre less of Wine, the ratio would have been 2 : 3. How many litres does the mixture consist of?

(b) A dealer mixes two varieties of teas costing Rs. 100 per kg. and Rs. 160 per kg. in the proportion 5 : 1. He sold the 6 kg. mixture at the rate of Rs. 120 per kg. Find his profit.

Answer 3. (a)

Let the vessel contain x litres of milk and y litres of water. Then the vessel contains $(x + y)$ litres of mixture.

By the given conditions,

$$\dfrac{x+1}{y-1} = \dfrac{7}{8} \tag{i}$$

and $$\dfrac{x-1}{y+1} = \dfrac{2}{3}. \tag{ii}$$

∴ From (i),

$$8x + 8 = 7y - 7,$$

or, $$8x - 7y = -15. \tag{iii}$$

From (ii),

$$3x - 3 = 2y + 2,$$

or, $$3x - 2y = 5. \tag{iv}$$

Solving (iii) and (iv), we get $x = 13$ and $y = 17$.

Hence the vessel contains $13 + 17$, i.e., 30 litres of mixture.

Answer 3. (b)

Of 6 kg. mixture tea there are 5 kg of 1st type costing Rs. 500 and 1 kg of 2nd type costing Rs. 160. Thus cost price of 6 kg of given mixture = 500 + 160 = 660. Their selling price = 6120 = 720. His profit = 720 – 660 = 60.

Q. 4. (a) At what rate per cent will Rs. 264.35 amount to Rs. 317.22 in 4 years?

    (b) A sum deposited at a bank fetches Rs. 13,440 after 5 years at the rate of 12% simple interest. Find the principal amount.

    (c) If I ask you for a loan and agree to repay you Rs. 300 after nine months from today, how much should you loan me if you are willing to make the loan at the rate of 6% p.a. ?

Answer 4. (a)

We have

$$A = \left(1 + \frac{nr}{100}\right) = P + \frac{Pnr}{100},$$

or, $317.22 = 264.35 + 264.35 \times 4 \times \dfrac{r}{100}$ [∵ P = 264.35, A = 317.22, n = 4]

or, $317.22 - 264.35 = 264.35 \times 4 \times \dfrac{r}{100}$,   or, $52.87 = 264.35 \times 4 \times \dfrac{r}{100}$,

or, $r = \dfrac{52.87 \times 100}{264.35 \times 4} = 5.$

Hence the required rate = 5%

Answer 4. (b)

Let the principal amount be Rs. 100. Then

   Simple interest on Rs. 100 for 5 years at 12% p.a. = 12 × 5 = Rs. 60.

   Amount at the end of 5 years = 100 + 60 = Rs. 160.

Amount	Principal
160	100
13,440	x

∴ $x = 100 \times \dfrac{13,440}{160} = $ Rs. 8,400

Answer 4. (c)

If Rs. 100 be the amount of loan, then interest $= 6 \times \dfrac{9}{12} = $ Rs. $\dfrac{9}{2}$ and amount with interest $= 100 + \dfrac{9}{2} = $ Rs. $\dfrac{209}{2}$.

If repayable amount be Rs. $\dfrac{209}{2}$, then amount of loan is Rs. 100.

If repayable amount be Rs. 300, then amount of loan is Rs. $100 \times \dfrac{2}{209} \times 300 = $ Rs. 287.08.

Q. 5. (a) A bill was drawn on 14 June 1989 at 8 months after date and was discounted on 24 September 1984 at 5% p.a. If the banker's gain on the basis of simple interest is Rs. 3, for what sum the bill was drawn?

    (b) The difference between the tree discount and the banker's discount on Rs. 12,750, paid 4 months before it is due, is Rs. 5. Find the rate per cent.

Answer 5. (a)

Date of drawing	14.6.84
Period	8 months
Nominal due date	14.2.85
Days of grace	3 days
Legally due date	17.2.85

∴   Unexpired period = 24.9.84 to 17.2.85 = 6 + 31 + 30 + 31 + 31 + 17 = 146 days.

Given B. G. = Rs. 3, or, B.D. − T.D. = Rs. 3   ... (i)

If P. V. = Rs. 100, then T.D. = 5 × $\dfrac{146}{365}$ = Rs. 2, B. V. = P. V. + T. D. = 100 + 2 = Rs. 102.

∴   B. D. = Interest on B. V. = $\dfrac{5}{100} \times 102 \times \dfrac{146}{365} = \dfrac{204}{100} =$ Rs. 2.04.

∴   B. G. = B. D. − T. D. = Rs. 2.04 − Rs. 2 = Rs. .04 = Rs. $\dfrac{1}{25}$.

If B. G. = Rs. $\dfrac{1}{25}$, then B. V. = Rs. 102.

∴   If B. G. = Rs. 3, then B. V. = $\dfrac{102}{1/25} \times 3$ = Rs. 7,650.

Hence the required **Bill Value** is **Rs. 7,650**.

Answer 5. (b)

B. V. (A) = 12750, B. D. = Interest on 12750 for 4 months at r%

$$= \dfrac{r}{100} \times \dfrac{4}{12} \times 12750 = \dfrac{255r}{6} ,$$

r being the rate per cent.

P. V. = $\dfrac{A}{1+ni} = \dfrac{12750}{1+r/300}$, T. D. = B. V. − P. V. = $12750 - \dfrac{12750}{1+r/300} = \dfrac{12750r}{300+r}$.

Now

B. D. − T. D. = B. G.,   or, $\dfrac{255r}{6} - \dfrac{12750r}{300+r} = 5$, or, $\dfrac{51r}{6} - \dfrac{2550r}{300+r} = 1$,

or, $51r\left(\dfrac{1}{6} - \dfrac{50}{300+r}\right) = 1$,   or, $51r \times \dfrac{r}{6(300+r)} = 1$, or, $17r^2 = 600 + 2r$,

or, $17r^2 - 2r - 600 = 0$,   or, $17r^2 - 102r + 100r - 600 = 0$

or, (r − 6) (17r + 100) = 0; ∴ r = 6   [∵ r cannot be negative]

Hence the required rate of interest = 6%.

Section - II
[Algebra]

Q. 6. Choose the correct option showing necessary reasons/calculations.

(a) If $x = 2 + \sqrt{3}$ then the value of $x^4 + \dfrac{1}{x^4}$ is

  (i) 98,   (ii) 196,   (iii) 194,   (iv) none of these.

(b) $^nC_r + {^nC_{r-1}}$ is equal to

  (i) $^{n-1}C_r$,   (ii) $^{n+1}C_r$,   (iii) $^nC_{r+1}$,   (iv) none of these.

(c) If $\dfrac{\log x}{y-z} = \dfrac{\log y}{z-x} = \dfrac{\log z}{x-y}$ then the value of xyz is

  (i) 1,   (ii) 0,   (iii) − 1,   (iv) none of these.

Answer 6. (a)

(iii)

$$\frac{1}{x} = \frac{1}{2+\sqrt{3}} = \frac{2-\sqrt{3}}{\left(2+\sqrt{3}\right)\left(2-\sqrt{3}\right)} = \frac{2-\sqrt{3}}{4-3} = 2 - \sqrt{3}$$

$$\therefore x + \frac{1}{x} = \left(2+\sqrt{3}\right) + \left(2-\sqrt{3}\right) = 4$$

$$x^2 + \frac{1}{x^2} = \left(x + \frac{1}{x}\right)^2 - 2 = 4^2 - 2 = 14$$

$$x^4 + \frac{1}{x^4} = \left(x^2 + \frac{1}{x^2}\right)^2 - 2 = 14^2 - 2 = 196 - 2 = 194.$$

Answer 6. (b)

(ii)

$$^nC_r + {^nC_{r-1}} = \frac{\lfloor n}{\lfloor r \lfloor n-r} + \frac{\lfloor n}{\lfloor r-1 \lfloor n-r+1}$$

$$= \frac{\lfloor n}{\lfloor r \lfloor n-r} + \left[\frac{n-r+1+r}{r(n-r+1)}\right]$$

$$= \frac{(n+1)\lfloor n}{\lfloor r \lfloor n-r+1} = \frac{\lfloor n+1}{\lfloor r \lfloor n-r+1} = {^{n+1}C_r}.$$

Answer 6. (c)

(iv)

$$\frac{\log x}{y-z} = \frac{\log y}{z-x} = \frac{\log z}{x-y} = K \text{ (say)}$$

Then   log x = K(y − z)

log y = K(z − x)

log z = K(x − y)

Adding log x + log y + log z = K (y − z + z − x + x − y) = K × 0 = 0

or, log xyz = log 1

or, xyz = 1.

Q. 7. (a) If ω be an imaginary cube root of unity then find the value of $(1 − ω + ω^2) (1 + ω − ω^2)$

(b) Simple interest and compound interest in 2 years for same principal are Rs. 200 and Rs. 210 at the same rate of interest per annum. Find the principal amount.

(c) The volume of a gas varies directly as the absolute temperature and inversely as pressure. When the pressure is 15 units and the temperature is 260 units the volume is 200 units. What will be the volume when the pressure is 18 units and the temperature is 195 units?

Answer 7. (a)

$1 + ω + ω^2 = 0$

$1 − ω + ω^2 = 1 + ω^2 − ω = − ω − ω = − 2ω$

$1 + ω − ω^2 = − ω^2 − ω^2 = − 2ω^2$

$\therefore (1 − ω + ω^2) (1 + ω − ω^2) = (− 2ω)(− 2ω^2) = 4ω^3 = 4 × 1 = 4$

Answer 7. (b)

Let   x = Principal amount and r % = rate of interest per annum

The simple interest = Rs. 200 = $x \times \dfrac{r}{100} \times 2 = \dfrac{rx}{50} \Rightarrow rx = 10000$

The compound interest = Rs. 210 = $x \left(1 + \dfrac{r}{100}\right)^2 − x$

$$= x \left(\dfrac{2r}{100} + \dfrac{r^2}{10000} \right) = \dfrac{rx}{50} + \dfrac{r^2 x}{10000}$$

$\Rightarrow 210 = 200 + \dfrac{r^2 x}{10000} \Rightarrow 10 = \dfrac{10000r}{10000} \Rightarrow r = 10$

So, $x = \dfrac{200 \times 50}{r} = \dfrac{10000}{10} = 1000$ Rs.

Answer 7. (c)

Volume = V, Pressure = P, Absolute Temp = T

$\therefore V \propto T \& V \propto \dfrac{1}{P} \Rightarrow V \propto \dfrac{T}{P} \Rightarrow V = K\dfrac{T}{P}$ K = constant

Then P = 15, T = 260 then V = 200

$200 = K \dfrac{260}{15} \Rightarrow K = \dfrac{150}{13}$

When P = 15, T = 260 then $V = \dfrac{150}{13} \times \dfrac{195}{18} = 125$ units

Q. 8. (a) If $p = \log_{10} 20$ and $q = \log_{10} 25$, find x and such that $2 \log_{10} (x + 1) = 2p - q$

   (b) If $x = \log_{2a} a$, $y = \log_{3a} 2a$, $z = \log_{4a} 3a$, Show that : $xyz + 1 = 2yz$.

   (c) Show that $\log_3 \sqrt{3\sqrt{3\sqrt{3.....\infty}}} = 1$.

Answer 8. (a)

$2p - q = 2 \log_{10} 20 - \log_{10} 25 = \log_{10} (20)^2 - \log_{10} 25$

$\qquad = \log_{10} 400 - \log_{10} 25 = \log_{10} \dfrac{400}{25} = \log_{10} 16$

Now, $2 \log_{10} (x + 1) = \log_{10} 16$ or, $\log_{10} (x + 1)^2 = \log_{10} 16$ or, $(x + 1)^2 = 16 = (\pm 4)^2$

   or, $x + 1 = \pm 4$

   $\therefore$ $x = 3, -5$.

Answer 8. (b)

L. H. S. $= \log_{2a} a \cdot \log_{3a} 2a \cdot \log_{4a} 3a + 1$

$\qquad = (\log_{10} a \times \log_{2a} 10) \cdot (\log_{10} 2a \times \log_{3a} 10) \cdot (\log_{10} 3a \times \log_{4a} 10) + 1$

$\qquad = \dfrac{\log_{10} a}{\log_{10} 2a} \times \dfrac{\log_{10} 2a}{\log_{10} 3a} \times \dfrac{\log_{10} 3a}{\log_{10} 4a} + 1$

$\qquad = \dfrac{\log_{10} a}{\log_{10} 4a} + 1 = \log_{4a} a + \log_{4a} 4a = \log_{4a} (a \cdot 4a) = \log_{4a} 4a^2$.

R.H.S. $= 2\log_{3a} 2a \cdot \log_{4a} 3a = \log_{4a} (2a)^2 = \log_{4a} \cdot 4a^2$

Hence the result.

Answer 8. (c)

Let, $x = \sqrt{3\sqrt{3\sqrt{3}}} \ldots$ or $x^2 = 3\sqrt{3\sqrt{3 \ldots \infty}}$

(squaring both sides)

or, $x^2 = 3x$ or, $x^2 - 3x = 0$ or, $x (x - 3) = 0$ or, $x - 3 = 0$ (as $x \neq 0$),

$\therefore$ $x = 3$

$\therefore$ given expression $= \log_3 3 = 1$.

Q. 9. (a) In how many ways can be letters of the word TABLE be arranged so that the vowels are always
     (i) together (ii) separated?

   (b) A student is to answer 8 out of 10 questions on an examination :
     (i) How many choice has he?
     (ii) How many if he must answer the first three questions?
     (iii) How many if he must answer at least four of the first five questions?

Answer 9. (a)

(i) In the word there are 2 vowels, 3 consonants all different. Taking the 2 vowels (A, E) as one letter we are to arrange 4 letters (i.e. 3 consonants + 1) which can be done in 4 ! ways.

Again 2 vowels can be arranged among themselves in 2 ! ways.

Hence, required number of ways = 4! × 2! = 48.

(ii) Without any restriction (i.e. whether the vowels, consonants are together or not) all the different 5 letters can be arranged in 5! ways. Arrangement of vowels together is 48 (shown above)

Hence, Required number of ways = 5! – 48 = 120 – 48 = 72.

Answer 9. (b)

(i) The 8 questions out of 10 questions may be answered in $^{10}C_8$

Now $^{10}C_8 = \dfrac{10!}{8!\,2!} = \dfrac{10 \times 9 \times (8)!}{8!\,2!} = 5 \times 9 = 45$ ways

(ii) The first 3 questions are to be answered. So there are remaining 5 (= 8 – 3) questions to be answered out of remaining 7 (= 10 – 3) questions which may be selected in $^{7}C_5$ ways.

Now, $^{7}C_5$ = 7.6 = 42 ways.

(iii) Here we have the following possible cases :

(a) 4 questions from first 5 questions (say, group A), then remaining 4 questions from the balance of 5 questions (say, group B).

(b) Again 5 questions from group A, and 3 questions from group B.

For (a), number of choice is $^{5}C_4 \times {}^{5}C_4$ = 5 × 5 = 25

For (b), number of ways is $^{5}C_5 \times {}^{5}C_3$ = 1 × 10 = 10.

Hence, Required no. of ways = 25 + 10 = 35.

Q. 10. (a) If x ∞ y, prove that px + qy ∞ ax + by, where p, q, a, b are fixed constants.

(b) If x + y ∞ x – y, show that ax + by ∞ px + qy, a, b, p, q being all constants.

(c) Find x, if $x^{x\sqrt{x}} = (x\sqrt{x})^x$.

Answer 10. (a)

Since x ∞ y, we have x = ky, where k is a constant.

Now $\dfrac{px+qy}{ax+by} = \dfrac{p \cdot ky+qy}{a \cdot ky+by} = \dfrac{y(pk+q)}{y(ak+b)} = \dfrac{pk+q}{ak+b} =$ constant = k' (say),

or, px + qy = k' (ax + by), where k' is a constant.

Hence px + qy ∞ ax + by.

Answer 10. (b)

If x + y ∞ x – y; ∴ x + y = m(x – y), where m is a constant,

or, x + y = mx – my,

or, y + my = mx – x,

or, $y(1+m) = (m-1)x$,

or, $y = \dfrac{m-1}{m+1}x = kx$, where k is a constant. Now see 10(a).

Answer 10. (c)

$x^{x\sqrt{x}} = (x\sqrt{x})^x$,

or, $x^{x \cdot x^{1/2}} = (x \cdot x^{\frac{1}{2}})^x$,

or, $x^{x^{3/2}} = (x^{3/2})^x$,

or, $x^{x^{3/2}} = x^{3x/2}$;

∴ $x^{3/2} = \dfrac{3x}{2}$,

or, $x^3 = \dfrac{9}{4}x^2$,

or, $x = \dfrac{9}{4}$ [∵ $x \neq 0$]

Section - III

[Mensuration]

Q. 11. (a) The area of a rectangle is 180 sq metres and its perimeter is 54 metres. Find its dimensions.

(b) A rectangular lawn is surrounded by a path 1 metre wide. The area of the lawn is 20 sq metres and the area of the path is 22 sq metres. Find the length and breadth of the lawn.

Answer 11. (a)

Let a metres be the length and b metres be the breadth of the rectangle. Then

$$ab = 180 \tag{i}$$

$$\text{and } 2(a+b) = 54, \text{ or, } a+b = 27. \tag{ii}$$

From (i), $a = \dfrac{180}{b}$.

Substituting this value in (ii), we get

$\dfrac{180}{b} + b = 27$, or, $180 + b^2 = 27b$, or, $b^2 - 27b + 180 = 0$, or, $(b-12)(b-15) = 0$;

∴ $b = 12$ or 15.

If b = 12, then $a = \dfrac{180}{b} = \dfrac{180}{12} = 15$ and in b = 15, then $a = \dfrac{180}{15} = 12$.

Hence the length is 15 metres and the breadth is 12 metres.

Answer 11. (b)

Let the length and the breadth of the lawn be x metres and y metres respectively. Then the length and breadth of the combined rectangular plot of lawn and path are respectively (x + 2) m and (y+2) m.
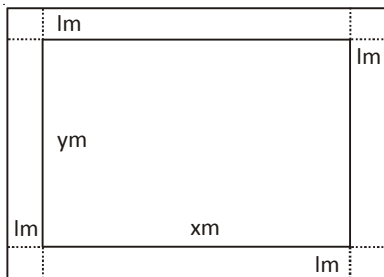
By the given conditions,

$$xy = 20 \qquad \ldots \text{(i)}$$

$$\text{or, } (x + 2)(y + 2) = 20 + 22 = 42. \qquad \ldots \text{(ii)}$$

From (ii),

$$xy + 2(x + y) + 4 = 42$$

$$\text{or, } 20 + 2(x + y) + 4 = 42,$$

$$\text{or, } 2(x + y) = 42 - 24 = 18,$$

$$\text{or, } x + y = 9. \qquad \ldots \text{(iii)}$$

From (i),

$$y = \frac{20}{x}.$$

Putting this value in (iii), we get

$$x + \frac{20}{x} = 9$$

$$\text{or, } x^2 + 20 = 9x,$$

$$\text{or, } x^2 - 9x + 20 = 0,$$

$$\text{or, } (x - 4)(x - 5) = 0.$$

$$\therefore \quad x = 4, \text{ or, } 5.$$

$$\therefore \quad y = \frac{20}{x} = 5 \text{ or } 4.$$

Hence the required length and breadth are 5 cms and 4 cms.

Q. 12. (a) Find the area of the road which is 7m. Wide and is around but outside a circular park, whose circumference is 88 metre. What would be the total cost to develop the road of at the rate of Rs. 100 per sq. metre. and to develop the park at the rate of Rs. 150 per sq. metre?

(b) A number of circular pieces of 0.25 cm. radious is to be cut from a metal sheet of dimension 11 cm by 2 cm. Find the possible number of such pieces.

Answer 12. (a)

Circumference of circular park $= 2\pi r = 2 \cdot \frac{22}{7} \cdot r = 88$ or, $r = 14$ metre. Circular Road is 7 metre wide, so outer radius (R) = 14 + 7 = 21 m.

Area of cicular road

$\therefore$ Total cost $= 770 \times 100 =$ Rs. 77,000

Again total cost of park $= \pi \times 14^2 \times 150 = \frac{22}{7} \times 14 \times 14 \times 150 =$ Rs. 92,400

Answer 12. (b)

Area of circular piece $= \pi r^2 = \frac{22}{7} \times \left(\frac{1}{4}\right)^2 = \frac{22}{7} \times \frac{1}{16}$ sq. cm.

Area of metal sheet = 11 × 2 sq. cm.

∴ Required no of pieces $= \dfrac{11 \times 2}{22\!\!\!\!\diagup_{\!7} \times 1\!\!\!\!\diagup_{\!16}} = 11 \times 2 \times \dfrac{7}{22} \times \dfrac{16}{1} = 112$.

Q. 13. (a) The area of a rectangle is 96 sq. cm and its perimeter is 40 cm, what are its length and breadth?

(b) Find the quantity of water in litre flowing out of a pipe of cross-section area 5 cm² in 1 minute if the speed of the water in the pipe is 30 cm/sec.

(c) The volumes of two spheres are in the ratio 8:27 and the difference of their radii is 3 cm. Find the radii of both the spheres.

Answer 13. (a)

Let l = length and b = breadth of rectangle in cm.

Then perimeter = 2(l + b) = 40 cm   i.e. l + b = 20   .... (1)

And area = lb = 96 sq cm.   i.e. lb = 96   .... (2)

So l(20 – l) = 96 ⟹ 20 l – l² = 96 ⟹ l² – 20 l + 96 = 0

i.e. l = 12 or 8

Then b = 20 – l = 8 or 12

But b < l so l = 12 cm and b = 8 cm.

Answer 13. (b)

Volume of water flowing in 1 sec = 5 × 30 = 150 c.c.

Volume of water flowing in 1 min = 150 × 60 = 9000 c.c. = 9 litre

Answer 13. (c)

$$\dfrac{\dfrac{4}{3}\pi r_1^3}{\dfrac{4}{3}\pi r_2^3} = \dfrac{8}{27} \Rightarrow \dfrac{r_1}{r_2} = \dfrac{2}{3} \Rightarrow r_1 = 2k,\ r_2 = 3k$$

Now 3k – 2k = 3 ⟹ k = 3

So, the radii (r_1) of 1st sphere = 6 cm and

the radii (r_2) of 2nd sphere = 9 cm.

Q. 14. (a) The circumference of the base of a cylinder is 44 cms. and its height is 20 cms. Find the volume of the cylinder.

(b) A solid cylindrical rod of length 80 cms. radius, 15 cms. is melted and made into a cube. Find the side of the cube.

Answer 14. (a)

$2\pi r = 44$ or, $2 \times \dfrac{22}{7} \times r = 44$ or, r = 7 cm.

Volume = πr²h $= \dfrac{22}{7} \times 49 \times 20 = 3080$ cu. cm.

Answer 14. (b)

Volume of cube = a³ cu. cm.   [Where a is the side of cube]

Volume of cylindrical rod $= \pi r^2 h = \dfrac{22}{7} \times 15^2 \times 80 = a^3$, by question.

Or,   a³ = 56571.428   or, $a = \sqrt[3]{56571.428}$ cm.

Q. 15. (a) The circumference of the base of a cylinder is 44 cm and its height is 20 cm. Find the volume of the cylinder.

   (b) The curved surface of a cylinder is 1000 sq cm and the diameter of the base is 20 cm. Find the volume of the cylinder and its height to the nearest millimeter.

Answer 15. (a)

If r cm be the radius of the base of the cylinder, then

$$2\pi r = 44, \text{ or, } r = \frac{44}{2\pi} = \frac{44}{2\pi} = \frac{44}{2} \times \frac{7}{22} = 7 .$$

Volume of the cylinder $= \pi r^2 \cdot h = \dfrac{22}{7} \times 7^2 \times 20 = 3080$ cu cms.

Answer 15. (b)

If r cm be the radius of the base of the cylinder, then $r = \dfrac{20}{2} = 10$; curved surface = 2πrh.

∴   2πrh = 1000, or, πh = 50, where h = height.

∴   Volume of the cylinder = πr²h = π · 10² · h = 100 × 50 = 5000 cu cm.

Height of the cylinder $= h = \dfrac{50}{\pi} = 50 \times \dfrac{7}{22} = \dfrac{175}{11} = 15.909 = 15.9$ cm.

Q. 16. (a) The diameter of the base of a conical water tank is 28 m and its height is 18 m. How much water does the tank hold?

   (b) A conical tent is required to accommodate 5 people, each person must have 16 sq ft of space on the ground and 100 cu ft of air to breathe. Give the vertical height, slant height and width of the tent.

Answer 16. (a)

Radius of the circular base of the tank $= \dfrac{28}{2} = 14$ m and its height = 18 m.

Volume of the water tank $= \dfrac{1}{3} \pi r^2 h = \dfrac{1}{3} \pi \cdot (14)^2 \cdot 18 = \dfrac{22}{7} \times 196 \times 60$

$$= 3696 \text{ cu m.} = 3696 \times 1000 \text{ decimetres}$$

$$= 3696000 \text{ litres} = 3696 \text{ kilolitres.}$$

Answer 16. (b)

Space required to accommodate 5 people = 16 × 5 = 80 sq ft; ∴ πr^2 = 80, where r is the radius of the base.

Again volume of the conical tent $= \frac{1}{3}\pi r^2 h$, where h = height of the tent

$$= \frac{1}{3} \times 80 \times h.$$

∴ $\frac{1}{3}$ × 80 × h = 100 × 5, or, $h = \frac{3 \times 500}{80} = 1875$ ft.

From πr^2 = 80, we have

$$\frac{22}{7}r^2 = 80, \text{ or, } r^2 = \frac{560}{22} = 25.45; \qquad \therefore \quad r = 5.04 \text{ ft.}$$

∴ Width = 2r = 2 × 5.04 = 10.08 ft.

l = slant height $= \sqrt{h^2 + r^2} = \sqrt{(18.75)^2 + 25.45} = \sqrt{377.01} = 19.42$ ft.

Section - IV

[Co-ordinate Geometry]

Q. 17. (a) Obtain an equation of a line through (– 5, 3) and whose intercept on the x-axis is 4 times its intercept on the y-axis.

(b) In what ratio is the joint of the points (4, – 1) and (5, 3) divided by the line x + 3y – 8 = 0?

Answer 17. (a)

Let the equation of the line in the intercept form be

$$\frac{x}{a} + \frac{y}{b} = 1. \tag{i}$$

By the given condition, a = 4b.

∴ From (i), we get

$$\frac{x}{4b} + \frac{y}{b} = 1, \text{ or, } x + 4y = 4b. \tag{ii}$$

If this line passes through the point (– 5, 3), then – 5 + 4.3 = 4b, or, b = 7⁄4.

Hence, from (ii), the required equation of the line is x + 4y = 7.

Answer 17. (b)

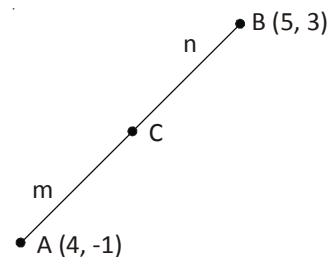Let the line x + 3y – 8 = 0 divide the join of A (4, – 1) and B (5, 3) at the point C in the ratio m : n. Then the co-ordinates of C are $C\left(\frac{5m + 4n}{m+n}, \frac{3m - n}{m+n}\right)$.

Since C lies on the line x + 3y – 8 = 0;

∴ $\frac{5m + 4n}{m+n} + 3 \cdot \frac{3m - n}{m+n} - 8 = 0$, or, $\frac{5m + 4n + 9m - 3n - 8m - 8n}{m+n} = 0$,

or, 6m – 7n = 0, or, 6m = 7n, or, $\frac{m}{n} = \frac{7}{6}$, i.e., m : n = 7 : 6.

Hence the required ratio is 7 : 6.

Q. 18. (a) Find the lengths of the intercepts of the circle $x^2 + y^2 - 8x - 7y + 12 = 0$ on the axes of co-ordinates.

(b) Show that the point (3, 7) lies inside the circle $x^2 + y^2 - 6x - 8y - 11 = 0$.

Answer 18. (a)

$x^2 + y^2 - 8x - 7y + 12 = 0$.

Putting $y = 0$,

$$x^2 - 8x + 12 = 0, \text{ or, } x^2 - 2x - 6x + 12 = 0, \text{ or, } x(x - 2) - 6 (x - 2) = 0,$$

$$\text{or, } (x - 2) (x - 6) = 0. \quad \therefore \ x = 2, 6.$$

$$\therefore \quad x_1 = 2 \text{ and } x_2 = 6.$$

Hence the intercept on the x-axis $= x_2 - x_1 = 6 - 2 = 4$.

Answer 18. (b)

Here $2g = -6$, $2f = -8$ and $c = -11$. $\quad \therefore \ g = -3$, $f = -4$.

$\therefore$ The centre C of the circle is the pont $(-g, -f) = (3, 4)$, and the radius of the circle

$$= \sqrt{g^2 + f^2 - c} = \sqrt{9 + 16 + 11} = 6.$$

The distance of the point P (3, 7) from the centre

$$C (3, 4) = \sqrt{(3-3)^2 + (7-4)^2} = 3,$$

which is less than 6.

Hence the point (3, 7) lies inside the circle.

Q. 19. (a) Find the co-ordinates of the vertex and the focus and the equation of the directrix of the parabola $3y^2 = 16x$. Find also the length of the latus rectum.

(b) Find the co-ordinates of the points at which the straight line $2x - 3y + 16 = 0$ intersects the parabola $y^2 = 16x$.

Answer 19. (a)

We have

$$3y^2 = 16x, \text{ or, } y^2 = \frac{16}{3}x$$

which is of the form $y^2 = 4ax$.

Here

$$4a = \frac{16}{3}, \text{ or, } a = \frac{4}{3}.$$

$\therefore$ The co-ordinates of the vertex are (0, 0) and the co-ordinates of the focus are (a, 0), i.e., (4/3, 0).

The equation of the directrix is

$$x + a = 0, \text{ or, } x + \frac{4}{3} = 0, \text{ or, } 3x + 4 = 0.$$

The length of the latus rectum 4a = 16/3 units.

Answer 19. (b)

We have

$$2x - 3y + 16 = 0 \tag{i}$$

$$\text{and } y^2 = 16x \tag{ii}$$

For the co-ordinates of the points of intersection of (i) and (ii), we solve these two equations for x and y.

From (i), $2x = 3y - 16$, or, $x = \dfrac{3y - 16}{2}$.

From (ii),

$$y^2 = 16 \times \dfrac{(3y - 16)}{2} = 24y - 128, \text{ or, } y^2 - 24y + 128 = 0,$$

$$\text{or, } (y - 8)(y - 16) = 0; \quad \therefore \ y = 8, 16.$$

If y = 8, $x = \dfrac{3 \times 8 - 16}{2} = 4$; if y = 16, $x = \dfrac{3 \times 16 - 16}{2} = 16$.

Hence the required co-ordinates of the points of intersection are (4, 8) and (16, 16).

Q. 20. (a) Find the co-ordinates of the foci, the eccentricity and the equations of the directrices of the hyperbola $16x^2 - 9y^2 = 144$.

(b) Show that the line $x - 3y = 13$ touches the ellipse $\dfrac{x^2}{25} + \dfrac{y^2}{16} = 1$. What are the co-ordinates of the point of contact?

Answer 20. (a)

We have

$$16x^2 - 9y^2 = 144, \text{ or, } \dfrac{16x^2}{144} - \dfrac{9y^2}{144} = 1, \text{ or, } \dfrac{x^2}{9} - \dfrac{y^2}{16} = 1.$$

Here $a^2 = 9$ and $b^2 = 16$. $\therefore$ a = 3, taking positive sign.

Now

$$e^2 = \dfrac{a^2 + b^2}{a^2} = \dfrac{9 + 16}{9} = \dfrac{25}{9}; \ \therefore \ e = \dfrac{5}{3} \ [\because e > 1.]$$

$\therefore$ The co-ordinates of the foci are

$$(\pm ae, 0) = (\pm 3 \cdot \dfrac{5}{3}, 0) = (\pm 5, 0).$$

The eccentricity is $e = \dfrac{5}{3}$.

The equations of the directrices are

$$ex \pm a = 0, \text{ or, } \dfrac{5}{3}x \pm 3 = 0 \text{ or, } 5x \pm 9 = 0.$$

Answer 20. (b)

$$x - 3y = 13 \qquad\qquad\qquad (i)$$

$$\text{and } \frac{x^2}{25} + \frac{y^2}{16} = 1.$$

From (1),

$$x = 13 + 3y.$$

∴ From (2),

$$\frac{(13+3y)^2}{25} + \frac{y^2}{16} = 1, \text{ or } \frac{169+9y^2+78y}{25} = \frac{y^2}{16} = 1, \text{ or, } \frac{2704+144y^2+1248y+25y^2}{400} = 1,$$

$$\text{or, } 169y^2 + 1248y + 2304 = 0, \quad \text{or, } (13y + 48)^2 = 0$$

which gives two real and equal values of y, i.e., $y = -\dfrac{48}{18}, \ -\dfrac{48}{18}.$

Since the roots are equal, the line (i) intersects the ellipse (ii) in two coincident points. Hence the line (i) touches the ellipse (ii).

Substituting $y = \dfrac{-48}{13}$ in x = 13 + 3y, we get

$$x = 13 + 3 \times \frac{-48}{13} = \frac{169-144}{13} = \frac{25}{13}.$$

∴ The point of contact is $\left(\dfrac{25}{13}, \ \dfrac{-48}{13}\right).$

Section - V

[Calculus]

Q. 21. (a) If $x^a y^b = (x + y)^{a+b}$ show that $\dfrac{dy}{dx} = \dfrac{y}{x}$ where a and b are independent of x and y.

   (b) If $y = Ae^{mx} + Be^{-mx}$ show that $y_2 - m^2y = 0.$

   (c) Find the area of the region lying in the first quadrant bounded by the parabola $y^2 = 4x$, the x-axis and the ordinate x = 4.

Answer 21. (a)

a log x + b log y = (a + b) log (x + y)

Differentiating w.r.t. x

$$\frac{a}{x} + \frac{b}{y} \cdot \frac{dy}{dx} = \frac{a+b}{x+y}\left(1 + \frac{dy}{dx}\right)$$

or,
$$\left(\frac{b}{y} - \frac{a+b}{x+y}\right)\frac{dy}{dx} = \frac{a+b}{x+y} - \frac{a}{x}$$

or,
$$\frac{b(x+y)-(a+b)y}{y(x+y)} \cdot \frac{dy}{dx} = \frac{x(a+b)-a(x+y)}{x(x+y)}$$

or,
$$\frac{dy}{dx} = \frac{(bx-ay)}{x(x+y)} \times \frac{y(x+y)}{(bx-ay)} = \frac{y}{x}$$

Answer 21. (b)

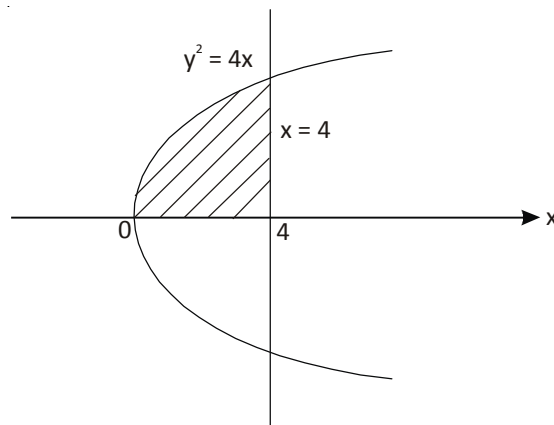$y \quad = Ae^{mx} + Be^{-mx}$

$y_1 \quad = Ame^{mx} - Bme^{-mx}$

$\quad = m(Ae^{mx} - Be^{-mx})$

$y_2 \quad = m(Ame^{mx} + Bme^{-mx})$

$\quad = m^2(Ae^{mx} + Be^{-mx}) = m^2 y$

$\therefore y_2 - m^2 y = 0$

Answer 21. (c)

$\text{Required area} = \int_0^4 y\, dx = \int_0^4 \sqrt{4x}\, dx = 2\left[\dfrac{x^{\frac{3}{2}}}{\dfrac{3}{2}}\right]_0^4$

$\quad = 2 \times \dfrac{2}{3} \times (2^2)^{\frac{3}{2}} = \dfrac{2 \times 2 \times 8}{3} = \dfrac{32}{3} \text{ sq unit}$

Q. 22. (a) If $y = \dfrac{x}{\sqrt{1-x^2}}$ show that $x\dfrac{dy}{dx} = y(y^2 + 1)$.

     (b) If $y = \left(x + \sqrt{1+x^2}\right)^m$ show that $(1+x^2)y_2 + xy_1 = m^2 y$.

     (c) Evaluate $\displaystyle\int_1^2 x \log_e x\, dx$.

Answer 22. (a)

$$\frac{dy}{dx} = \frac{1}{\sqrt{1-x^2}} + x \cdot \frac{(-2x)\left(-\frac{1}{2}\right)}{\left(1-x^2\right)^{\frac{3}{2}}} \Rightarrow x\frac{dy}{dx} = \frac{x}{\sqrt{1-x^2}} + \frac{x^3}{\left(1-x^2\right)^{\frac{3}{2}}}$$

$$\Rightarrow x\frac{dy}{dx} = \left(\frac{x}{\sqrt{1-x^2}}\right)^3 + \frac{x}{\sqrt{1-x^2}} \Rightarrow x\frac{dy}{dx} = y^3 + y = (y^2 + 1)$$

Answer 22. (b)

$$y = \left(x + \sqrt{1+x^2}\right)^m \Rightarrow y_1 m\left(x + \sqrt{1+x^2}\right)^{m-1}\left\{1 + \frac{1 \times 2x}{2\sqrt{1+x^2}}\right\}$$

$$\Rightarrow y_1 = m\left(x + \sqrt{1+x^2}\right)^{m-1}\left(\frac{x + \sqrt{1+x^2}}{\sqrt{1+x^2}}\right)$$

$$\Rightarrow y_1 = \frac{my}{\sqrt{1+x^2}} \Rightarrow y_1^2(1+x^2) = m^2 y^2$$

$$\therefore \ 2y_1 y_2(1+x^2) + 2xy_1^2 = 2m^2 yy_1$$

$$\Rightarrow y_2(1+x^2) + xy_1 = m^2 y$$

$$(1+x^2)\,y_2 + xy_1 = m^2 y \quad \text{Proved.}$$

Answer 22. (c)

$$\int_1^2 \times \log_e \times dx = \left[\frac{x^2}{2}\log_e x - \int \frac{x^2}{2}\cdot\frac{1}{x}dx\right]_1^2 = \left[\frac{x^2}{2}\log_e x\right]_1^2 - \frac{1}{2}\int_1^2 \times dx$$

$$= \frac{4}{2}\log_e 2 - 0 - \frac{1}{2}\left[\frac{x^2}{2}\right]_1^2 = 2\log_e 2 - \frac{1}{4}(4-1) = 2\log_e 2 - \frac{3}{4}$$

Q. 23. (a) If $y = \log\left(x + \sqrt{x^2 + a^2}\right)$ $y_2 + xy_1 = 0$.

(b) If $f(u, v) = u^3 - v^3 + 3u^2 v - 3vu^2$, then verify that $u\dfrac{\delta f}{\delta u} + \dfrac{\delta f}{\delta u} = 3f(u, v)$

(c) Find the area of the region bounded by curves $y^2 = x$ and $y = x$.

Answer 23. (a)

$$y = \log\left(x + \sqrt{x^2 + a^2}\right)$$

$$y_1 = \frac{1 + \frac{1}{2}(x^2 + a^2)^{-\frac{1}{2}}.2x}{x + \sqrt{x^2 + a^2}} = \frac{1 + \dfrac{x}{\sqrt{x^2 + a^2}}}{x + \sqrt{x^2 + a^2}} = \frac{1}{\sqrt{x^2 + a^2}}$$

$$y_2 = -\frac{1}{2}(x^2 + a^2)^{-\frac{3}{2}.2x} = -\frac{x}{(x^2 + a^2)\sqrt{x^2 + a^2}}$$

$$\therefore (x^2 + a^2)y_2 + xy_1 = 0$$

Answer 23. (b)

$$f(u, v) = u^3 - v^3 + 3u^2v - 3uv^2$$

$$\frac{\delta f}{\delta u} = 3u^2 + 6uv - 3v^2, \frac{\delta f}{\delta v} = -3v^2 + 3u^2 - 6uv$$

$$u\frac{\delta f}{\delta u} + v\frac{\delta f}{\delta v} = 3u^2 + 6u^2v - 3uv^2 - 3v^3 + 3u^2v - 6uv^2$$

$$= 3(u^3 - v^3 + 3u^2 v - 3uv^2) = 3 f(u, v)$$

Answer 23. (c)

$y^2 = x$ and $y = x$ cut at (0, 0) and (1, 1)

$$\text{Required area } = \int_0^1 \sqrt{x}\,dx - \int_0^1 x\,dx$$

$$\left[\frac{x^{3/2}}{3/2}\right]_0^1 - \left[\frac{x^2}{2}\right]_0^1 = \frac{2}{3}(1 - 0) - \frac{1}{2}(1 - 0) = \frac{1}{6} \text{ sq. unit}$$

Q. 24. (a) The total cost (C) for output x is as follows :

$$C = \frac{3}{5}x + \frac{15}{4}.$$

Find (i) Cost when output is 5 units (ii) Average cost of output of 10 units (iii) Marginal cost (C)

(b) The cost function (C) for commodity (q) is given by $C = q^3 - 4q^2 + 6q$. Find the AVC and also find the value of q for which AVC is minimum.

Answer 24. (a)

$$\text{For 5 units } = \frac{3}{5}.5 + \frac{15}{4} = 3 + 3.75 = 6.75 \text{ units.}$$

$$AC = \frac{C}{x} = \frac{\frac{3}{3}x + \frac{15}{4}}{x} = \frac{3}{5} + \frac{15}{4x}$$

$$\therefore \quad \text{AC for 10 units} = \frac{3}{5} + \frac{15}{40} = 0.6 + 0.375 = 0.975; \quad MC = \frac{d(C)}{dx} = \frac{3}{5} = 0.6.$$

Answer 24. (b)

$$AVC = \frac{C}{q} = q^2 - 4q + 6, \text{ (in cost function (C), fixed cost is absent)}$$

$$MC = \frac{d}{dq}(q^3 - 4q^2 + 6q) = 3q^2 - 8q + 6. \text{ For AVC minimum, slope of AC is zero i.e.,}$$

$$\frac{d}{dq}(q^2 - 4q + 6) = 0 \text{ or, } 2q - 4 = 0 \text{ or, } q = 2 \text{ units.}$$

Section - VI
[Statistics]

**Q. 25. (a) Construct a pie diagram with the following data :**

Consumers	State Electricity Board	TISCO	CESC	Railway	Coal	Others
Power Consumed : (in KWt. hours)	7,50,000	3,60,000	6,00,000	1,80,000	4,50,000	6,60,000

(b) Draw a histogram and a frequency polygon for the following data :

Weight (nearest to the pound) :	102-113	113-124	124-135	135-146	146-157	157-168	168-179	Total
No. of men :	1	1	4	14	12	5	3	40

Answer 25. (a)

Consumers	Power Consumed (in (Kwt. hrs.)	in %	degrees % × 3.6
SEB	7,50,000	25	90
TISCO	3,60,000	12	43.2
CESC	6,00,000	20	72
RAIL	1,80,000	6	21.6
COAL	4,50,000	15	54
OTHERS	6,60,000	22	79.2
	30,00,000	100	360.0
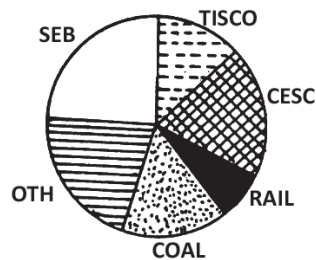
Answer 25. (b)

Wt. (lb)	102-113	113-124	124-135	135-146	146-157	157-168	168-179
No. of men (f)	1	1	4	14	12	5	3
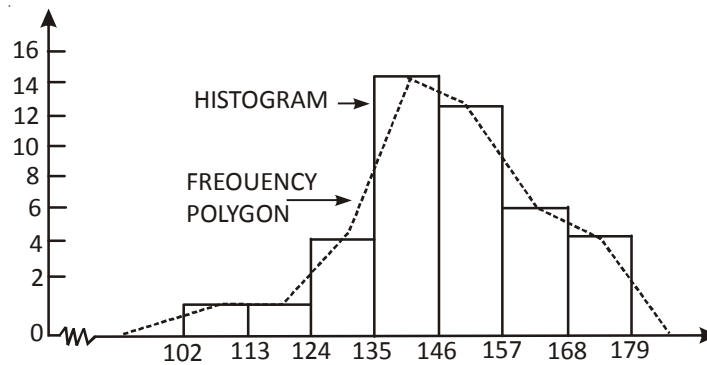
Q. 26. (a) **The mean annual salary of all employees of a company is Rs. 28,500. The mean salaries of male and female employees are Rs. 30,000 and Rs. 25,000, respectively. Find the percentage of males and females employed by the company.**

(b) **Median marks of 50 candidates in mathematics in a test are 26. Frequencies in the ranges 10 - 20 and 30 - 40 are missing the following table :**

Marks obtained :	0-10	10-20	20-30	30-40	40-50
No. of candidates :	5	—	20	—	7

Determine the missing frequencies.

Answer 26. (a)

Let n_1 be the number of males and n_2 the number of females

Then $\quad x = \dfrac{n_1 \bar{x}_1 + n_2 \bar{x}_2}{n_1 + n_2}$

$\Rightarrow 28,500 = \dfrac{n_1 \times 30,000 + n_2 \times 25,000}{n_1 + n_2}$

$\Rightarrow 3,500 n_2 = 1500 n_i$

$\Rightarrow \dfrac{n_1}{n_2} = \dfrac{70}{30} \Rightarrow n_1 : n_2 = 7 : 3$

$\therefore$ Percentage of males $= \dfrac{7}{10} \times 100 = 70$ and females = 30.

Answer 26. (b)

Let the missing frequencies be f_1 and f_2

$\therefore \quad 5 + f_1 + 20 + f_2 + 7 = 50 \Rightarrow f_1 + f_2 = 18$

Class (Marks)	No. of Candidates	Cumulative frequencies
0 - 10	5	5
10 - 20	f_1	$5 + f_1$
20 - 30	20	$25 + f_1$ * median class
30 - 40	f_2	$25 + f_1 + f_2$
40 - 50	7	$32 + f_1 + f_2$

Median $= 26 = 20 + \dfrac{25 - (5 + f_1)}{20} \times 10,$

$\Rightarrow 6 \times 20 = 200 - 10f_1 \Rightarrow f_1 = 8$

$f_1 + f_2 = 18 \Rightarrow f_2 = 18 - 8 = 10$

∴   The missing frequencies are 8 and 10.

Q. 27. (a) Find the mean deviation about arithmetic mean of the first 10 natural numbers.

   (b) From the following age distribution of 230 workers, calculate Karl Pearson's coefficient of skewness and quartile deviation :

Wages in Rs. p.m.	500 — 600	600 — 700	700 — 800	800 — 900	900 — 1000
No. of workers	30	53	82	40	25

Answer 27. (a)

Sum of first 10 natural numbers $= \dfrac{n(n+1)}{2} = \dfrac{10 \times 11}{2} = 55$

A.M. of first 10 natural numbers $= \dfrac{55}{10} = 5.5$

First 10 natural numbers (x)	$x - \bar{x}$ $= x - 5.5$	$\lvert x - 5.5 \rvert$	
1	-4.5	4.5	
2	-3.5	3.5	Mean deviation
3	-2.5	2.5	
4	-1.5	1.5	$= \dfrac{25}{10} = 2.5$
5	-0.5	0.5	
6	0.5	0.5	
7	1.5	1.5	
8	2.5	2.5	
9	3.5	3.5	
10	4.5	4.5	
		25	

Answer 27. (b)

Wages Rs. p.m.	f	Mid. value of Class (X)	x = X − 750	$\dfrac{x}{100} = x'$	fx'^2	fx'
500 — 600	30	550	− 200	− 2	120	− 60
600 — 700	53	650	− 100	− 1	53	− 53
700 — 800	82	750	0	0	0	0
800 — 900	40	850	100	1	40	40
900 — 1000	25	950	200	2	100	50
	$\Sigma f = 230$				$\Sigma fx'^2$ = 313	$\Sigma fx'$ = − 23

$$\text{Mean} = A + \left(\frac{\Sigma fx'}{\Sigma f} \right) i = 750 - \frac{23}{230} \times 100 = 740$$

$$\text{S.D.} = \left[\sqrt{ \frac{\Sigma fx'}{\Sigma f} - \left(\frac{\Sigma fx'}{\Sigma f} \right)^2 } \right] i$$

$$= 100 \sqrt{ \frac{313}{230} - \left(\frac{23}{230} \right)^2 } = 116.2$$

$$\text{Mode} = 700 + \left[\frac{82 - 53}{2 \times 82 - 53 - 40} \right] \times 100$$

$$= 700 + \frac{29}{71} \times 100 = 740.8$$

Karl Pearson's Coefficient of Skewness

$$= \frac{\text{Mean} - \text{Mode}}{\text{SD}}$$

$$= \frac{740 - 740.8}{116.2} = \frac{-0.8}{116.2} = -0.007$$

Q. 28. (a) Find the mean and standard deviation of the 2 values, (a + b) and (a − b).

(b) Calculate coefficient of variation for the following distribution of marks obtained by 60 students in a test :

Marks :	0 — 10	10 — 20	20 — 30	30 — 40	40 — 50
Students :	11	19	15	9	6

Answer 28. (a)

$$\text{Mean} = \frac{a + b + a - b}{2} = a.$$

$$\text{S.D} = \sqrt{ \frac{\Sigma (x - \bar{x})^2}{n} } = \sqrt{ \frac{(a + b - a)^2}{2} + \frac{(a - b - a)^2}{2} } = \sqrt{ \frac{b^2}{2} + \frac{b^2}{2} } = b \,.$$

Answer 28. (b)

Class Interval	Mid Value x	No. of Students f	$x - 25$ $= d$	$d' = \dfrac{d}{10}$	fd'	fd'²
0 — 10	5	11	− 20	− 2	− 22	44
10 — 20	15	19	− 10	− 1	− 19	19
20 — 30	25	15	0	0	0	0
30 — 40	35	9	10	1	9	9
40 — 50	45	6	20	2	12	24
	$\Sigma f = 60$				$\Sigma fd'$ $= -20$	fd'² $= 96$

$$\text{Mean} = A + \left(\frac{\Sigma fd'}{\Sigma f}\right) \times i = 25 - \frac{20}{60} \times 10 = 25 - \frac{20}{6} = \frac{130}{6} = 21.7 \text{ approx.}$$

$$\text{S.D.} = 10 \sqrt{\left[\frac{\Sigma fd'^2}{\Sigma f} - \left(\frac{\Sigma fd'}{\Sigma f}\right)^2 \right]}$$

$$= \sqrt{\frac{96}{60} - \left(\frac{-20}{60}\right)^2} = 10\sqrt{1.6 - 0.11} = 12.2$$

$$\text{C.V.} = \frac{\text{S.D.}}{\text{Mean}} \times 100 = \frac{12.2}{21.7} \times 100 = 56.25$$

Q. 29. (a) Explain the concept is negatively skewed.

For a frequency distribution, the quartiles are Rs. 20 and Rs. 50, and the median is 30. Calculate bowley's coefficient of skewness.

(b) Mean monthly income of 10 workers in factory A is Rs. 4,000 and that of workers in factory B is Rs. 3,700. If the mean income of all workers in A and B is Rs. 3,800 per month, find the number of workers in B.

(c) Find the missing frequecies in the following frequency distribution when it is known that the mean = 11.1, total frequency = 60.

Class limits	Frequencies	Class limites	Frequencies
9.3 — 9.7	2	11.3 — 11.7	14
9.8 — 10.2	5	11.8 — 12.2	6
10.3 — 10.7	—	12.3 — 12.7	3
10.3 — 11.2	—	12.8 — 13.2	2

Answer 29. (a)

Firs Quartile = 20 = Q_1

Second Quartile = Meadian = 30 = Q_2

Third Quartile = 50 = Q_3

Bowley's Coefficient of Skewness

$$= \frac{Q_3 + Q_1 - 2Q_2}{Q_3 - Q_1} = \frac{50 + 20 - 60}{50 - 20} = \frac{10}{30} = \frac{1}{3}.$$

Answer 29. (b)

Let the numbers of workers in factory B be x then

$$\frac{10 \times 4,000 + 3,700x}{10 + x} = 3,800$$

$\Rightarrow$ 40,000 + 3,700x = 38,000 + 3,800 x

$\Rightarrow$ 2,000 = 100x $\Rightarrow$ x = 20.

Answer 29. (c)

Class limit	Mid-value x	x − 11.5 = d	Frequency f	fd
9.3 — 9.7	9.5	− 2	2	− 4
9.8 — 10.2	10.00	− 1.5	5	− 7.5
10.3 — 10.7	10.5	− 1	f_1	$-f_1$
10.8 — 11.2	11.00	− 0.5	f_2	$-0.5\,f_2$
11.3 — 11.7	11.5	0	14	0
11.8 — 12.2	12.00	0.5	6	3
12.3 — 12.7	12.5	1	3	3
12.8 — 13.2	13.00	1.5	1	1.5
		$\Sigma d = -2$	$\Sigma f = 31 + f_1 + f_2$	$\Sigma fd = -4 - f_1 - 0.5f_2$

Mean $= 11.5 - \dfrac{4 + f_1 + 0.5\,f_2}{31 + f_1 + f_2} = 11.1$

$\Rightarrow$ $4 + f_1 + 0.5\,f_2 = 0.4 \times 60 = 24$ [$\because$ $31 + f_1 + f_2 = 60$]

$\Rightarrow$ $f_1 + 0.5\,f_2 = 20$

$\Rightarrow$ $f_1 + 0.5\,f_2 + 0.5\,f_2 - 0.5\,f_2 = 20$

$\Rightarrow$ $f_1 + f_2 - 0.5\,f_2 = 20$

$\Rightarrow$ $29 - 0.5\,f_2 = 20$ [$\because$ $31 + f_1 + f_2 = 60 \Rightarrow f_1 + f_2 = 29$]

$\Rightarrow$ $f_2 = 18, f_1 + f_2 = 29 \Rightarrow f_1 = 11$

$\therefore$ The missing frequencies are 11 and 18.

Q. 30. (a) (i) Find mean and standard deviation of following frequency distribution of ages :

Class of age (yrs) :	0 − 10	10 − 20	20 − 30	30 − 40	40 − 50	Total
No. of persons :	2	4	9	3	2	20

(ii) **Find median and mode of the following distribution :**

Weekly wages (Rs.) :	50 − 59	60 − 69	70 − 79	80 − 89	90 − 99	Total
No. of persons :	6	14	16	13	3	52

(iii) **If the fast of two samples has 100 items with mean 15 and variane 9 and the second has 150 items with mean 16 and variance 16, the the mean and variance of the combined sample.**

(b) **Short notes on :**

  (i) **Central tendency of data;**

  (ii) **Ogive less than type.**

Answer 30. (a)

(i)

Mid value (x) :	5	15	25	35	45	Total
$u = (x − 25)/10$:	− 2	− 1	0	1	2	
freq (f) :	2	4	9	3	2	20
fu :	− 4	− 4	0	3	4	− 1
fu^2 :	8	4	0	3	8	23

$$\text{mean} = 25 + 10 \times \frac{\sum fu}{\sum f} = 25 + \frac{10 \times (-1)}{20} = 25 - 0.5 = 24.5 \text{ yrs.}$$

$$\text{s.d} = \sqrt{\left[\frac{\sum fu^2}{\sum f} - \left(\frac{\sum fu}{\sum f}\right)^2\right] \times 10} = \sqrt{\left[\frac{23}{20} - \left(\frac{-1}{20}\right)^2\right] \times 10} = \sqrt{114.75} = 10.71 \text{ yrs.}$$

(ii)

Class of weekly wages (in boundaries)	49.5 − 59.5	59.5 − 69.5	69.5 − 79.5	79.5 − 89.5	89.5 − 99.5
Frequency (f)	6	14	16	13	3
Cum. freq (< type)	6	20	36	49	52

N/2 = 26, 20 < 26 < 36; Median class is 69.5 − 79.5

$$\text{Median} = 69.5 + \frac{26 - 20}{16} \times 10 = 69.5 + 3.75 = 73.25 \text{ Rs.}$$

Model class is 69.5 − 79.5 as maximum freq = 16 is in that class

$$\text{Mode } 69.5 + \frac{16 - 14}{(16 - 14) + (16 - 13)} \times 10 = 69.5 + 4 = 73.5 \text{ Rs.}$$

(iii) For the combined sample

$$\text{mean } = \frac{100 \times 15 + 150 \times 16}{100 + 150} = \frac{3900}{250} = 15.6 \text{ and}$$

$$\text{variance } = \frac{100 \times 9 + 150 \times 16 + 100 \times (15.6 - 15)^2 + 150 \times (15.6 - 16)^2}{100 + 150}$$

$$= \frac{900 + 2400 + 36 + 24}{250} = 13.44$$

Answer 30. (b)

(i) **Central tendency of data :**

The are statistcial constants which give an idea about the concentration of the values in the central part of the distribution. It can be thought of as the value of the variable which is representative of the entire distribution.

Properties : (a) It should be rigidly defined.

                (b) It should be understood and calculated easily.

                (c) It should be based on all observations.

                (d) It should be amenable to algebraic tratment.

                (e) It should be least affected by extreme values.

                (f) It should be least affected by sampling fluctuations.

A frequency distribution can be taken in the form

$x \rightarrow x_1$ x_2 ...... x_n

$f \rightarrow f_1$ f_2 ...... f_n

where $x_1, x_2, \;\; ...... \;\; x_n$ are the values of the variable x with frequencies $f_1, f_2 \;..... \; f_n$ Let $f_1 + f_2 + ... + f_n = N$. Then N is total frequency

1.   Arithmetic Mean $= \dfrac{x_1 f_1 + x_2 f_2 + ... + x_n f_n}{N}$

2.   Geometric Mean $= \left(x_1^{f_1} \cdot x_2^{f_2} ...... xn^{f_n} \right)^{1/N}$

3.   Harmonic Mean $= \dfrac{N}{f_1 \dfrac{1}{x} + f_2 \dfrac{1}{x_2} + ... + f_n \dfrac{1}{x_n}}$

4.   Median : Median is defined to be the middle most variate value when the variate values are arranged in increasing or decreasing order of magnitude.

     For continuous variable arranged in a grouped frequency distribution, median is defined as

$$\text{Median } = L_1 + \frac{\dfrac{N}{2} - F_1}{f_{me}} \times h$$

L_1 = lower class boundary of the median class

N   = total frequency

F_1 = cumulative frequency of the class preceeding the median class

f_{me} = frequency of the median class

h   = width of the median class

5. Mode : It is that value of the variate for which frequency is maximum. For grouped distribution it is given by

$$Mode = L + \frac{f_m - f_1}{2f_m - f_1 - f_2} \times h$$

L   = lower limit of modal class

f_m = frequency of modal class

f_1 = frequency of the class preceding the modal class

f_2 = frequency of the class following the modal class

(ii) Ogive less than type :

Cumulative frequency corresponding to a given variate value of a distribution is defined to be the sum total of frequencies up to and including that variate value. This is known as cumulative frequency of less than type. In case of a grouped frequency distribution, cumulative frequency (less than) of a class corresponds to the upper class-boundary of that class and it is the sum total of frequencies of classes up to and including that class.

For grouped frequency distribution of a continuous variable, cumulative, cumulative frequency distribution of less than type can be represented graphically by means of a cumulative frequency polygon also known as ogive less than type. To draw a cumulative frequency polygon, boundary values of each class are located in the X axis. The cumulative frequency table provides the cumulative frequency (less than type) corresponding to upper class boundary of a class along Y axis. For each pair of values (U_i, CF_i), a point is plotted in the graph paper. Joining all these points by straight lines, we get a cumulative frequency polygon of 'less than type'.