CHAPTER I

INTRODUCTION
INTRODUCTION

Sport touches the lives of different people in different ways. It is pervasive in the sense that it spreads throughout society. In only rare instances does one aspect or another of sport not appeal to almost everyone. Says Stone (1969), "If a man in our society does not have a least some conversational knowledge of sports, he's viewed as suspect."

Charles A. Bucher (1975) states, "Games and Sports are a popular pastime for young and old, for boys and girls and for men and women. They offer opportunity for all to obtain exercise, fun and relaxation. They can play an important part in developing physical fitness and skill for use in leisure time, now and perhaps more important in later years. Many of the skills developed through games and sports may be used in years to come to help keep physically fit."

By nature human beings are competitive and ambitious for the excellence in all athletic performances. Not only every man but every nation wants to show its supremacy by challenging the other nation. Thus, this challenge stimulates, inspires and motivates the men and
women to sweat and strive to run faster, jump higher, throw farther and exhibit greater strength, endurance and skills in present competitive sports world. This can only be possible through scientific, systematic and planned sports training as well as channelling them into appropriate games and sports by finding out their potentialities. Because of scientific and technological advancements, the present period is regarded as a period of specialisation in the field. The subdisciplines in the field like biomechanics, growth and development, health education, motor learning, neuro-physiology, physiology of exercise (cardiorespiratory) physiology of exercise (Strength and endurance) become more and more specialised. Mrs. Indira Gandhi said, "Technology covers every aspect of life and sports are no exception to it. Sports Science has enabled modern youth to develop physical capacities beyond imagination. Sports have become highly competitive and existing records are being broken and bettered with greater rapidity."

For a good performance in any sport or athletic event, achievement of a high standard of fitness is a basic requirement. Mere participation in sports activity is not enough to improve fitness. The fitness must be gained through conditioning programmes.
John T. Powell (1972) says, "Fitness is not end, it is beginning. A person must get fit to perform and will not necessarily get fit by performing ... Fitness is not matter of physical capacity alone. Man is a unit, training can make a person physically fit. But one should be interested in total fitness (including the realms of mental, moral, social emotional as well as physical fitness) when aiming some one reach his potential." Since the days of early Greeks, physical fitness has been an important objective of sports. In fact, the desire to establish a scientific approach to the development of physical fitness was the primary objective. Yet, despite the long-standing concern for physical fitness and the vast amount of research on the subject, there is evidently considerable difference of opinion within the profession as to which elements constitute physical fitness.

1.01 CONCEPT OF FITNESS

M. Barrett (1974) maintains that: "Evidence is mounting that physically fit persons lead longer lives, have better performance records, and participate more fully in life than those who are unfit."

The following analysis of fitness will set out to determine the justification of this statement by
defining fitness; by including a wide range of categories and determinants; by showing how the physical side of fitness can be measured; and ultimately showing how beneficial regular physical activity is to the creation of a 'whole' man.

The American Association of Health, Physical Education and Recreation (1967) defines fitness as: "... that state which characterises the degree to which a person is able to function efficiently. Fitness is an individual matter. It implies the ability of each person to live most effectively within his potentialities. Ability to function depends upon the physical, mental, emotional, social, moral and spiritual components of fitness, all of which are related to each other and are mutually interdependent.

Quite often people think only of physical fitness when the term 'fitness' is used, but this encompasses only a part of person's make-up. The above definition implies that one should view physical fitness as only a part of total fitness. Jones et al. (1972) states: "A totally fit individual has strength, speed agility, endurance and social and emotional adjustments appropriate to his age." The phrase "... appropriate to his age, emphasises another important aspect when determining
Fitness. Fitness, particularly physical fitness, is an individual matter and as it only has meaning when it is viewed in relating to the specific needs of each individual. Each individual has to decide for himself—what these needs are in relation to several criteria e.g. his age, occupation and particular activity in which he is participating.

Whatever an individual's requirements, he can be said to have achieved level of optimum fitness if, according to Clark (1967), he has: "... the ability to carry out daily tasks with vigour and alertness, without undue fatigue, and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies." Clark (1968) further indicates: "...physical fitness is the ability to last, to bear up and to persevere under difficult circumstances where an unfit person would give up. It is opposite to being fatigued from ordinary efforts, to lacking the energy to enter zestfully into life's activities, and to becoming exhausted from unexpected, demanding physical exertion."

Barrow and McGee (1979) put forward that "physical fitness is that state which characterises the degree to which the person is able to function. It is an individual
Dick, Frank W. (1980) opined, "Fitness may be defined as the successful adaptation of one's life style. A scientifically based and systematic training programme is fundamental to the athlete's fitness. Training provides the athlete with the basic means to adapt to his particular stresses through controlled exercise. Training theory may supplement the Coach's practical knowledge to help him formulate a balanced training programme."

From the above definitions, it is clear that fitness is a relative term. A person is considered to be fit for a particular task or activity when he can accomplish it with a reasonable degree of efficiency, without undue fatigue and recovery from the effects of exertion.

1.02 GENERAL AND SPECIFIC PHYSICAL FITNESS

The physical fitness may be classified as general physical fitness and specific physical fitness. The general fitness is the pre-requisite for all the sports, which include strength, speed, endurance, agility, flexibility and balance whereas specific fitness varies from sport to sport. In certain sports the strength component of fitness is a dominating factor whereas in other sports endurance, speed and agility may be required for achieving better results.
If one wishes to put the two concepts in their proper place, one must conclude that general fitness is a physical condition of a higher order than average. This issue of generality and specificity is highlighted by the work of Franklin Henry and others on specificity and by Flishman and others on factor analysis. Henry, has summarised on the basis of evidence presented by Cozens (1929), Seashore, Buxton and McCollom (1940), Rarich (1937) and Cumbee (1954) that "... it is no longer possible to justify the concept of unitary abilities such as strength, endurance, co-ordination and agility, since the evidence shows that these abilities are specific to a particular task or activity."

This position of specificity implies that the performance of an individual in one type of physical activity gives but a slight indication of the rank he will hold in the performance of another task. As Henry (1956) has stated: "... it must be conceded that co-ordinations are highly specific - it is largely a matter of chance whether an individual who is highly coordinated in one type of performance will be poorly coordinated in another."

In past years, studies such as by Smith (1961) and Lottor (1961) have further substantiated the hypothesis that individual differences in motor coordination abilities are highly specific to the act under consideration.
According to Hardayal (1984) "Each sports activity demands different types and levels of different motor abilities and when a sportsman possesses these, he is said to have the specific physical fitness. It is this specific fitness which makes it possible for a player to perform unusual and extraordinary movements, and to do so at a very high standard of efficiency. It is also termed as performance fitness."

According to Berger (1973) "Conditioning for the player in the sport of soccer is different from what is needed to optimise performance in cross country running, basketball etc., although the same physiological mechanisms are involved in these activities. The large difference in these sports is the way in which these physiological mechanisms are involved in these activities and also the way in which these physiological mechanisms are stressed in competition."

Athletes face different types of physical stresses based upon the nature of the concerned activity e.g. a wrestler, a weight lifter, a boxer and a soccer player needs more strength than a long distance runner or a sprinter does. Still, strength is the requirement of both the wrestler and the soccer player but, predominantly, in the arms of the wrestler and the legs of the soccer player. Similarly, endurance achieved through swimming
may hardly be found useful in achieving good results in the game of basketball.

The demands of each sport are diverse. The meaning of athletics is specific to a given athlete. The athlete seeks to develop a fitness specific to the demands of his sport. Keeping in view this fact, a number of physical educationists and scientists have laid emphasis on the principle of specificity of sports.

Katch and Katch (1981) devised a principle of specificity in training for anaerobic and aerobic power which is referred to adaptation in the metabolic and physiological systems, depending on the type of over load imposed. Based on their latest research, they have advised that training for specific aerobic activities like cycling, swimming, rowing or running, the over load must engage the appropriate muscle required for the activities as well as provide exercise stress for the cardiovascular system. There is little improvement noted when aerobic capacity is measured by a dissimilar exercise.

Arther Jones (1977) mentioned that only possible way to produce specificity in anything is by performing the act itself with the same tool in exactly the same manner. Strength in general contributes to any activity but the applied demonstration of strength is specific.
James E. Councilman (1976) expressing the specificity of training referred that when a person runs only a cross country he develops only endurance and not speed. A bodybuilder who works with heavy resistance and few repetitions develops big muscles only. He explains that to develop speed of muscle contraction the exercise must be performed at high speed. This concept conforms to the specificity of the training principle. It is a mis-conceived notion that strong muscles will have faster speed.

According to Elington and Edgerton (1976) "The concept of specificity of training is that an individual who trains for only one specific event will be superior in that event to another individual who trains simultaneously for a series of events. They put forth the theory of physical training for athletes based on the concept of specificity of exercise. They have suggested that in establishing training methods, a person must emphasise training, which optimally adopts the specific factors involved in the activity. The exercise task must be specific to the training goal."

Stone and Johnson Carter (1979) found that with vertical jump free weight group increased significantly when compared to the nautilus group and this difference
was because of specificity of training. They further explained that specificity of training concept is made up of various components including specificity of velocity. Slow movements may be neurologically different from fast movements even when, mechanically, they are same. The neurological difference may be attributed to the firing patterns and number and types of muscle fibres activated.

Kris Berg (1978) suggested that conditioning should be specific for the event. Requirements of strength, speed, anaerobic and aerobic capacity differ for each event. The proportion of training time should vary in accordance with the demands of the event.

Gene Hooks (1962) suggested different weight training programmes to different sports like Basketball, baseball, football, swimming and track and field events etc. considering their different requirements of fitness.

Nelson and Johnson (1983) found that because of specificity of practice factor, competitive gymnasts were different from other gymnasts. The competitive gymnasts were more flexible, more slender, weightless and were stronger than the recreation and physical endurance gymnasts.
ASPECTS OF SPECIFIC FITNESS

State of fitness for the play is dependent upon the suitability of his body structure for the work to be performed, the effectiveness with which his organs and systems support the effort, and the view that the player takes of the task as he approaches it and carries it through to completion.

SPECIFIC ANATOMICAL FITNESS

The player must possess all of the body parts necessary to the performance of the task and at the same time he must have appropriate shape and size of the body for a particular game. In a game like basketball the height of the player is a basic requirement. Soccer is such a game as can accommodate players of various shapes and sizes but this is quite acceptable up to a point for the recreational player who has no higher aspirations. For them their requirements may never need modification. But at higher levels, even though there is a variety of players from the anatomical standpoint, it is more likely that specific anatomical qualities will be necessary for player to achieve success at these levels of play.

Genetic imperfections in organs and tissues are responsible for weakness in structure and function. These
limit the individual's capacity for strength, endurance and skill.

Morehouse and Miller (1971) viewed that "slight individual differences in the points of attachment of tendons to bones and differences in length of bones result in different mechanical leverage advantages or disadvantages for various events. Thus one player is fit for weight lifting, another for sprint running, and another for jumping. If a person enters a competition for which he is anatomically unfit, he does so with a distinct disadvantage compared to his opponents who possess anatomical features more fit to the event."

SPECIFIC PHYSIOLOGICAL FITNESS

For the specific physiological systems of the body to be fit they must function well enough to support the particular game that the player is playing. Since different games make different demands upon the organism with respect to neurological, respiratory, circulatory, metabolic and temperature-regulating functions, physiological fitness is specific to the activity. Physiological systems are highly adaptable to exercise. The response of each system is discrete; hard work in the heat is necessary to improve the fitness of the temperature-regulation mechanism. Each task has its
major physiological components, and fitness for the task requires effective functioning of appropriate systems.

SPECIFIC PSYCHOLOGICAL FITNESS

A player is psychologically fit for the game if he possesses the required perceptions, emotional stability, motivation, intelligence and educability to accomplish the task. By creating tension, elevated heart rate and blood pressure, and endocrine disturbances anxiety can become barrier to performance. This adds to the stress of the task and therefore, contributes to the player's unfitness for it. No player is without anxieties, but some are better able to adapt to the stress of anxiety in their lives and these players are more psychologically fit for arduous work.

1.04 HISTORICAL BACKGROUND OF SOCCER, ANALYSIS OF THE GAME AND SPECIFIC PHYSICAL FITNESS REQUIREMENTS OF THE SOCCER PLAYER

Soccer is the most popular sport in the world at present. It is apparently one of the ancient sports and it is the direct ancestor of American Football, Canadian Football, Rugby and several other similar sports. Soccer can be traced directly to eleventh century in England but its antecedents may well be much older than that. In many pagan religious ceremonies, perhaps as
long as 4,000 years ago, the head of puppet representing the God of darkness was the ball in a kind of field hockey contest. Early football game in England was associated with religious ceremonies. In 1603 when James I became king, people were urged to play football and thus football flourished throughout the British Isles. Every region, perhaps every town and country had its own set of rules, but one feature remained remarkably constant and that is the hands and arms cannot be used to advance the ball. After the invention of Rugby there was an increasing confusion about which sport was meant by "Football" but in 1863 the London Football Association was formed and it voted to stick to the old system of play. That form of Football was known as 'Association Football' abbreviated 'Assoc.Football'. Eventually at last the abbreviation game away to Soccer Football or Soccer. Thus it was distinguished from Rugby Football. (New Encyclopaedia of Sports,1977).

According to J.P. Thomas (1964) "Soccer is a game which calls for strenuous, continuous, thrilling action and therefore, appeals to youth all over the world. The basic neuromuscular co-ordinations are better developed, hence there is vital necessity to teach the game on scientific lines."
According to Hubert Vogelsinger (1970) "The growing sophistication of soccer has placed proportionately great demands upon the player and coach. Development of each player's power, speed, general condition enable him to sustain a high work rate throughout the game or even to accelerate it when necessary. One is aware of the fact that the body adapts more readily to sustain stress at regular intervals than to irregular stress at sporadic intervals. The stress in soccer occurs at irregular intervals and varies in intensity."

Many studies in the European countries have determined the stress and work loads of soccer players. The analysis of the player's work load is essential. These statistics are vital. Since the stress in soccer appears at irregular intervals and in varied intensities, one has to analyse the soccer player's work load in certain intervals of play. Here this interval is of two minutes.

Hubert Vogelsinger (1970) conducted a study and analysed that in the play of two minutes, the defender would have:

15 seconds stress - In 15 seconds stress, the player attempts 20 yards running to meet the ball or tackle, after successful tackle ball is passed over 20 yards.
15 seconds interval - During this period, while anticipating and evaluating the playing situation the player takes passive rest.

30 seconds stress - The player takes 15 yards sprint in order to tackle and after the successful tackle, the player takes 25 yards running with the ball and later on gives pass over 20 yards.

1 minute interval - During this interval the player takes active rest while jogging to get a ball. He takes a short pass under 10 yards, and adjusts his position by 10 yards front jogging and similarly 10 yards diagonally backward jogging.

A midfield player's game for two minutes play analysed as follows:-

45 seconds stress - The player takes 8 yards sprint and receives a pass and then takes a short pass under 10 yards. Again he takes 5 yards sprint and receives a pass and gives a short pass of about 10 yards. Later on he takes another sprint in order to tackle until there is unsuccessful tackle.

30 seconds interval - The player takes active rest while anticipating play and takes 10 yards jogging to come into his position.
45 seconds stress - The player takes about 10 yards sprint in order to tackle, and after successful tackle there is 40 yards running with the ball before passing over the ball over 20 yards. Again he takes 10 yards sprint to have suitable position. Later on he undergoes 40 yards running to take his previous position.

An Attacker during this play of two minutes would have:

30 seconds stress - Attacker takes 5 yards sprint to receive the ball. Either he gives a short pass under 10 yards or has 10 yards sprint to shot at goal.

15 seconds interval - During this interval the player takes active rest and has 30 yards jogging to come back to his position.

45 seconds stress - The player takes 5 yards sprint and receives a ball and has 10 yards running with the ball and dribbles the ball to avoid tackle and later on gives under 10 yards pass.

30 seconds interval - The player takes active rest which carries 30 yards jogging to come back to his position.

Soccer is not played on the ground alone. Often ball remains in the air. In a game ball is sent 500
times above the head level therefore, player's ability of jumping, heading and controlling the ball is of vital importance while the ball is in the air.

Players must be conditioned for maximum stress so that during the emergencies they are able to use their reserves. Otherwise fatigue will make their game dull.

Endurance and speed endurance are of vital importance. Usually in a soccer game, player covers a distance of 5,500 yards which include running - 1500 yards, sprinting - 1000 yards, jogging - 3000 yards.

Although most of running in soccer is straight but these runs are frequently broken by a quick turn to dodge an opponent, a jump to head the ball, stop and go, or acceleration from stationary position.

Most all out or nearly all out runs are made without the ball under control, although ball contact may precede the initial run or occur during or at the end of a run, since most sprinting in a game involves attacking the ball.

If the total distance of sprinting, jogging and walking is to be broken down, it must be into typical distance of 10 yards sprinting, 20 yards jogging and
30 yards walking.

Periods of rest also occur at irregular intervals and irregular duration but they are seldom completely passive which carry change of position through jogging or walking or mentally following or anticipating the play. The player must be able to withstand stress over a long period of time.

During the past few years the game of soccer has adopted new style and technique in its play. Various offensive patrons and systems have been employed. It was a time when forwards were required to have offensive duty and the defence players were performing the duty of decence. Under the modern pattern every member of the team plays its role in starting and sustaining the attack while sometimes back defensive players - like full backs were specially instructed not to cross the midline of the field. Their sole aim was to defend their own goal. It was realized that when the goal area was under attack, the forwards of the defending team were out of the play and were of no utility, when actually their help was needed to a great extent. When the wings and inside forwards were dropped back, the defence of the team got double strength. This continuous pressure and harassment disrupted an opposing team and resulted in inaccurate passes and shots.
The old style and pattern finds very little place in the modern and latest theory of all out play. In the present style of play all the players are needed at each and every position. All players are sharing the responsibility of both offence and defence. In order to follow the latest style and pattern of the play, great preparations are required. Therefore, the player must be in excellent physical condition specifically trained to continue the pace for an entire match.

Whatever the duration of a soccer game, the players involved must be able to give their best during the entire game. Soccer demands that the player be in peak physical condition if he hopes to perform skills to the best of his ability. According to Wieren Van Gleen (1978) "Soccer has developed into a highly competitive sports which requires a high level of fitness." Donald K. Mathews in his letter dated Dec. 9, 1983 to Dr. N.N. Mall, Panjab University describing the fitness requirements of Soccer has mentioned:

"Certainly Soccer which is almost constant, high intensity running would be classified as really 100% aerobic activity. However the full backs should receive short distant high intensity work outs such as interval of 30 to 40 metres as this position requires anaerobic conditioning."
If the statement of K. Mathew as given in the above para is analysed, it would be more appropriate to say that Soccer in general needs both, aerobic and anaerobic fitness, which is little different to the general aerobic fitness. It is the activity of long distance running with high intensity for forward players and short distance bursts of very high intensity for defensive players which may be considered as agile anaerobic fitness, since he has to defend a very limited goal mouth area of total soccer field and his movements are just like a panther which needs a high order of explosive strength inclusive of agility and reaction time.

We have some idea of the requirements of the game soccer and the specific work demands of the player. Most physical characteristics are inherited or established well before a coach can exert his influence, e.g. height, size, etc. Many of the physiological ones may be modified through training.

Specific physical fitness can be broken down into components all of which are necessary to the total fitness of the soccer player. Every player will have a minimum level for each of these components, though few will have developed each one to its full potential. It is the task of the each aspiring soccer player to
examine these requirements, to assess the strength and weaknesses and to correct and improve them were necessary.

Any observation of total fitness should focus on the question, "Fitness for what?" Therefore, training for fitness must relate specifically to one activity or game i.e. soccer. Our intention is to examine specific physical fitness purely from the physiological aspect. Hence our concern is with the demands of the soccer game.

Based upon the above explanations, any human performance can be viewed as the expression of a number of components called performance factors and in which there are inherent specific factors. These factors are so complex and inclusive as to be unwieldy and almost undefinable. Any performance might be formally or informally analyzed to determine its components in terms of general or specific factors. Once these are identified, developed or training programme can be formulated, applied to the athletes and later its influence can be sought to be evaluated on the scientific test scores.

1.05 TESTING OF SPECIFIC FITNESS

Once the components of specific fitness have been
identified one must know how to measure them. It is obvious that any evaluation of training will depend on the measure of progress shown from one level of fitness to another. For that reason it is sensible to measure the level of fitness prior to the training programme.

The most effective method of evaluating the effects of training is by performance in play. Ultimately this is what really matters. Playing performance, however, is sometime difficult to measure, for it is influenced by many other factors such as personal skills, level and the ability of the opponent. In view of this it is helpful to have an indication of level of fitness which are independent of the game. It is also necessary to isolate each component and to establish the player's relative strength and weaknesses and check if training has changed it. Unless all the specific considerations with the physical fitness of a soccer player are not viewed in a test, it cannot retain its label as an evaluator of specific physical fitness of a soccer player. While number of physical educationists and scientists have laid emphasis on the principle of specificity of sports, fitness testing methods and techniques have been still traditional.

If a soccer player can see himself improving physically, it is a great psychological and physiological boost. In order to measure and to evaluate or test the
specific type of physical fitness of soccer player, there is a basic requirement of specifically designed physical fitness tests instead of general physical fitness tests. At present very little attention has been paid to it.

1.06 STATEMENT OF THE PROBLEM

Modern era is an era of competition and sports are becoming highly competitive with scientific and specialised foundations in connection with the potentialities of the player.

The present investigator wishes to construct specific physical fitness tests specifically for the soccer players. The researcher has undertaken the project entitled:

"SPECIFIC PHYSICAL FITNESS TESTS FOR SOCCER PLAYERS"

1.07 OBJECTIVES OF THE STUDY

The project "SPECIFIC PHYSICAL FITNESS TESTS FOR SOCCER PLAYERS" can deal with immediate objectives and the progress of soccer players towards certain goals.

i) To develop specific physical fitness tests which help the soccer player to test and measure
the status and capacities of individuals in terms of the stated specific physical fitness.

ii) To provide data for diagnosing specific fitness tests such as strength, speed, endurance, agility, flexibility cardiovascular endurance for soccer players.

iii) To evaluate specific physical fitness of soccer players with the help of norms.

1.08 DEFINITION AND EXPLANATION OF SELECTED TERMS:

SOCCER

Soccer is a football game, played under teams of eleven players on a side, using a round football. The designation 'Soccer' is derived from 'Association Football' to distinguish from American Football, Canadian Football, Rugby and several other sports in the historical development of the game. It is now played under the rules of the Federation International De Football Association. (New Encyclopedia of Sports, 1977).

Narottam Puri (1979) says, Charles W. Brown of England is believed to have invented the word "Soccer."

Soccer can be defined as a team game played
PHYSICAL FITNESS:

H. Harrison Clarke (1979) opined, "Physical fitness is the ability to carry out daily tasks with vigour and alertness, without undue fatigue and with ample energy to engage in leisure time pursuits and to meet the above average physical stresses encountered in emergency situations."

SPECIFIC PHYSICAL FITNESS

"The Specific physical fitness refers to the adaptation of physiological and muscular systems of the body to the stresses caused by the specific activity or physical exertion."

For the purpose of this study specific physical fitness means:

"Specific physical fitness is a complex term consisting of at least seven separate factors. Further more, the term "Specific physical fitness for soccer players may be defined by isolated factors. These factors are:

1) Leg explosiveness and Trunk Flexibility.
2) Change of direction."
(3) Leg reach
(4) Speed acceleration.
(5) Arm strength
(6) Soccer aerobic endurance
(7) Growth factor age.

TEST:

A test defined by Philips and Hornak (1979) is a tool or instrument of measurement that is used to obtain data about a specific trait or characteristic of an individual or group.

Charles A. Bucher (1983) says, "Test is an instrument that is used to gain information about objects or individual."

Earle F. Zeigler (1982) mentioned, "A test is the instrument used to assess a variable."

Johnson and Nelson (1982) have defined test, "as a form of questioning and/or measuring used to assess retention of knowledge and capacity or to measure ability in some physical endeavour."

For the purpose of this study 'test' would mean a 'specific physical fitness test' in the form of an instrument to assess the specific physical fitness ability of the participants.
FACTOR ANALYSIS

Richard M. Jaeger says, "Factor Analysis is a statistical procedure that is used to reduce a large number of variables to a much smaller, representative set of variables, called "factors". The object of factor analysis is to achieve parsimony, and often to discover the essential variables that underlie and summarize the information in a large set of variables."

CARDIOVASCULAR ENDURANCE:

Philips and Hornak (1976) says Cardio-respiratory endurance is the ability of the circulatory and respiratory system to adjust the vigorous exercise and to recover from the effect of exercise.

SPEED

Robert V. Hockey (1973) observed that speed is the quickness with which one is able to move his body from one point to another.

Barrow and Mc Gee indicated, "Speed may be defined as the capacity of the individual to perform successive movement of the same pattern at the fast rate."

Chowdhury and Sinha (1974) opine that speed is the rate of change of position of body and speed in a
particular direction is called velocity." For purpose of this study 'Speed' would mean "The ability to run fast, although essential for top play. It may be as critical as the ability to accelerate quickly. The soccer player has to change direction or start from a stationary position so often that the ability to reach high speed over a few strides may be more important than a general ability to run quickly."

AGILITY:

Johnson and Nelson (1969) mentioned, "Agility is the physical ability which enables an individual to rapidly change body position and direction in a precise manner."

Meyers R. Carlton (1962) call it the ability to change both rapidly and accurately the position or direction of the body through large range of movement.

Phillips and Hornak (1979) define it as the ability to change direction rapidly and accurately. It depends essentially on strength, speed of reaction and movement and big muscle co-ordination. The above listed definitions refer to the agility which is one of the component of general fitness. The soccer agility is slightly deviated from the above concept which refers to
specific nature of agility involved in soccer game. It is mostly related with the change of directions accompanied by dodge running.

**FLEXIBILITY:**

Johnson and Nelson (1978) have opined that Flexibility is the ability of an individual to move the body and its part through as wide a range of motion as possible without under strain to the articulation and muscle attachment.

Robert V. Hockey (1973) pointed out, "Flexibility may be defined as the functional capacity of the joints to move through a full range of movement."

Barrow and Mc Gee (1971) indicated: "Flexibility may be defined as the range for movement in a joint."

Hardayal Singh (1984) says that Flexibility is the ability to execute movement with greater amplitude.

For the present study flexibility means "The ability to move the trunk and limbs through a wide range of position. A flexible player has an advantage over the less flexible player, for the ability to return a ball when caught off balance or at full stretch depends on good flexibility."
RELIABILITY:

Meyers R. Carlton (1962) pointed out "Reliability as the extent to which a test is consistent in measuring what it measures, it is usually estimated by some form of reliability co-efficient or by the standard error of measurement."

VALIDITY:

Meyers R. Carlton (1962) mentioned it as the extent to which a test measures what it is intended to measure, specific to the purpose for which the test is used i.e. specific physical fitness.

OBJECTIVITY:

Objectivity, according to Meyers R. Carlton (1962) is "The extent to which a test is consistent in measuring what it measures when administered by different individuals.

NORMS:

Meyers R. Carlton (1962) indicated that norms are summarised statistics that describe the test performance of specified groups such as pupil of various ages or grades in the standardization for the test. Norms are descriptive of average, typical or mediocre performance and do not constitute standards or desirable levels of attainment grade, age, T. score and percentile are the
The most common types of norms.

1.09 DELIMITATION:

i) The study was delimited to the male soccer players at the University representing level between the age group of 18-25 years.

ii) The sample of the test scores have been collected from the Northern region only which includes the Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir, Delhi and some parts of the Uttar Pradesh.

iii) The norms for the evaluation of specific physical fitness status of soccer players have been developed on the Northern region population only.

1.10 SIGNIFICANCE OF THE STUDY:

i) The study has developed specific physical fitness tests for soccer players, which has provided a modern and scientific base in the field of measurement and evaluation in general and to the soccer players in specific.

ii) The study would provide guideline to the physical education teachers, coaches to develop specific physical fitness conditioning programme for the soccer players.
iii) The study would serve as the motivational force to the soccer players to improve their specific physical fitness.

iv) The study would help to identify low and high fit soccer players and would help to locate potential players.

v) The use of test would help the coaches, physical education teachers to evaluate the effectiveness of their specific conditioning programme.

vi) The study would yield norms to be used for the evaluation of selection of players for different levels of competition.

---