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# PERSONALITY

**Meaning of Personality:** Personality can be defined in many ways. It is the most attractive subject of psychology, which has inspired all the human beings, directly or indirectly, because it is connected with the flexible constitution of life. The subject of personality deals with “what we are and what we ought to be”. It studies all the ages and stages of life. The word personality has been derived from the Latin word “persona” which means a mask or a cover. It was a practice with the Roman actors to come on the stage with the mask on. They would not show their face to the audience. In this sense personality refers to the external appearance. But nowadays this meaning of personality is considered too narrow. Today the word personality is used in a wide sense. Personality is a complex term that encompasses overt as well as covert behavior. It covers each and every trait that a person possesses. Personality is what we are. It is a mirror of one’s behavior. It is sum total of traits and attributes of a person. In fact, personality includes all the dimensions of an individual: Physical, mental, Moral, Social, and Emotional in its scope.

Personality is not a concrete thing that can be easily defined. It is a comprehensive term and there are probably as many definitions of “Personality” as there are experts who study it. Some of the notable definitions are: -

**All port:** - “Personality is a dynamic organization within the individual of those psycho-physical systems that determines how well the person is adjusted to his / her environment.

**Cattle:** - “Personality is that which permits a prediction of what a person would do in a given situation.

**Woodworth:** - “Personality is the total quality of an individual’s behavior, as it is revealed in ones habits of acting and personal philosophy of life.

**According to martin, H.N:** “Personality may be defined in a broad sense as the traits that make up the person and his condition in group”.

**According to Freeman F.S:** “Personality is the integration of all characteristics (cognitive, conative, effective and physical that compose an individual and that determine his uniqueness”.

**According to Eyesenck, H.J: -** “Personality is the sum total of the actual potential behavior patterns of the organism”.

**According to G.W All port: -** “Personality is the dynamic organization, within the individual of those psychophysical systems that determines his unique adjustment to his environment”.

**Nature / Characteristics of Personality: -**

- Personality determines the adjustment of an individual to his / her environment.
- Personality is unique and specific No individual can be carbon copy of another.
- Personality is dynamic i.e. it is prone to change, it goes on changing with time and experience.
- It is the outcome of interaction between heredity and environment.
- Personality is not merely a cluster of traits, but is an organization of psychophysical system.
- Personality includes all the dimensions of an individual – physical, mental, moral, emotional & social.
- Every human being possesses Personality. It is related to one’s consciousness about himself / herself.
- Learning and experience contributes towards growth and development of Personality.

**According to Vernon:** - “Personality is an organized system of traits, sentiments, complexes and habits (together with interests and abilities) that distinguishes the individuals, as we see him from each individual”.

**According to Michel, S.T:** - “Personality usually refers to the distinctive pattern of behavior (including thoughts and emotions) that characterizes each individual’s adaptation to the situation.

**Alport’s Theory of Personality:** G.W Alport has been one of the most outstanding trait Psychologist. According to him, “Personality is the dynamic organization within the individual of those psycho- physical systems that determine his unique adjustment to the environment. Thus, Personality is dynamic and goes on changing and evolving with time and experience. It contains both psychological and physical elements. It helps man in adjusting to his environment.

He defined trait as “an actual force, motive and disposition within the individual that initiate and guide behavior. Traits are not linked with a small number of stimuli but they are general and enduring in nature. He classified human traits into three broad categories: -

❖ Cardinal Traits

Central Traits

❖ Secondary Traits

**Cardinal Traits:** - Traits which appear in most of the behavior of the organism are called “cardinal traits”. Cardinal Trait (s) is the “master trait” of an individual. Such traits if found in an individual are limited to one or two at the most as far as number is concerned. For instance if a person is devoted to achievement or has humoursness as cardinal trait. He will bring quality of humor into almost all situations irrespective of actual demand.

Such traits overrule other traits & direct the whole Personality of the individual towards them.

**Central Traits:** - These traits represent those few characteristic tendencies which can be ordinarily used to describe a person, e.g. honesty, kindness, etc. According to Allport, we need to know such traits of an individual in order to describe his personality.

**Secondary Traits:** - These traits are not as dominant as the central or cardinal traits. They appear in only a relatively small range of situations and are not considered strong enough to be regarded as integral part of one's personality. Because of their specific and narrow connotation they are called "attitudes" e.g. I like mangoes: I like carrot.

Thus the trait theory formulated by Allport emphasized that an individual differs from others but also has common trait with others.

Central to Allport's system is the concept of proprium, which includes what traditional psychology has included under the terms of self, ego and style of life. According to Allport, activities which are considered to be due to self or ego may be called propriate of the personality. Thus assertion, self extension, rational thinking, self image, self identity, concept of body, process of knowledge etc have been called "propria" by Allport. These factors are not given but growing. These are not real physical structures but concepts.

**Sheldon's Theory:** - Psychologists interested in the study of personality differentiated between type and trait approaches. Within psychology, the type approach to personality given by Sheldon is fairly well known. using body build and temperament as the main basis, Sheldon proposed the Endomorphic, Mesomorphic & Ectomorphic typology. The **Endomorphs** are fat, soft & round. By temperament they are relaxed & sociable. The personality pattern of the endomorph is labeled as 'viscerotonia'. The constellation of traits associated with viscerotonia includes love of comfort, food, affection and people. They have a tendency to relaxation, sociability and conviviality. They are home loving and placid.

**The Mesomorphs** have strong musculature, are rectangular with a strong body build. They are energetic & courageous.

The personality pattern of the mesomorph is labeled as “Somatotonic”. The personality traits associated with “Somatotonic” personality pattern are assertiveness; love of action, risk and thrills; craving for muscular activity: aggressiveness; and last for power.

The **Ectomorphs** are thin, long and fragile in body build. They are brainy, artistic and introvert. The personality pattern associated with ectomorph is called cerebrotonia. The personality pattern of cerebrotonia is characterized by a predominance of restraint, inhibition and desire for concealment and solitude especially when troubled.

### **Jung’s Typology:**

Carl Gustav Jung (pronounced as young) a psychiatrist from Switzerland was born in 1875. He was interested to become an archaeologist, but studied medicine. He was planning to specialize in surgery. But due to the influence of a text book by Krafft-Ebing (a German Neurologist) he got interested in Psychiatry. Jung developed his own school of thought known as Analytical Psychology. He maintained the structure of personality as a complex of interacting systems that strive towards eventual harmony.

C.G Jung classified human beings on the basis of his notion of attitudes and functions. In the words of Jung there are two behavioral dimensions:

(a) Extrovert and (b) Introvert. This classification of Jung is known as typology of human beings and is considered as most influential among professional workers. The major characteristics of these are as:

**(a) Extrovert:** These people tend to be interested in the external world of things and people. They are more likely to be sociable, talkative and venturesome. They are friendly and are free from worries. It has been reported that such people gain excellence in social contacts, mix with people around them. These people have been labeled to be life of every party. Social workers, business executives, politicians may be considered as extroverts.

**Introvert:** - These people are seen to be pre-occupied with the internal world of their own thoughts, feelings and experiences. They generally are inhibited ,contemplative and aloof .introverts are shy, sensitive and self centered. They usually avoid being with others and preferring not to get disturbed by others with them, thinking predominates them and they keep themselves busy in thoughts and try to impress others by their thoughts.

It has been reported that people with this type of behavior are interested in the physical environment which is comprised of trees, plants, machines etc. This table gives us clear picture between Extroverts and Introverts.

**COMPARISON**

<b><u>S. No.</u></b>	<b><u>Extroverts</u></b>	<b><u>Introverts</u></b>
01	Fluent in Speech	Better at working than at speaking
02	Free from worries	Inclined to worry
03	Not easily embarrassed	Easily Embarrassed
04	Usually conservative	Inclined to be radical
05	Interested in athletics	Food of books and magazines
06	Governed by objective data	More Influenced by subjective feelings
07	Friendly	Rather reversed
08	Like to work with others	Like to work alone
09	Neglectful of ailments and personal belongings	Careful of ailments and personal belongings
10	Flexible and Adaptable	Lacking in flexibility

**Rogers Self Theory:** - The humanistic approach is one of the most influential approaches in psychology. Carl Rogers and Abraham Maslow have particularly contributed to the development of humanistic perspective on personality. The most important idea proposed by Rogers is that of a fully functioning person. He believes that fulfillment is the motivating force for personality development. People try to express

their capabilities, potentials & talents to the fullest extent possible. There is an inborn tendency among persons that directs them to actualize their inherited nature.

Rogers makes two basic assumptions about human behavior.

1. One is that behavior is goal – directed and worth while.
2. The second is that people (who are innately good) will almost always choose adaptive self – actualizing behavior.

Roger's theory grew out his experience of listening to patients in his clinic. He noted that self was an important element in the experience of his clients. Thus, his theory is structured around the concept of self.

Roger's theory of personality has two basic concepts (a) The organism and (b) The self. The organism is considered as the centre of all experiences which usually takes place within the individual at a particular time. The totality of experience is called phenomenal field. It develops a person's unique outlook or frame of reference. The phenomenal field of the individual includes totality of experiences. The self as a part of the phenomenal field can perhaps best be thought of as the concept of 'I' me or myself. In addition to this concept of self called the real self, there is an ideal self which represents what we would like to be.

this theory assumes that people are constantly engaged in the process of actualizing there true self. Rogers suggests that each person has a concept of real self and ideal self. An ideal self is the self that a person would like to be when there is a correspondence between the real self and ideal self a person is generally happy. Discrepancy between the real self and ideal self often results in unhappiness and dissatisfaction. Roger's basic principal is that people have a tendency to maximize self – concept through self – actualization. In this process, the self grows, expands and becomes more social. Rogers view personality development as a continuous process. It involves learning to evaluate one self and mastering the process of self – actualization. In order to achieve self – actualization, four conditions are necessary;

The person must be respected and loved by others.

The person must respect and have faith in himself and his abilities to achieve his goal. The choices available to the individual must be clearly perceived. If the person is unaware of the choices, self growth is hindered.

The choices must be clearly symbolized. The person must not only be aware of alternatives but he must also have clear cut description and full understanding of choices.

He recognizes the role of social influences in the development of self concept. When social conditions are positive, the self concept and self –esteem are high. In contrast, when the conditions are negative, the self – concept and self – esteem are low. People with high self– concept and self esteem are generally flexible and open to new experiences, so they can continue to grow and self – actualize.

This situation warrants that an atmosphere of unconditional positive regard must be created in order to ensure enhancement of people’s self – concept. The client centered therapy that Rogers developed is basically based on this theory.

### **Meaning and Concept of adjustment:**

The dictionary meaning of the word ‘Adjustment’ is to fit, make suitable. Adapt, arrange, modify. Adjustment has been defined as the process by which the individual attempts to maintain a level of physiological and psychological equilibrium. (Mouly, 1967). It is also defined as the behavior directed towards tension reduction’. It is also described as an attempt on the part of the individual to strike harmonious relationship between himself and his environment.

**According to James Drever (1952):** “Adjustment means the modification compensate for or meet special conditions”.

**According to web ester (1951):** “Adjustment is the establishment of satisfactory relationship, as representing harmony, conformance, adaptation or the like”.

**According to C.V Good:** “Adjustment is the process of finding and adopting models of behavior suitable to the environment or the changes in the environment. According to Gates and Jecsild the “term adjustment is a continuous process by which a person varies

his behavior to produce a more harmonious relationship between himself and environment.

**Characteristics of well – adjusted person:**

A well – adjustment person is supposed to possess the following characteristics:

**Awareness of his own strengths and Limitations:** A well-adjusted person known's his own strengths and weakness. He tries to make capital out of his assets in some areas by accepting his limitations in others.

**Respecting himself and others:** The dislike for one – self is a typical symptom of maladjustment. An adjusted individual has respect for himself as well as for others.

**An Adequate level of aspiration:** His level of aspiration is neither too low nor too high in terms of his strengths and abilities.

**Satisfaction of basic needs:** His basic organic, emotional and social needs are fully satisfied. He does not suffer from emotional cravings and social isolations.

**Absence of a Critical of fault-finding attitude:** He appreciates the goodness in objects, persons or activities. He does not try to look for weaknesses and faults; His observation is scientific rather than critical or punitive.

**The capacity of deal with adverse circumstances:** He is not easily overwhelmed by adverse circumstances and has the will and the courage to resist and fight odds.

**Mal-Adjustment causes and Symptoms:** A Mall-adjusted person is one who is caught between a resistant obstacle and a president motivation, frustration and tension which cause behavioral disruption and disorganization. His internal conflicts cause him to be at cross purposes with himself which result into his indecision and inability to coordinate his effect in the attainment of his goal. The following are the main causes of Mal-adjustment.

**Physique:** The physique and appearance of the child play in important role in the social development of the child. If the child is physically weak, ugly and has some sensory handicaps he may be shunned by others. They develop a number of problems resulting in mal-adjustment.

**Long Sickness and Injury:** Long sickness of a child effects his social development and academic achievements in school. A child is a victim of long sickness and injury is always conscious to these ailments and fails in making adjustment with adverse situations.

**Poverty:** It has been found that there is a positive correlation between poverty and mal-adjustment in children. Highest percentages of mal-adjusted children come from low socio-economic conditions.

**Broken Home:** Children who come from homes that have been broken by death of parents, divorce, separation, physical or moral handicapped of parents are often more mal-adjusted than other children.

**Personal Inadequacies:** In addition to physical appearance, there are certain other inadequacies in children which frustrate their needs and create constant anxiety. The parents, who are ambitious and set high goals for their children irrespective of their physical and mental abilities, create frustration in their children.

**Parental Attitudes:** The important factor which effects the adjustment is the attitude of parents towards their children. The parents may reject the child. The rejected child develops feelings of insecurity, helplessness and loneliness.

### **Symptoms of Mal-Adjustment:**

There are certain symptoms which give some indication of mal-adjustment. These symptoms can be divided into the following three categories.

**Physical Symptoms:** Stuttering, stammering, scratching head, facial twitching biting nails, rocking feet, restlessness, drumming with fingers and vomiting.

**Behavior Deviation:** Aggression, lying, bullying, poor school achievement, hyperactivity, negativism and sex disturbances.

**Emotional Symptoms:** Excessive worry, fear, inferiority, hatred, extreme timidity, persistent anxiety, conflicts and tension. The ways which the individual uses to defend or escape from conflict and frustrations are known as defense mechanism.

### **Adjustment Mechanism – Rationalization Sublimation and Compensation:**

**Rationalization:** Under this mechanism, the man provides false reasons and activities to prove his own statement true e.g. Student who fails in the examinations blames teacher or question paper. Fox do not reach the grapes and said “Grapes are sour”.

**Sublimation:** Among all the defense mechanisms, sublimation is the most advance one. Through the use of its operation the socially intolerable impulses and drives are successfully directed into consciously accepted channels. Their direction and aim thus become deflected and redirected towards substitute goals. It can e done through dancing, art, painting etc.

**Compensation:** This is mechanism by which an individual tries to balance or cover up his deficiency in one area by exhibition strength in another area e.g. a boy who shows weakness in studies shows excellence in verbal expression.

# **UNIT IV(Special children/Guidance and counseling)**

## **Gifted Children-- Concept Identification and Education and Educational Programmes:**

**Exceptional Children:** The term exceptional means different things to different. Some use it when referring to the particular bright children or the child with unusual talent. Others use it when they refer to any typical or deviant child. Telford and sawrey (1972) said “to be exceptional is to be rare or unusual”.

Kirk (1962) defines an exceptional child as that child who deviates from the over age or normal child in mental, physical, or social characteristics to such an extent that he requires a modification of school practices, or special educational services in order to develop to his maximum capacity.

## **TYPES OF EXCEPTIONAL CHILDREN**

- Children with Hearing Handicap
- Children with visual handicap
- Children with Mental Retardation
- Children with learning disability
- Children with orthopedic Handicap
- Children with emotional disturbance
- Children with Speech Handicap
- Children with special Health Problems
- Children with multiple handicaps
- Gifted children
- Children with creative talents
- Socially disadvantaged children

## **Gifted Children:**

Giftedness has been traditionally associated with intellectual superiority – a very high IQ score on a standardized test of intelligence. Gifted and talented children are those identified by professionally qualified persons who, by virtue of outstanding abilities, are capable of high performance. These are children who require differential programs & services beyond those normally provided by regular school programs in order to realize their contributions to self & society.

According to Ross, children & youth with outstanding talent perform or show the potential for performing, at reasonably high levels of high accomplishments when compared with others of their age, experience or environment. These children & youth exhibit high performance capability in intellectual, creative & or artistic areas, possess an unusual leadership capacity or excel in specific academic fields. They require services or activities not ordinarily provided by the schools. Outstanding talents are present in children & youth from cultural groups across all economic strata and in all areas of human endeavor.

## **Identification checklist for parents**

Parents can identify their gifted children before they enter the primary school with the help of the checklist as suggested by Witty (1995). Such identification /nomination by parents should be followed by systematic assessment by specialist.

The early use of a large and accurately employed vocabulary.

- ✓ The use of entire sentences and ability to tell or reproduce a story at an early date.
- ✓ Keep observation and retention of information about things observed.
- ✓ Interest in and liking for books.
- ✓ Early interest in calendars, telling time, and clocks.
- ✓ The ability to attend or concentrate longer period than in usual for children.

- ✓ Demonstration of proficiency in drawing, music or other art form.
- ✓ Interest in exploration and discovery of cause and effect relationships.
- ✓ The early development of ability to read.

### **Identification checklist for teachers**

The classroom teacher has the primary responsibility of identifying the gifted children. He is in a better position than in anyone else to observe the classroom behavior of children. Koogh and De Haan (1955) have suggested the following checklist:-

1. Learns rapidly and easily.
2. Use a lot of commonsense and practical knowledge.
3. Reasons things out, thinks clearly, recognizes relationship and comprehend meanings
4. Retain what he has heard or read without much drill.
5. Know about many things of which other children are unaware.
6. Can read books that are one to two years in advance of the rest of the class.
7. Perform different mental tasks.
8. Ask many questions.
9. Does some academic work one to two years in advance of the rest of the class.
10. Is alert, keenly observant and responds quietly.

It is important to note that nomination by a group of teachers is more valid than nomination by a single teacher. In any case identification/nomination by teachers should be followed by objective methods of identification and assessment by specialist.

### **Educational Programmes for the Gifted**

## **Aim of Education of the Gifted:**

In a broader sense, the aims of education of the gifted are no different from those for all other children. Feelings of self worthy, self sufficiency, civic responsibility and vocational competence are important for every one. There are however, some additional goals which are especially desirable for gifted and talented children. Gallagher (1981) has suggested two major objectives of educational programmes for the gifted and talented children.

1. Mastering the knowledge structure of discipline which includes basic principles and systems of knowledge
- 2 .Heuristic skills which include problems solving, creativity and use of the scientific methods.

The learning environment can be modified for the gifted and talented students in three ways.

**These are:-**

- 1. Flexible pacing**
- 2. Grouping and**
- 3. Special courses**

**Flexible pacing:** - is a strategy that accelerates the student to a level in the school programme that is higher than the level of his/her age-mates. this strategy involves the following:-

1. Early admission in the school or college
2. Continuous progress at ones own rate.
3. Skipping (by passing) subjects and receiving some instructions at a higher level with another group of students while remaining with the peer group for most of the instruction.

4. Skipping grades (double promotion)
5. Concurrent (dual) enrolment at two levels-secondary and post secondary
6. Covering the course in a shortened period of time and pursuing special courses during the rest of the time.

**Grouping:** - students can be grouped on the basis of performance or aptitude. Having all students with higher performance ability in one group allows the teacher to proceed much more swiftly and in greater depth. It can be a various types:-

- ✓ Cross-age and multi-age grouping of students on the basis of similar interest or skills .
- ✓ Homogenous grouping of students in a particular class on the basis of similar skill level.
- ✓ Cluster grouping within a regular class in which a cluster group (4-10) of students receives academic support from the cluster teacher.
- ✓ Subject grouping in which students are grouped for specific subjects on the basis of their performance or attitude in that subject.
- ✓ Part time placement in a regular class with part-time placement in a special class for specialized instruction.
- ✓ Full time placement in a special class.

**Special course:-** in the secondary level special courses can be organized for gifted and talented students. These include

- Honors course
- Advanced placement courses or college level courses
- Special school courses

- Residential high school courses not avail in most high schools.

Besides the above discussion further modification needs to be done.

**Modification of content: it includes the following-**

- i. Content acceleration
- ii. Content enrichment
- iii. Content sophistication and
- iv. Content novelty.

**Teaching cognitive strategies:-**

One objective of all educators of gifted and talented students is to increase or enhance their capability in problem finding and problem solving. Problem finding is the ability to review an area of study and to perceive those elements worthy of further analysis and study. Problem solving is the ability to reach previously determined answers by organizing and processing the available information in a logical and systematic fashion. Along with enhancing their problem finding and problem solving skills gifted and talented students should be guided to extend their intellectual fluency through brain storming. The four ground rules for brain storming are as follows:-

- ✓ No criticism should be allowed when student present an idea.
- ✓ The more ideas the better.
- ✓ Students should be encouraged to integrate and combine ideas. .
- ✓ Evaluation should take place after all ideas have been presented

## **Mentally retarded children**

We have people amongst us, some who are rich and others who are poor, some who are tall and some who are short, and some are fair and some are dark. Some people are strong and some others are weak. Similarly we have people with different mental abilities-average, more than average and less than average. People with less than average mental ability are called mentally retarded. Such people have difficulty in changing their way of functioning appropriate to the various situations in every day life. The term mental retardation and mental deficiency, mental handicap and mental sub-normality refer to the same condition. The term used in the past such as amentia, idiocy, feeble minded, moron, imbecile and oligophrenia are now obsolete.

The most comprehensive definition given by the American association on mental retardation in 1983 is “Mental retardation refers to significantly sub-average general intellectual functioning resulting in or associated with concurrent impairment in adaptive behavior and manifested during the developmental behavior.

### **Classification of MR**

There are mainly three methods of clarifications of mentally retardation. they are medical, psychological and educational. The psychological and educational classifications are more commonly and widely used than the medical classification.

The psychological classification system uses the term mild, moderate, severe and profound depending on the severity, retardation. The intellectual level in terms of IQ score of these four groups Of MR Children is presented below:-

**Mild Retardation IQ 55-70**

**Moderate Retardation IQ 40-54**

**Severe Retardation IQ 25-39**

**Profound Retardation IQ below 25**

The educational classification system uses the term educable trainable and custodial depending in the educational needs of retarded children. The IQ ranges of educable

mentally retarded, trainable mentally retarded and the custodial mentally retarded are given below

**Educable Mentally Retarded-IQ 50-75**

**Trainable Mentally retarded-IQ 25-50**

**Custodial Mentally Retarded –IQ below 25.**

The educable mentally retarded children are those who can be taught the basic academic subjects. The trainable mentally retarded are those children who can be taught functional academics with emphasis on self-help and vocational skills. The custodial mentally retarded are those children who require constant and special care specially in a residential institution, the mildly retarded and some moderate retarded children, having IQ 50 and above can be integrated in the general school.

**Identification and placement of MR Children**

**Identification of parents:-**

- a. Growth and development of children follow a pattern. Every child passes through certain stages at particular time in his life
- b. These stages are called milestone of development as it helps in identifying children who have delayed development. Some of the common milestone of development as to help in identifying children who have delayed development.

**Identification by Teachers:**

The following identification checklist is recommended by the NCERT, New Delhi for identification of MR Children who are already in school.

- ✓ Display poor academic achievement constantly.
- ✓ Relies too much on presentation of concrete objects
- ✓ Has a short attention span.

- ✓ Displays short term memory
- ✓ Has a poor self image
- ✓ Lacks self confidence
- ✓ Has restricted communication
- ✓ Seeks repetition and practice
- ✓ Does not take any initiative in groups activities.
- ✓ Often inattentive and distracted
- ✓ Needs immediate reward.
- ✓ Displays fear of failure
- ✓ Has poor muscular co-ordination
- ✓ Faces difficulty in doing things for himself
- ✓ Has problem in understanding instruction
- ✓ Is unable to sit in one place for more than a few minutes.
- ✓ Exhibits restless activities like tapping, pulling and so on.
- ✓ Has problem in speech.

### **Counseling and guiding principles for mentally retarded children**

- Data collection\_ maximum information about such children should be secured and their interests should be discovered
- Special classes for such children
- Teacher should develop a positive and optimistic view about the educability of such children

- He should create favourable conditions in his class and the school for social and academic integration of MR children
- Partial segregation: It has been stated, the children should be included in the total school setup, regularly participating in assembly programs, organized play, and other activities enjoyed by all children. The problem should be clearly explained.
- Short assignment should be given to the students. Assignment should be broken up into short and simple units.
- Sufficient drill work should be done.
- Frequent summaries of the important points of discussion should be use .
- Pupils should be praised occasionally when they have their assignment well.
- Good set of tools should be provided for proper evaluation.
- Supervision should be very close.
- Auditory and visual aids facilitate learning among such children.
- Course and curricula should be selected by the students on the basis of aptitude, interest and need with the help of their councilors.
- Vocational programmes should not be forced upon slow learners as such children do not always have the necessary aptitude to acquire vocational skill.
- Equality of opportunity in recreational programmes.
- Remedial teachers may be appointed who meets such students twice a week.
- All agencies engaged in the children's welfare work, should co operate to help and guide slow learners.

## **Delinquency**

Delinquency is considered as an anti social behavior. In other words, its behavior which is unsocial in nature. Actually speaking delinquency means to deviate or fall away from the normal path.

According to Hadfield, "Delinquency is primarily a term of social application." It is failure in social adaptation when an individual fails to conform to the demands of society his behavior is considered as anti-social.

Literally speaking delinquency means to deviate or fall away from the normal path. From the legal point of view, delinquency is considered contrary to criminal law. Delinquent acts may result in arrest or punishment by the court law. It is a strange paradox that we feel sympathetic towards the child with physical handicap, but the delinquent child usually evokes more hostility than sympathy. According to psychologist's delinquency is considered as a deficiency in the form of super-ego. It is considered as holes in super ego. Sociologists pointed out that who violate the social norms and behavior in anti social manner are called delinquency.

According to Burt, "A Child is to be regarded technically delinquent when his anti-social tendencies appears grave that he becomes or opt to become the subject official of action".

In brief delinquent act is behavior that violates norms of the society. Delinquent behavior is hostile and rebellion against parents, teachers or the social organization. Delinquency means anti-social behavior or act.

## **Identification**

It is very difficult to list down the delinquent acts because of cultural variations and different socio-economic conditions of the country. Infact no universally acceptance list of delinquency act be drawn. The common types or norms of delinquency are given below:-

- ✓ Bullying

- ✓ Smoking
- ✓ Stealing
- ✓ Teasing
- ✓ Forgery
- ✓ Telling a lie
- ✓ Truancy
- ✓ Obscene
- ✓ Drawing
- ✓ Sex delinquency i.e. masturbation, homo\_ sexuality, immature sexual relations etc.
- ✓ Prostitution
- ✓ Abducting and raping
- ✓ Tendency to escape
- ✓ Exhibitionism
- ✓ Running from home
- ✓ Wondering aimlessly
- ✓ Drug addiction
- ✓ Moral conduct around school
- ✓ Vagrancy
- ✓ Vulgarity

- ✓ Frequent visits to place whose existence violates law.

## **Prevention of Delinquency**

From the prevention and the cure of delinquency, not only the teachers, but the parent's social workers government and other voluntary agencies have to work together and fight against the social evil jointly. The following steps are suggested for the purpose.

### **Congenial and proper atmosphere in the home:**

Parents should pay special attention to home environment. They should live amicably, understand their children and provide congenial home environment used on harmony and happiness.

### **Sympathetic and affectionate attitude**

Love and sympathy shown by the parents prove very useful in the treatment of delinquency children must feel a sense of security. A delinquent child gradually acquires confidence.

### **Parents should understand their children**

“Parents have to be educated so that they may understand children need and choice, their mental traits, urges and emotions. Parents should have the knowledge of child guidance. They should not give large amount of pocket money to their children. They should also keep or watch on the activities and friends of their children.

### **preventive measures**

Parents must take preventive measures if the Childs behavior tends to be abnormal.

**Parents should take care** of the education of their children, known their progress and get other information about their children. They must not impose their own ambitions upon their children.

### **Steps to be taken by schools:**

Schools can play an effective role in the prevention of delinquency among children by adopting the following measures.

1. There should be efficient and experienced teachers. They should try to resolve the problems of their students psychologically.
2. The school should provide co-curricular activities as the help in the sublimation of various instincts and emotions. Students remain busy in the healthy pursuits.
3. Co-ordination between homes and schools should be maintained. the school can adopt a few more preventive measures such as:

- ✓ Good and effective methods of teaching.
- ✓ Immediate investigation and if necessary treatment at the first signs of anti-source behavior.
- ✓ Providing recreational spare-time active in groups.
- ✓ Provisions of special schools so as rehabilitation such children in the society.
- ✓ Provide creative crafts or vocations.
- ✓ State Government should also take necessary preventive measure. Similarly voluntary social agencies should also extend full help and cooperation to overcome the menace of delinquency.

In brief there is a need for a comprehensive and broad based program to attack this problem. The problems of delinquent children may be understood and solved through a humanistic approach.

## **Guidance –concept and Principles:-**

Guidance is the help given by one person to another in making choices and adjustments and in solving problems. Guidance aims at aiding the recipient to grow in his independence and ability to be responsible for himself. It is a service that is universal not confined to the school or the family. it is found in all phases of life-in the home, in business and industry, in government in social life, in hospital and in prisons, indeed it is present wherever that are people who can help.

Guidance is an integral part of education on a world of complex responsibilities every person needs guidance in one way or the other. life is full of challenges so, everyone needs guidance and without guidance, a person stands confused at the crossroads, not knowing where to go. Guidance is an active and dynamic process. it helps the individual in understanding himself.

Guidance means assistance given by expert persons to an individual to develop his personality and to achieve proper direction in life.

According to Jones, guidance is a process and technique through which a person is able to receive help in solving personal and other problems.

According to Woodworth, guidance helps an individual to develop his personality fully and enables him to serve the society to the best of his capabilities and talents.

Flower says, the purpose of guidance is to help the student to make more favourable adjustment.

### **Principles of Guidance:**

Guidance of all kinds is based on certain basic principles. The chief aim o guidance is to help the individual to attain his full personal, social, professional and cultural and moral development. Several significant principles of guidance are as follows:

#### **Principles of all round development of the individual:**

Every aspect of an individual personality constitutes a significant factor of his total pattern of attitudes and behavior. Hence guidance services, which aims at bringing about desirable adjustment in any particular area of personality must take an account the all round development of the individual.

**2. Principle of individual differences:**

Although all human beings are similar in many respect individual differences must be recognized and considered in any effort aimed at providing guidance to a particular child, adolescent or adult.

**3. Principle of individual co-operation:**

Existing, social economic and political unrest is given rise to many mal-adjustment factors that require the co-operation between experienced and trained guidance experts and the individuals having problems.

**4. Principle of continuity:**

Guidance should be regarded as a continuous process of service to an individual in different stages of his life.

**5. Principle of elaboration:**

Curriculum materials and teaching procedure should be elaborated according to the view points of guidance.

## **6. Principle of adjustment:**

Although guidance touches every sphere of an individual's life, it is chiefly concerned with interference of an individual's physical or mental health with his adjustment to home, school, society and vocation or with the ill effects of the areas of his physical and mental health.

### **Principles of expert opinion:-**

Specific and serious guidance problems should be referred to persons who are trained to deal with particular areas of adjustment for their expert opinion.

### **Principles of true function:**

The function of guidance is to help a person to

- i. formulate and accept worthwhile and attainable goals of behavior and
- ii. Apply these objectives in the conduct of his affairs.

### **Principle of evaluation:**

To give guidance intelligently a programme of individual evaluation should be conducted for this purpose accurate cumulative records of progress and achievements should be prepared and made available to guidance workers and organized guidance programmes should be flexible according to the needs of the individual and community.

### **Principles of period appraisal:**

It should be made of the existing school guidance programme. The success of its function should rest on the outcomes that are reflected in the whole guidance programme.

## **Types of guidance:**

Guidance is mainly divided into three types these are educational guidance vocational guidance and personal guidance. it may be kept in view that these three types of guidance may be given simultaneously to an individual because these three types of guidance are interrelated and deal with the life of an individual as a whole.

## **Educational Guidance:**

This is a vital area, which is found common in the list of the thinkers in guidance, prepared in any corner of the world.

According to Traxler, guidance enables each-individual to understand his abilities, interests and personality traits, to develop them as well as possible to relate them to his life goals and finally to reach a state of complete and mature self-guidance as a desirable citizen of a democratic social order. Guidance is this vitally related to every aspect of the school the curriculum. the methods of instructions, the supervision of instruction ,disciplinary procedure attendance problems of scheduling. The extra curricular the health and physical fitness programme have and community relations.

Brewer defined it, “Educational guidance is a conscious effort to assist in the intellectual growth of an individual. Any thing that has to do with instruction or with learning may come under the term of guidance.

Miller observes,” Guidance as a form of systematic assistance where by students are aided in achieving satisfactory adjustment to school life.

## **Need of Educational Guidance:**

Following are some of the reasons which indicate the importance of educational guidance.

1. Our educational system is defective; it is not according to the age, attitude and interest of the pupils.
2. Children have a limited vision about the subject offered.
3. We need specialists in different branches and thus it should start from the stage.
4. A wrong choice of subjects is not only individual loss but a national wastage.
5. Proper educational guidance will avoid wastages and stagnation in education.
6. It will reduce a rush towards college education.
7. It will solve the problem of educational unemployment.
8. This will bring the right man at the right place on the right occasion.

## **Principles of Educational guidance**

- 1) The interest needs and purposes of students shared be the guiding factors.
- 2) It should serve all the pupils.
- 3) The guidance service should kept in view the total personality of child.
- 4) It should keep in view the total social environment in which the people lives.
- 5) it should try to solve the specific needs of the child.
- 6) Problems should be talked at the limited stage.
- 7) All necessary information regarding occupational educational requirement should be collected.

8) the service should seek cooperation of all agencies.

**Aims and Objectives of Educational Guidance:**

1. To help the student to secure information regards the possibility and desirability of further schooling.
2. To help the child to know the purpose and functions of each type of school that might attend.
3. To enable him to know in details the offering of the school that he might attend.
4. To help him to know the requirement for entrance into the school of his choice and taste.
5. To help him to adjust himself to the curriculum, the school and the social life connected with it under this heading would be included:
  - a. To help him in the selection of subjects.
  - b. To help him the selection of books for each subjects.
  - c. To help him in developing good stud habits.
  - d. To help him in selecting hobbies
  - e. To help him the selection of co-curricular activities.
  - f. To help him to build good social relationships.
  - g. To help him to find out his tastes, aptitude and interest
  - h. To help him in knowing the availability of scholarship loans etc.
  - i. To help him to find out his physical, mental and emotional handicaps and treat them.
  - j. To help him to know about the various opening available after finishing the school career.

### **Objectives of Educational Guidance:**

Education policies commission of the national educational association, USA (1938) recommended that there should four general objectives in regard to education. These are

1. The objectives of self-realization
2. The objective of human realization
3. The objectives of economic realization
4. The objectives of civil responsibility.

The other objectives of educational guidance are:

1. The main objective of educational guidance in schools is to help students to understand their strength and weakness and to help in the process of adjustment.
2. To increase the accuracy of the individual self-perception.
3. To suggest courses of study to individual students.
4. To encourage the harmonious development of the students.
5. To identify the students who are gifted, mentally or physically deficient so that special arrangement are made for them.
6. To enrich them with the world of work so that they can make wider choices of them vocations and progressions.
7. To assist students in the positive development of attitudes, value system adjustment skill and decision making competencies.

### **Vocational Guidance:**

Another important type of guidance is vocational in nature. As a matter of fact the guidance movement in its beginning was vocational the various definition given are as

follows. “National vocational guidance Association of 1937 adopted the following definition:

“Vocational guidance is the process of helping a person to develop and accept an occupation, prepare for it, enter upon and progress in it”.

Myers G.E “Vocational guidance is fundamentally an effort to conserve the priceless nature capacities of youth and the costly training provided for youth in the schools. It seeks to conserve the richest of all human resources by aiding the individual to invest and use them where they will bring greatest satisfaction and greatest benefits to society.

### **The need for vocational Guidance**

#### **1. Complex nature of society:**

Our society in the past was simple and of the agricultural type. The modern society is industrial and complex various vocations are open for the child today. To enable the child to choose his vocation correctly, it is necessary to impart vocational guidance.

#### **2. Individual differences:**

There are various types of psychological differences among children. Every child has its interest capacities and aptitude for work. He chooses his action accordingly. It is the reason the vocational guidance becomes necessary.

#### **3. The health point of view:**

A wrong choice of occupation is determined to the health of the workers. It may affect the eyesight or shatter the nerves of the individual if he makes a wrong choice of progression. Hence it is necessary to provide for vocational guidance.

#### **4. Personal and social values:**

It has been rightly said, “Occupation is not merely a means of earning a livelihood but also a way of life, a social role”. It means that the choice of an occupation involves the happiness of a worker. His satisfaction leads to his personal growth and his

contribution to human welfare. A dissatisfied worker is a curse to himself and the society. Hence it is necessary to have vocational guidance.

4. **Absence of vocational guidance** will lead to three fold losses. Firstly is a loss to the individual. If the individual chooses a wrong profession, he losses in terms of confidence and further progress. He does not put in his best and when tries to take up some other profession may not be so successful, if he had planned for it earlier.

Secondly it is loss to employer. A wrong man at a wrong place at the wrong hour means great loss to the industry. The quality and quantity of work suffers. Moreover the time spent on the selection of the earlier work is also wasted. A wrong man in industry means in loss to the nation as well inferior good at a higher cost are made available to the society and the nation suffers.

#### **Aims of Vocational Guidance:**

1. Enabling the child to understand the nature of the trade he is going to join in.
2. Finding out specific abilities required for the trade.
3. Providing opportunities to the child during school hours, to find out his capacities in relation to the requirements of the job.
4. Developing a right type of orientation towards honest work for the profession.
5. Developing a capacity of collecting occupational information and proper analysis.
6. Making a critical self evaluation in rotation to the requirement of the job.
7. Rendering financial assistance to those pupils who have a capacity to get a job but due to financial reasons they are not able to do it.
8. Providing information regarding the vocational training provided in different institutions
9. Bringing about proper vocational adjustment.
10. Developing value for honest work in the profession.

## **Principles of vocational guidance:**

Following are principles of vocational guidance.

- i. Client centered principles
  - ii. Vocational Guidance Personnel centered principles.
  - iii. Organisation centered principles
  - iv. General public centered principles.
- I. Client centered principles:** These include
- a. Making guidance service available without interruption.
  - b. Guidance covering all clients
  - c. Making guidance programme client centered
  - d. Making choice by the client himself.
- II. Vocational guidance personal-centered principles:**
- a. Allowing field workers to undertake follow up studies.
  - b. Offering placement services.
  - c. Using innovative methods and techniques.
  - d. Making provision for individual and group guidance programme
  - e. Providing in-service training and maintaining professional efficiency.
- III. Organizational centered principles**
- a. Seeking co-operation from similar organization.
  - b. Making adequate supply of materials, space and budget.
  - c. Offering placement services, adequate staff and adequate supply of material.
  - d. Preparing adequate staff for service
- IV. General public centered principles:**
- a. Mobilizing public opinion.
  - b. Making public receptive to guidance programme.
  - c. Making public conscious of careers of young members of the society.

- d. Co-operation to the guidance worker.

## **Personnel Guidance:**

**The third kind of guidance is the personnel guidance.** It is concerned with the problems of health, emotional adjustment, and social adjustment including recreation and leisure time activities.

Whatever is not by educational and vocational guidance may convent be placed in the area of personal guidance. In this manner personnel guidance deals with all those problems of life, which are not treated under education and vocational guidance.

Some of the definitions are as follows:

According to Myers”. The individual needs assistance in choosing recreations which are suited to his personnel characteristics. Hence recreational guidance becomes apart”.

**According to Ruth Strange:** “Personal guidance is the assistance given to an individual to solve his personnel problems. Such as emotional and social adjustment, economic and social relationship and problems connected with his physical as well as mental health.”

In the view point of Wilson, the purpose of personnel guidance is to help the individual in his physical, emotional, social, moral and spiritual developments and adjustment.”

### **Aims of Personal Guidance**

Personal guidance may be recognized as the process of providing this help. In the light of it, some aims of personnel guidance worked out by Jones are as under:”

1. To assist the individual gradually to develop life goals that is socially desirable and individually satisfying.
2. To help him to plan his life so that these goals may be attained and to integrate his activities with reference to these goals.

3. To help him to grow consistently in ability to adjust himself creativity to his developing life goals, to recognize limitations and his strength and to build up his own peculiar powers and interest to an enriched and resourceful personality.

4. To assist the individual to grow consistently in ability to live with others so effectively and his own worthy purposes, that he may experience the satisfactions that come from association with different kinds of people and that he may be a partner with the who seek to provide a better society in which to make a living and to live.

5. To help him to grow in self directive ability.

Thus it is not only to create self understanding and self acceptance but to develop in the individual also the capacity to mobilize his own resources and to assure responsibility for solving his own problems. The aim of personnel guidance is to develop the capacity for mature self defectiveness and self guidance.

Personal Guidance at Different stages:

**Pre-primary stage:**

It helps children in learning to get along with others children are taught to express themselves by working with hands and through music, dance and drama.

**Elementary stage:**

It takes into account the problems of health, feelings of security, social acceptance, discipline and leisure time activities. Through personnel guidance pupils of elementary school should be encouraged to develop self discipline.

**Junior high school stage:**

It deals with problems of pre-adolescent boys and girls are enabling to recognize and understand the problems of adjustment through personal guidance. They are encouraged to assume responsibility for their own welfare as well as for others. They are encouraged through personal guidance to know more about their society and culture.

High School stage; it is concerned with mostly the problem of personal and social adjustment with increase in age and experience adolescent boys and girls have to attain

social maturity. They have to know their potentialities as well as their limitations. Personal guidance can be helpful in this matter.

**College and universities:** Personal guidance at the college and university level is a continuation of the person guidance at secondary. But its scope is widened with a view to develop in young adults a sense of social service, social responsibility, patriotism and tolerance. In every society people belonging to different faiths at ways of life, live and work. It is therefore extremely desirable that through personal guidance young adults are enabled to have mutual respect and regard for people belonging to different faiths, finally personal guidance at the higher stage should help your men and women to appreciate the important of religions and moral values in life. They should encouraged to study the fundamental principles of all religions and discover for themselves the underlying unity, which is to be found in different religious doctrines. The common problem that is usually seen in the adolescent stage in actual which up roots some times their progressive step. If they are not made aware of the problem unyielding the secrets their life at this stage becomes more puzzling . Otherwise they will create curiosities in the sex problems that hinder their growths considerable.

Problems of a adolescence vary in nature from person to person. They are not peculiar to any particular person. They are seen in common to anybody in the universe.

It is one of the important functions of guidance programme to attend the personnel needs of the pupils in all aspect of their life.

The personnel needs of an individual include all the aspects of his varied growths in educational and vocational fields and in all other works of his life whether private or not.

It is therefore essential that pupils are guided properly by parents and teachers in their personal social problems. Many of the individuals are socially maladjusted because they have not been given proper guidance in handling their personnel and social problems. It is foremost aim of personal guidance for developing all personal qualities that would enable the individual for a fruitful life.

## **Organization of Guidance Programme:**

Organization means systematic planning coordination and conduct of certain activities with an administrative framework, in which duties are allocated and responsibilities defined. It also implies laying down objectives in clear terms, mastering and utilizing of resources to achieve those ends.

## **Need of organizing Guidance Programme**

- 1. Facilitates use of skill:** It facilitates the use of skill, training and interest of individual staff members. Recognition of these special interest and skill-will mean that the teacher who has attended summer schools to take courses in educational psychology and in principles and techniques of counseling may have an opportunity to use the skills in the guidance programme.
- 2. Co-ordination:**  
**Secondly makes possible the co-ordination** of the work of the many staff members so that instead of divergent, unrelated types of activities, the work of each, person will relate to that of others in an integral pattern. Guidance work is team work, it has been coordinated.
- 3. Saves time and effort:** Thirdly value of organization is the economy of time and effort by the principal as well as by the staff members involved.
- 4. It helps in self-realization and in maintaining human relationships.**
- 5. It helps teachers to understand individual children better through such devices as personality tests, intelligence, aptitude tests achievements tests, interest inventories, observation technique and devices of interview, sociometry.**
- 6. Improvement in classroom relationship:** It improves classroom relationship and emotional climate through emphasis upon democratic procedure.
- 7. It utilizes community resources which can contribute to the welfare of children.**
- 8. Better adjustment:** It helps the individual in adjusting with himself with family and with community or society at large.

## **Elements of organization of guidance programme at elementary and secondary level:**

To run guidance programme effectively in our schools, we must full fill the following conditions first.

### **1. The entire School administration should believe in the philosophy of guidance:**

Without this, not much is possible. They should also implement guidance decisions.

### **2. Allocate funds provision in the Budget:** The state department or school must allocate some funds for running the programme there must be some provision for it in the budget without budgetary provision it can't be run.

### **3. Facilities:** Under this head, we must have (i) A special room for guidance & (ii) Adequate supply for tests and other material.

### **4. Time:** There must be a special period provided in the time table of every class for guidance. This way, the school acknowledges the importance of guidance work of time table is not provided, this programme in school will fail.

### **5. Adequate Personnel:** Guidance is to be run with the cooperation of the entire staff. However, the following have special role to play:

- (a)** The head of the school. ‘
- (b)** The teacher especially class teacher.
- (c)** The counselor
- (d)** The Psychologist
- (e)** The health specialist

Let them form a guidance council or committee in the school periodical meeting of the committee should be head to through out problems and reasons the work already done.

### **6. An Adequate System of Pupil Assessment and Recording on date:** It is the most essential pre-requisite without such useful and reliable knowledge about the individual child; nothing can be done with out help him. A reliable commutative record should be maintained parental support must be ensured.

**Role of the Principal or the Headmaster in organizing Guidance Programme:** The headmaster or Principal plays very important role in the guidance programme. The success of any programme to a large extent, depend, upon the personality of the headmaster his faith, hearty attitude and strenuous efforts on organizing the guidance programme. He is regarded and “hub” in organizing guidance programme. The functions of headmaster in the process are:

1. Recommends appointment of counselor.
2. Provides facilities
3. Assigns duties.
4. Inspires leadership
5. Reports to parents.
6. He helps the psychologists, psychifrist, physicians and teacher in organizing guidance programme.

**The function and role of teacher in the organization of the guidance programme:**

Teachers, because of their closer contact with pupils are in better position to provide the conditions needed for effective counseling them ant other members of the staff. It is true that learning to use test remits and cumulative records and studying guidance, philosophy and application of guidance technique require a considerable amount of teacher’s time at first and it may call of reduction in other type of services in the beginning. But in the end it should greatly increase teaching efficiency for it will lead the teacher to become better acquainted with the abilities and needs of different pupils and will help the teacher to see them and individual rather than merely as member of a group.

Even the teachers were interested only in the formal presentation of the subject matter an adequate job could not be done if he or she has not ascertained whether or not the background of the pupils was sufficient to make class presentation comprehensive. It is obivious that the first thing is the study of pupil.

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**B.G. 3<sup>RD</sup> YEAR 2016**  
**“STATISTICS IN EDUCATION”**  
**Unit –5**

**A) Meaning and types of Data**

The word data is plural the singular being datum. Dictionary meaning of the word datum is fact and therefore is plural, the word data signifies more than one fact. In a wider sense, the term data denotes evidence or facts describing a group or a situation. In other words, it may refer to any details regarding numerical records or reports. However in practical sense the statistical term is generally used for numerical facts such as measures of heights, weight and scores on achievement and intelligent tests.

## Types of Data

Data are of two kinds

1. Continuous series
2. Discrete series

1. **A continuous series:** or data is one which is capable of any degree of sub division though in practice divisions smaller than small unit are gravely met

For example : I.Q achievement scores mental test scores fall into continuous series within the given range any score integral or fractional ,may exist and meaningful, the mental and physical measurement yield data on continuous series .The weight of a person is 50 kg and I.Q is 110.5 .Gaps in a truly continuous series can be attributable to get enough data in the precision of measurement fulfills the gaps .

### 2. Discrete series

A discrete series or data exhibit or indicate the real gaps, the data on nominal scale are on discrete series. A class consists of 35 boys and 25 girls. There is real gap between the two groups .The population of city consists of 6.25 percent children and 40.4 adults.

In the field of psychology and education discrete data are obtained in terms of frequency on nominal scale of measurement provides continuous series ,statistical methods and techniques are used for analyzing and interpreting data .The data is master while statistics is assists to make the raw data meaningful .Therefore it is essential to understand source of data and ways of collecting data.

### B) Conversion of raw scores into frequency distribution

When the data is small we can easily analyze and interpret it without its tabulation and grouping .If a large data is not systematically classified and arranged than there is no meaning to it. The easiest way to recognize a set of data is to present it in sequence the data may be arranged in ascending order or descending order .For example let us take the I.Q of 10 children as shown below IQ 90,100 , ,85,102,103,120,110 , 115, 93.Now this data can be arranged from highest to lowest I.Q 20,115,110,103,102,110,103,102,100,99,93,90,85 .

This is the case with ungrouped data at the time a dealing a large data we have to present the data in a group .For this , the arrange of the data calculated and then the frequency of each class is counted . Range is the difference between the highest score and the lowest scores in a distribution plus one .

For an example , in a distributions, the series vary from 20 to 90 .So the range of the distribution is  $90-20+1(90.5-10.5=71)$  is equal to 71 . At the time of grouping data in a frequency distribution table we generally start the class with five and the size of the class interval does not exceed 10.Usually According to the number of frequencies against the class

interval .The frequency distribution table is prepared . But sometime we need to help to tally marks (1) in order to escape from committing mistakes in calculation .For each score , a tally marks is given to so no score will be left unnoticed . In a particular class interval we have to put four tally marks (1111) upto the frequency 4 but the fifth tall mark will be a cross line with the four tall marks (1111) .This symbolize the frequency is five , then the tally marks are counted and they are written in numerals against that class intervals . In order to check the correctness of the adult of the frequencies finally total number of cases (denoted by  $N = \sum f$ ) s calculated under the frequency column .

Let us take an example ,the score of 20 students in a class test are given below

20 22 25 85 75  
 35 45 55 65 63  
 24 29 34 37 42  
 49 49 54 72 73

This is an ungrouped data for an effective interpretation of the data,it should be arranged properly . In this distribution , he highest score is 85 and the lowest score is 20 .So he range is  $85-20+1 = 66$  .We can choose size of class interval to be 10 Now we can present the data of class interval .we can prepare a frequency distribution table with the help of tally marks as follows :

Table frequency distribution table of scores achieved by 20 students in a class test

CI	Tall Marks	frequency
80-89	I	1
70-79	II	2
60-69	III	3
50-59	III	3
40-49	III	3
30-39	III	3
20-29	IIII	5

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 $N=20$

### Graphical representation Histogram , Line graph , pie chart

**Histogram** is also known as column diagram .In case of histogram , on the x-axis we take the scores and on the y-axis we take the frequencies ,the x-axis represent the length and the y-axis (height) represent the frequencies (number of scores) .For each class interval with its frequency , rectangle is drawn on the x-axis .The boundaries of the rectangle are drawn in a continuation .At the time of drawing a histogram , we have to take into account the higher limit of the limits in the class interval .

The unit of the scale must be clear before drawing a histogram .We can choose the scale or unit according to the size of the class intervals and also the size of an accurate picture

of the relative proportions of the total frequency from interval to interval.

Class interval	Exact Units of C.I	Frequencies
55-59	54.5---59.5	1
50-54	49.5---54.5	2
45-49	44.5---49.5	4
40-44	39.5---44.5	9
35-39	34.5---39.5	5
30-34	29.5---34.5	3
25-29	24.5-29.5	3

In order to make the histogram a beautiful one, we can put different colours on the different rectangle. We can also put different marks on the different rectangle to mark all the rectangles distinct one

### Pie-diagram

Pie diagram is also known as circle graph. In pie diagram the whole data is presented through the parts of a circle and the total frequencies or value is equated to  $360^{\circ}$  the whole numerical data are converted into the pie diagram. In the following table, the number of students in the elective papers in a B.Ed Colleges are given. It will be pictorially presented in a pie diagram.

Elective Paper	No of students
.EVS	10
.Educational Guidance	20
.Educational Measurement and Evaluation	30
.Functional Administration and Management	30
Total	90

Elective Paper	No of students	Angle or circle
.EVS	10	$\frac{10}{90} \times 360 = 40^{\circ}$

.Educational Guidance	20	$\frac{20}{90} \times 360 = 80^\circ$
.Educational Measurement and Evaluation	30	$\frac{30}{90} \times 360 = 120^\circ$
.Functional Administration and Management	30	$\frac{30}{90} \times 360 = 120^\circ$
Total	90	$360^\circ$

The total number of students will be converted into angles in order to represent the number of students in a circle diagram

### Line graph

The commulative percentage frequency curve or ogive is the graphical representation of a cumulative percentage is the graphical representation of a cumulative percentage frequency distribution such as given in the table below. It is essentially a line graph drawn on a piece of graph paper by plotting actual upper limits of the class intervals on the x-axis and their respective cumulative percentage frequencies on the y-axis. Ogive differs from the cumulative frequency graph in the sense that here we plot commulative percentage frequencies on the y-axis in place of commulative frequencies.

Class Interval	Frequencies
65---69	4
60—64	3
55---59	5
50—54	6
45--49	2

Now table will be arranged with their exact limits and the commulative frequencies

Class Interval	Exact units of CI	Frequencies	commulative frequencies	% of commulative frequencies
65-69	64.5---69.5	4	20	$\frac{20}{20} \times 100 = 100\%$
60-64	59.5---64.5	3	16	$\frac{10}{20} \times 100 = 80\%$
				$\frac{13}{20} \times 100 = 65\%$

55-59	54.4---59.5	5	13	20
50-54	49.5---54.5	6	8	$\frac{8}{20} \times 100 = 40\%$
45-49	44.5---49.5	2	2	$\frac{2}{20} \times 100 = 10\%$

**B.G. 3<sup>RD</sup> YEAR 2016**  
**“STATISTICS IN EDUCATION”**

**RELATIVE MEASURES PERCENTILE AND PERCENTILE RANK**

**Q1. Explain the meaning of percentile.**

**Ans.** Percentiles are the points in the distribution of scores, which have a given percent of the case, falling below it. The total area of frequency distribution is divided into 100 equal parts. Percentiles are linked with percentages, which is equal to 100 points. Percentiles points may be represented by the symbols  $P_0, P_{10}, P_{20}, P_{30}, P_{40}, \dots, P_{100}$ . The percentiles  $P_0$  and  $P_{100}$  are the limits, which include all members of the same distribution.

Formula of Percentile

$$P = L + \frac{(PN - Cfb) \times i}{fP}$$

Where

P=Percentage of the distribution

L=Lower limit of class interval, in which desired percentile falls.

PN= Part of N, to be cannot to reach the desired percentile

Cfb= Cumulative frequency below the class interval in which percentile falls

FP= Actual frequencies in the class interval, in which the given percentile falls

I=size of class interval

Computations of Percentile

### Calculate $P_{10}$ calculation of percentile

S.No.	C.I	f	Cum.Freq. C.f	Percentile P
1.	75-79	2	40	$P_{100} = 79.50$
2.	70-74	4	38	$P_{90} = 72.00$
3.	65-69	6	34	$P_{50} = 67.83$
4.	60-64	10	28	$P_{70} = 64.50$
5.	55-59	8	18	$P_{60} = 62.50$
6.	50-54	6	10	$P_{50} = 60.50$
7.	45-49	4	4	$P_{40} = 58.25$
				$P_{30} = 55.75$
				$P_{20} = 52.83$
				$P_{10} = 49.50$
				$P_0 = 44.50$

Steps:

1. Find out given percent of N i.e. 10.

Percent of 40, which is N in this example

$$PN = P/100 \times N$$

The value of 10 percent is;

$$PN = 1/1 \times 4 = 4$$

2. Locate the value of 4 in cumulative frequency. It falls in the class interval of 45-49. It should be underlined to locate the exact value for substituting it, is the formula.
3. Now, find out other values required for the formula like L=Lower limit of class interval in which 10% of the class fall i.e, 44.5.
4. Cfb=Sum of frequencies below the class interval in which 10% of the class falls i.e. 0, as there is no frequency below class interval 45-49.
5. FP= Actual frequencies against the class interval in which 10% of the class fall i.e. 4
6. I= size of class interval i.e. 5 in this example
7. L=44.5

$$PN=4$$

$$Cfb=0$$

$$FP=4$$

$$I=5$$

By substituting the values, in the formula, we get

$$P=L+\frac{(PN-Cfb)xi}{fP}$$

$$P=44.5+\frac{(4-0)5}{4}$$

$$P=44.5+4/4 \times 5$$

$$P=44.5+1 \times 5$$

$$P=44.5+5$$

$$P=49.5$$

Percentile Rank

**Q. Explain the meaning of percentile of rank.**

**Ans.** The percentile rank is the position on a scale of 100, to which the subjects score entitle, him. Percentile rank is reverse of percentiles. Percentile rank is the position on a scale of 100, to which any score entitles him. It means if an individual has obtained a score of 50 in distribution. We have to see what is the position of score of 50 in a frequency distribution. If there are 30% of the scores falling below 50, it means that a score of 50 is above 30% of the class

$$P_{10}=16.16$$

Formula of Percentile Rank

$$PR=100/N (Cfb+\frac{X-L}{I} \times fP) \quad I$$

In which

PR=Percentile Rank

N=Number of total frequencies

X= Score, for which, PR is to be calculated

Cfb= Number cumulative frequencies below the class interval, in which PR falls

L= Lower limit of the class interval, in which, PR falls.

fP+ Actual frequencies of the class interval in which PR falls.

I= Size of class interval.

Calculation of Percentile Rank

Calculate PR<sub>52</sub>

S.No.	C.f	F	C.f
1.	75-79	2	40
2.	70-74	4	38
3.	65-69	6	34
4.	60-64	10	28
5.	55-59	8	18
L=495	50-54	6	10
	45-49	4	4c <b>f</b>

$$N^2=40$$

By substituting the values in the formula, we get:

$$N=40$$

$$Cfb=4$$

$$X=52$$

$$L=49.5$$

$$I=5 \quad fP=6$$

$$\text{Formula: } PR = \frac{100}{N} (Cfb - \frac{X-1}{I} \times fP)$$

$$=PR = \frac{5}{2} (4 + \frac{52 - 49.5 \times 6}{5})$$

$$=PR = \frac{5}{2} (4 + \frac{2.5 \times 6}{5})$$

$$=PR = \frac{2.5(4 + 3.0)}{5}$$

$$=PR = 2.5(7)$$

$$=PR = 2.5 \times 7 = 17.5$$

$$=Pr = 17.5 \text{ or } 18$$

Hence PR = 175.5 or 18

### Q. Bivariate Correlation

**Ans.** When distribution is not normal or when the shape of the distribution is not known, there is a need for a measure of correlation that involves no assumptions about the parameters of the population.

There are ways to avoid making any assumption by ranking the score, according to the size and making further computations on ranks rather than on original scores. When ranks are used in place of actual observations or sometimes when the number of observation is small and parametric assumptions are not met, the data is reduced to ranks (original) to get a coefficient or rank correlation as denoted by P (read as Rho) instead of r. It is also known as spearman's P, called Spearman's Rho.

Spearman's co-efficient of correlation (P) is determined with the help of the formula given below:

$$P = 1 - \frac{6ED^2}{N(N^2 - 1)}$$

Example: Calculation of co-efficient of rank correlation between marks obtained by 10 students in two subjects Maths and Physics.

S.No.	1 Marks in Maths	2 Marks in Physics	3 R <sub>1</sub>	4 R <sub>2</sub>	5 D	6 D <sub>2</sub>
1.	10	8	10	9	1	1
2.	11	9	9	8	1	1
3.	13	7	8	10	-2	4
4.	15	10	7	7	0	0
5.	16	14	6	4	2	4
6.	17	15	5	3	2	4
7.	18	16	4	2	2	4
8.	20	11	3	6	-3	9
9.	21	13	2	5	-3	9
10.	22	17	1	1	0	0

=10		+8 -8 $\Sigma D=0$	$\Sigma d^2=36$
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Here in the example

$$\Sigma d^2=36$$

$$N=10$$

$$\begin{aligned} \text{Formula} &= P=1-\frac{\Sigma D^2}{N(N^2-1)} \\ &=1-\frac{216}{10(100-1)} \\ &=1-\frac{216}{1.99} \\ &=1-\frac{216}{990} \end{aligned}$$

$$= 1-.218$$

$$= 1 - .218 \text{ or } P=1-(0.22)$$

$$=0.782 \text{ or } P=78$$

The value of coefficient of correlation comes out to be 0.782 or +0.78. It shows there is a very high positive co-efficient of correlation between the marks of the students in the subjects of Maths and Physics. In other words, the performance of the students in Physics and Maths is highly related to each other.

**Q. Pearson’s Product Moment Method of Correlation**

**Ans.** Product moment method was developed by Karl Pearson. It is denoted as T. The value of T may be regarded as an arithmetic mean of standard scores.

$$r = \frac{\Sigma xy}{\Sigma x^2 \Sigma y^2}$$

Where r=Co-efficient of correlation

X=deviation of x scores from the mean (X-M)

Y=deviation of ‘y’ scores from the mean (Y-M)

$$a. \quad R= \frac{N\Sigma(xy)-(\Sigma x)(\Sigma y)}{(N\Sigma x^2-(\Sigma x)^2)(N\Sigma y^2-(\Sigma y)^2)}$$

$$(N\Sigma x^2-(\Sigma x)^2)(N\Sigma y^2-(\Sigma y)^2)$$

Where r= coefficient of correlation

X=scores in the x column

Y=scores in the y column

N=number of cases

Students	X	Y	X (x-m)	Y (y-m)	Xy	X <sup>2</sup>	Y <sup>2</sup>
A	15	60	-10	10	100	100	100
B	25	70	0	20	0	0	400
C	20	40	-5	-10	50	25	100
D	30	50	5	0	0	25	0

E	35	30	10	-2	-200	100	400
$\sum x=125$	$\sum y=250$				$\sum xy=250$	$\sum x^2=250$	$\sum y^2=1000$

Mean of x =  $125/5=25$

Mean of y =  $250/5=50$

$$r = \frac{\sum xy}{\sum x^2 \sum y^2}$$

$$r = \frac{-250}{250 \times 1000}$$

$$r = \frac{-250}{250.000}$$

$$r = \frac{-250}{500}$$

$$r = -0.5$$

Product moment correlation

Coefficient = 0.5

## Statistics in Education & project work (optional)

### Variability or Educational Statistics:

#### Q1. What do you understand by variability?

**Ans.** The term 'Variability' refers to the scatter or spread of the separate scores around their central tendency. These measures tell us how much our group is homogeneous and how much heterogeneous.

#### Q2. What are various ways of measuring variability?

**Ans.** There are four ways of measuring variability. They are:

1. The Range
2. The Quartile Deviation
3. The Average Deviation or Mean Deviation
4. Standard Deviation

#### Q3. Define Range?

**Ans.** Range is the interval between the highest and the lowest scores. It is used when the data are too scattered and the knowledge of total data spread is required. If the highest score is 159 and the lowest score is 58, the range is 101.

The range has the advantage of being a simple, easily obtainable measure of variability. But it has the disadvantage of giving relatively little information about the variability of the numbers between extremes.

#### Q4. Define Quartile Deviation?

**Ans.** The Quartile Deviation is also known as Semi – Inter Quartile Range of the scores are arranged in rank or order of merit half the differences in scores between the third and the first quartile point is called the Quartile Deviation. In other words, we can say that the Quartile Deviation is the half of the distance covered by the middle fifty per cent or half of the cases.

Quartile Deviation can be computed with the help of the following formula.

$$Q.D = \frac{Q_3 - Q_1}{2}$$

**Q6. Define the Terms**

- a. The first quartile
- b. The third quartile

**Ans.a.** The first quartile= The quartiles are the points on the scale of measurement which divide the whole distribution into four equal parts. The first Quartile ( $Q_1$ ) is that in a distribution below which lie 25 per cent of the total number of scores for  $N/4$ . It is also called  $P_{25}$  or 25<sup>th</sup> percentile. It can be computed with the help of the following formula:

$$Q_1 = l + \frac{(N/4 - F) \times i}{F}$$

Whereas:

$l$  = lower limit of the class interval in which  $Q_1$  lies.

$F$  = Total number of cumulative frequencies below the interval in which  $Q_1$  lies.

$f$  = frequency of the interval containing  $Q_1$ .

$i$  = size of the class-interval.

$N$  = number of cases

b. The third quartile : The third quartile is also a point in a distribution below which lie 75 percent of the scores or three-fourth of the total number of scores. It is also denoted as  $P_{75}$  or 75<sup>th</sup> percentile. It can be computed with the help of the following formula:

$$Q_3 = l + \frac{(3N/4 - F) \times i}{f}$$

**Q7. Find the Quartile Deviation of the given grouped data:**

Scores: 120-139, 100-119, 80-99, 60-79, 40-59,

Frequency: 50, 150, 500, 250, 558

Scores	Frequency	Cumulative Frequency
120-139	50	1000
100-119	150	950
<b>80-99</b>	<b>500</b>	<b>800Q</b>
<b>60-79</b>	<b>250</b>	<b>300Q</b>
40-59	50	50

$$Q_1 = L + \frac{[N/4 - F]xi}{f}$$

$$Q_1 = 59.5 + \frac{[250 - 50] \times 20}{250}$$

$$Q_1 = 59.5 + \frac{[200] \times 20}{250}$$

$$Q_1 = 59.5 + 16 = 75.5$$

$$\therefore Q_1 = 75.5$$

$$Q_3 = L + \frac{[3N/4 - F]xi}{f}$$

$$Q_3 = 79.5 + \frac{[750 - 300] \times 20}{500}$$

$$Q_3 = 79.5 + \frac{[450] \times 20}{500}$$

$$Q_3 = 79.5 + 18 = 97.5$$

$$\therefore Q_3 = 97.5$$

$$\text{Now } Q = \frac{Q_3 - Q_1}{2}$$

$$Q = \frac{97.5 - 75.5}{2}$$

$$Q = \frac{22}{2}$$

$$Q = 11$$

### Q8. Calculate the Semi-inter

Quartile Range or Quartile Deviation of the following

Scores: 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13

Frequency: 14, 20, 42, 54, 46, 18, 6

58 for finding Q.D. we have to compute  $Q_1$  and  $Q_3$

Scores	Frequency(f)	Cumulative Frequency(F)
6-7	14	14
7-8	20	34
8-9	42	76 – $Q_1$ falls here
9-10	54	130
10-11	46	176 – $Q_3$ falls here
11-12	18	194
12-13	6	200
I=1	N=200	

$$Q_1 = L + \frac{(N/4 - F)xi}{f}$$

$$= 8 + \frac{(200/4 - 34) \times 1}{42}$$

$$= 8 + \frac{(50 - 34) \times 1}{42}$$

$$\begin{aligned}
&= 8 + \frac{(16) \times 1}{42} \\
&= 8 + \frac{(16)}{42} = 8.38 \\
\therefore Q_1 &= 8.38 \\
Q_3 &= 10 + \frac{(3N/4 - F) \times i}{F} \\
&= 10 + \frac{(150 - 130) \times 1}{46} \\
&= 10 + \frac{(20) \times 1}{46} \\
&= 10 + 44 = 10.44 \\
\therefore Q_3 &= 10.44 \\
\text{Now } Q &= \frac{Q_3 - Q_1}{2} \\
&= \frac{10.44 - 8.38}{2} = 1.03
\end{aligned}$$

**Q11. Define Standard Deviation**

Ans. Standard Deviation is defined as the positive square-root of arithmetic mean of the squared deviation of the scores from the mean”, In other words we can say that standard deviation represents not merely the spread of the distribution but the degree to which the scores are clustered around mean.

**Q12. When and where is Standard Deviation used?**

Ans. Standard Deviation is used:

1. When data is normal
2. When mean is computed as a central tendency.
3. When more accuracy and stability is required.
4. When extreme deviation should exercise a proportionally greater effect upon the variability.

**Q13. What are the steps involved in the computation of Standard Deviation?**

Ans. A. When data is ungrouped:

1. Find out mean (M) of the scores (x)
2. Find out ‘d’ by using formula  $d = (X - M)$
3. Find out squares of deviations ( $d^2$ )
4. Add all the deviations and find  $\sum d^2$
5. Apply formula S.D-  $( ) = \frac{\sum d^2}{N}$

N

Find the standard deviation of the following scores obtained by 10 students in a test of mathematics:

Scores: 18, 25, 35, 40, 15, 17, 8, 12, 45.

SD

Scores of Standards X	Deviation D=(X-M)	Sq. Of Deviation d <sup>2</sup>
18	(18-25)= -7	49
25	(25-25) =0	0
35	(35-25)=10	100
35	(35-25)=10	100
40	(40-25)=15	225
15	(15-25)= -10	100
17	(17-25)= -8	64
8	(8-25) = -17	289
12	(12-25)= -13	169
45	(45-25) =20	400
$\sum X=250$		$\sum d^2 = 1496$

N=10

Mean (M) =  $\sum X/N$

Mean (M)=250/10=25

$$SD \sqrt{\frac{\sum d^2}{N}}$$

$$\sqrt{\frac{1496}{10}}$$

$$\sqrt{149.6} = 12.19$$

Result 12.19

B. When data is grouped

1. Assume any middle point of class interval as assumed mean.
2. Find out 'd' (as we write 'd' is assumed mean method)
3. Find out frequency-deviation product by multiplying each other (fd)
4. Add all fd values and find out  $\sum fd$ .
5. Multiply each fd value with d and find out  $fd^2$
6. Add every  $fd^2$  and find  $\sum fd^2$

7. Apply following formula

$$S.D () \sqrt{\frac{\sum fd^2}{N} - \left(\frac{\sum fd}{N}\right)^2} \times C-I$$

**Q14. Calculate standard deviation from the following data by short method.**

Scores: 195-199, 190-194, 185-189, 180-184, 175-179, 170-174, 165- 169, 160-169, 155-159, 150-154, 145-149, 140-144

Frequency:- 1,2,4,5,8,10,6,4,4,2,3,1

Sd

Scores	Frequency (f)	Deviation (d)	Product of frequency deviation (fd)	Product of Sq. Of deviation and frequency( fd <sup>2</sup> )
195-199	1	5	5	25
190-194	2	4	8	32
185-189	4	3	12	36
180-184	5	2	10	20
175-179	8	1	8	8
170-174	10	0	0	0
165-169	6	-1	-6	6
160-164	4	-2	-8	16
155-159	4	-3	-12	36
150-154	2	-4	-8	32
145-149	3	-5	-15	75
140-144	1	-6	-6	36

$$C.I=5 = N=50 \sum fd=43-55=-12$$

$$\sum fd^2=322$$

$$S.D () = \sqrt{\frac{\sum fd^2}{n} - \left(\frac{\sum fd}{N}\right)^2} \times C.I$$

$$= \sqrt{\frac{322}{50} - \left(-\frac{12}{50}\right)^2} \times 5$$

$$S.D () = 12.63$$

**Q15. Find the S.D. () of the following scores obtained by 5 students in a test of English**

Scores: 6, 8, 10, 12, 14

SD Scores=6,8,10,12,14

$$\therefore \text{Mean} = \frac{6+8+10+12+14}{5} = \frac{50}{5}$$

$$\therefore \text{Mean} = 10$$

Scores X	Deviation =(X-M)	Sq. Of Deviation d <sup>2</sup>
6	(6-10)=-4	16
8	(8-10)=-2	4

10	(10-10)=0	0
12	(12-10)=2	4
14	(14-10)=4	16
N=5		$\sum d^2=40$

$$S.D = \sqrt{\frac{\sum d^2}{N}}$$

$$= \sqrt{\frac{40}{5}} = \sqrt{8} = 2.83$$

### Q1. What is the ‘Mean’?

**Ans.** Mean is popularly known as ‘Arithmetic Mean’. Conveys the meaning of average. It is the representation score of a distribution because all the scores are equally represented in the Mean. A little change in an individual score affects the mean and it gives due weight age to each and every individual score. The arithmetic mean is calculated by adding the individual scores and dividing it by the total number of cases. Mean is designated by the symbol, ‘M’.

In case of ungrouped data, Mean is the sum of measurements divided by the number of cases symbolically.

$$\text{Mean} = \frac{\sum X}{N}$$

Where  $\sum$  = Sum total of  
X = Scores

N = Total number of cases

Example: Compute the Mean from ungrouped scores as given below:

10, 20, 35, 45, 60

$$M = \frac{\sum X}{N} = \frac{10+20+35+45+60}{5}$$

$$= \frac{170}{5}$$

$$= 34$$

### Q2. What is Short Method?

**Ans.** In this method, the class which lies at the middle of the distribution is located. If two class intervals fall at the middle of the distribution, then the class interval will be considered. The midpoint of this class interval is taken as the assumed mean (A.M). ‘O’ is placed against the class interval having the A.M. in the deviation column.

Then +1, +2, +3 etc are placed against the higher scores on the deviation, column and -1, -2, -3 etc are placed against the lower scores. Then the frequencies are multiplied with the respective deviation. The following formula will be applied to get the mean.

$$\text{Mean} = A.M + \frac{\sum fx}{N \times C.i}$$

Where A.M = Assumed mean

N = Number of cases

C = i = class interval

f = frequency

x = x - AM / i

Where the quotient obtained after division of the difference between the mid-value of the class and assume mean by i, the class interval.

### **3. The Median:**

The Median is the point which divides the cases into two equal halves. The cases are arranged either in ascending order or descending order and then the point is located above and below which 50 percentage of the cases lies. It should therefore be understood that the central item itself is not the median. It is only the measure or value of the central item that is known as the median.

For example, if we arrange in ascending or descending order. The marks of 5 students, then marks obtained by the student from either side will be termed as the median of the scores of the group of students under consideration.

### **4. The Mode (MO)**

Mode is defined as the size of a score which occurs most frequently. It is the point on the score scale that corresponds to the maximum frequency of the distribution. In any series, it is the value of the item which is most characteristic or common and is usually repeated the maximum number of times. Computation of Mode for ungrouped data.

Mode can be easily be computed merely by looking at the data. All that one has to do is to find out the score which is repeated maximum number of times.

Example: Suppose we have to find out the value of the mode from the following scores of the students:

25, 29, 24, 25, 27, 25, 28, 25, 29

Here the score 25 is repeated maximum number of times and thus value of the mode in this case is 25.

### **Mode for grouped data:**

When data is available in the form of frequency distribution, the mode is computed from the following data:

Mode (MO) =  $Md - 2M$

### **Q. What is Bar Diagram?**

**Ans.** The bar diagrams are the easiest way of presentation of data in graphic form. This is known as bar-graph. The continuous variable cannot be presented in bar-diagram, only the discrete variables can be presented in it. The bar-diagrams look like the histograms but in case of bar-diagram, there exists a certain gap in between two bars. The highest of bars signifies the difference among the bars. The highest of the bars are proportionate to the respective frequencies, the bars are of equal width on the horizontal axis. The bars can also coloured with different colours or some symbols can also be used to make the bars distinct and clear.

Example:-

In a particular district, there are total 20 educational institutions. First of all it should be presented in a table and then it will be presented in a bar-diagram.

Educational	Frequencies
-------------	-------------

Institution	
Primary school	7
Secondary School	6
Colleges	6
University	1

Total 20

## RELATIVE MEASURES PERCENTILE AND PERCENTILE RANK

### Q1. Explain the meaning of percentile.

**Ans.** Percentiles are the points in the distribution of scores, which have a given percent of the case, falling below it. The total area of frequency distribution is divided into 100 equal parts. Percentiles are linked with percentages, which is equal to 100 points. Percentiles points may be represented by the symbols  $P_0, P_{10}, P_{20}, P_{30}, P_{40}, \dots, P_{100}$ . The percentiles  $P_0$  and  $P_{100}$  are the limits, which include all members of the same distribution.

Formula of Percentile

$$P = L + \frac{(PN - Cfb) \cdot I}{fP}$$

Where

P=Percentage of the distribution

L=Lower limit of class interval, in which desired percentile falls.

PN= Part of N, to be cannot to reach the desired percentile

Cfb= Cumulative frequency below the class interval in which percentile falls

FP= Actual frequencies in the class interval, in which the given percentile falls

I=size of class interval

Computations of Percentile

### Calculate $P_{10}$ calculation of percentile

S.No.	C.I	f	Cum.Freq. C.f	Percentile P
1.	75-79	2	40	$P_{100} = 79.50$
2	70-74	4	38	$P_{90} = 72.00$
3	65-69	6	34	$P_{50} = 67.83$
4.	60-64	10	28	$P_{70} = 64.50$
5.	55-59	8	18	$P_{60} = 62.50$
6.	50-54	6	10	$P_{50} = 60.50$
7.	45-49	4	4	$P_{40} = 58.25$
				$P_{30} = 55.75$
				$P_{20} = 52.83$

				$P_{10} = 49.50$
				$P_0 = 44.50$

Steps:

8. Find out given percent of N i.e. 10.

Percent of 40, which is N in this example

$$PN = P/100 \times N$$

The value of 10 percent is;

$$PN = 1/1 \times 4 = 4$$

9. Locate the value of 4 in cumulative frequency. It falls in the class interval of 45-49. It should be underlined to locate the exact value for substituting it, is the formula.
10. Now, find out other values required for the formula like L=Lower limit of class interval in which 10% of the class fall i.e. 44.5.
11. Cfb=Sum of frequencies below the class interval in which 10% of the class falls i.e. 0, as there is no frequency below class interval 45-49.
12. FP= Actual frequencies against the class interval in which 10% of the class fall i.e. 4
13. I= size of class interval i.e. 5 in this example
14. L=44.5

$$PN = 4$$

$$Cfb = 0$$

$$FP = 4$$

$$I = 5$$

By substituting the values, in the formula, we get

$$P = L + \frac{(PN - Cfb) \times I}{fP}$$

$$P = 44.5 + \frac{(4 - 0) \times 5}{4}$$

$$P = 44.5 + 4/4 \times 5$$

$$P = 44.5 + 1 \times 5$$

$$P = 44.5 + 5$$

$$P = 49.5$$

Percentile Rank

**Q. Explain the meaning of percentile of rank.**

**Ans.** The percentile rank is the position on a scale of 100, to which the subjects score entitle, him. Percentile rank is reverse of percentiles. Percentile rank is the position on a scale of 100, to which any score entitles him. It means if an individual has obtained a

score of 50 in distribution. We have to see what is the position of score of 50 in a frequency distribution. If there are 30% of the scores falling below 50, it means that a score of 50 is above 30% of the class

$$P_{10} = 16.16$$

Formula of Percentile Rank

$$PR = \frac{100}{N} (Cfb + \frac{X - L}{I} \times fP) \quad I$$

In which

PR = Percentile Rank

N = Number of total frequencies

X = Score, for which, PR is to be calculated

Cfb = Number cumulative frequencies below the class interval, in which PR falls

L = Lower limit of the class interval, in which, PR falls.

fP = Actual frequencies of the class interval in which PR falls.

I = Size of class interval.

Calculation of Percentile Rank

Calculate PR<sub>52</sub>

S.No.	C.f	F	C.f
1.	75-79	2	40
2.	70-74	4	38
3.	65-69	6	34
4.	60-64	10	28
5.	55-59	8	18
L=495	50-54	6	10
	45-49	4	4c <b>f</b>

$$N = 40$$

By substituting the values in the formula, we get:

$$N = 40$$

$$Cfb = 4$$

$$X = 52$$

$$L = 49.5$$

$$I = 5$$

$$fP = 6$$

$$\text{Formula: } PR = \frac{100}{N} (Cfb + \frac{X - L}{I} \times fP)$$

I

$$= PR = \frac{100}{40} (4 + \frac{52 - 49.5}{5} \times 6)$$

5

$$= PR = \frac{100}{40} (4 + \frac{2.5}{5} \times 6)$$

5

$$= PR = \frac{100}{40} (4 + \frac{3.0}{5})$$

5

$$= PR = 2.5(7)$$

$$= PR = 2.5 \times 7 = 17.5$$

$$= Pr = 17.5 \text{ or } 18$$

Hence PR = 17.5 or 18

## Q. Bivariate Correlation

**Ans.** When distribution is not normal or when the shape of the distribution is not known, there is a need for a measure of correlation that involves no assumptions about the parameters of the population.

There are ways to avoid making any assumption by ranking the score, according to the size and making further computations on ranks rather than on original scores. When ranks are used in place of actual observations or sometimes when the number of observation is small and parametric assumptions are not met, the data is reduced to ranks (original) to get a coefficient or rank correlation as denoted by  $P$  (read as Rho) instead of  $r$ . It is also known as Spearman's  $P$ , called Spearman's Rho.

Spearman's co-efficient of correlation ( $P$ ) is determined with the help of the formula given below:

$$P = 1 - \frac{6\sum D^2}{N(N^2-1)}$$

Example: Calculation of co-efficient of rank correlation between marks obtained by 10 students in two subjects Maths and Physics.

S.No.	1 Marks in Maths	2 Marks in Physics	3 $R_1$	4 $R_2$	5 $D$	6 $D_2$
1.	10	8	10	9	1	1
2.	11	9	9	8	1	1
3.	13	7	8	10	-2	4
4.	15	10	7	7	0	0
5.	16	14	6	4	2	4
6.	17	15	5	3	2	4
7.	18	16	4	2	2	4
8.	20	11	3	6	-3	9
9.	21	13	2	5	-3	9
10.	22	17	1	1	0	0
=10					+8 -8 $\sum D=0$	$\sum d^2=36$

Here in the example

$$\sum d^2 = 36$$

$$N = 10$$

$$\begin{aligned} \text{Formula} &= P = 1 - \frac{\sum D^2}{N(N^2-1)} \\ &= 1 - \frac{36}{10(100-1)} \\ &= 1 - \frac{36}{990} \\ &= 1 - \frac{216}{990} \end{aligned}$$

$$= 1-.218$$

$$= 1 - .218 \text{ or } P=1-(0.22)$$

$$=0.782 \text{ or } P=78$$

The value of coefficient of correlation comes out to be 0.782 or +0.78. It shows there is a very high positive co-efficient of correlation between the marks of the students in the subjects of Maths and Physics. In other words, the performance of the students in Physics and Maths is highly related to each other.

**Q. Pearson’s Product Moment Method of Correlation**

**Ans.** Product moment method was developed by Karl Pearson. It is denoted as T. The value of T may be regarded as an arithmetic mean of standard scores.

$$r = \frac{\sum xy}{\sum x^2 \sum y^2}$$

Where r=Co-efficient of correlation  
 X=deviation of x scores from the mean (X-M)  
 Y=deviation of ‘y’ scores from the mean (Y-M)  
 c.  $R = \frac{N \sum (xy) - (\sum x)(\sum y)}{(N \sum x^2 - (\sum x)^2)(N \sum y^2 - (\sum y)^2)}$

$$(N \sum x^2 - (\sum x)^2)(N \sum y^2 - (\sum y)^2)$$

Where r= coefficient of correlation  
 X=scores in the x column  
 Y=scores in the y column  
 N=number of cases

Students	X	Y	X (x-m)	Y (y-m)	Xy	X <sup>2</sup>	Y <sup>2</sup>
A	15	60	-10	10	100	100	100
B	25	70	0	20	0	0	400
C	20	40	-5	-10	50	25	100
D	30	50	5	0	0	25	0
E	35	30	10	-2	-200	100	400

$$\sum x=125 \quad \sum y=250 \quad \sum xy=250 \quad \sum x^2=250 \quad \sum y^2=1000$$

Mean of x = 125/5=25  
 Mean of y = 250/5=50  
 $=r = \frac{\sum xy}{\sum x^2 \sum y^2}$   
 $=r = \frac{250}{250 \times 1000}$   
 $=r = \frac{250}{250.000}$   
 $=r = \frac{250}{500}$   
 r= -0.5

Product moment correlation  
 Coefficient=0.5

**T-TEST**

T test for correlated Means less than 30

Null hypothesis, there is no difference between boys and girls.

Boys (Group I)	Girls (Group 2)
N=20	N=20
SD=7.4	SD=6.5
X=53.20	X=49.80

We select group I by taking highest mean) and lowest mean for group two

$$\begin{aligned}
 &= \frac{x_1 - x_2}{\sqrt{\frac{SD_1^2}{N_1} + \frac{SD_2^2}{N_2}}} \\
 &= \frac{38 - 32}{\sqrt{\frac{(2.4)^2}{41} + \frac{(51.2)^2}{38}}} \\
 &= \frac{6}{\sqrt{\frac{(88.36)}{41} + \frac{(2404)}{38}}} \\
 &= \frac{6}{\sqrt{(2.15) + (0.71)}} \\
 &= \frac{6}{\sqrt{(2.86)}} \\
 &= \frac{6}{1.89} = 3.5
 \end{aligned}$$

Df= DEGREE OF FREEDOM

