

## CHAPTER I

### INTRODUCTION

Sports are no longer just sports and games. They are business all over the world. The boom in prize money and the practice of internationally renowned sportsman signing on the dotted line to endorse the products has made sports, big business. Sports lovers all over the world are happy that reputed sportsmen are no longer obliged to follow a regime of high thinking and low living.

Today, sports have become a part and parcel of our culture. It is being influenced and does influence all our social institutions including education, economics, arts, politics, law, mass communication and even international diplomacy. In fact its scope is awesome. They attract the masses either for recreation or physical fitness or as a full time profession. The world is so advanced that Science dominates every aspect of life, sports is not an exception to it. Technology has forever changed our world, and in the process significantly increased the importance measuring and controlling performance relevant to physical, physiological and anthropometrical parameters.

Football is the most popular sport in the world, All over the globe people are attached to this game in deep and passionate cultural way soccer or football, as it called most there is just something soccer of which over the year has earned nick names including the beautiful game the simplest, the world's game and peoples game **(Robert,2010)**.

Football played at a professional level all over the world. Millions of people regularly go to football stadium follow their favorite teams, while billion man watch the game on television, A very large number of people also play at an amateur (Vijay Asthna,2009) football is a popular game of physical and mental challenges, At least 200 millions licensed players participate in football games are arranged each year in the world football is a team game the object of which is advance an inflated round ball towards the opponents goal post by kicking , passing , dribbling and playing with any part of the body except arms (Witurorw, 2003).

Playing any sports offers the opportunity for players to develop qualities that will help them as they strive for excellence in their lives, but sport where an individual can truly grow and develop it is the sports that demand it's the players take on a lot of responsibility for what happens in the game ,there are no time outs .the game runs .much responsibility for terms success excellence rests with each individual players (Roberts ,2010 )

### **1.1 HISTORY OF FOOTBALL**

The Contemporary history of football spans more 100 years . All began in 1863 in England. When rugby football and association football in branched of different courses and the world's first football association was founded (football association). Both forms of football stemmed from a common root and both have along and, intricately branched ancestral tree the spread of football outside of great Britain mainly due to the Britain influence aboard started slow, but it soon gathered. Momentum and spread rapidly do all parts of the world (Subhash k.goyal, 2009).

In 1863 when a group of players and manager from English public schools get together in London and wrote a set of rules for the sports and they Call it as football which is how most of the world refers to it federation international de football association was founded in 1904 and based in zuinich federation and international football association administers and markets all worldwide soccer competitions including the world cup overseas all changes to the rules of the game. The international football play community grows steadily, although it sometime met obstacle and set back. In 1912 twenty one national associations were already affiliated to the federation international football association. By 1925 the number had increased to thirty six the federation international football association boasts more countries among it membership then the United Nations. No other sports have so many passionate players and fans **(Robert, 2010)**.

During the colonial rule the British introduced the game of football in India and rapidly and the fancy of the native masses. Football is one of the most popular game in India. The game commands a massive fan flowing across the length and breadth of the country. But of lane football has lost out trios more illustrious cousin cricket. In the popularity stakes. During the colonial rule the British they introduced the game football in India and it rapidly caught the fancy of the native masses . The game found a strong foot holds in Bengal with the mohunbagan club coming up in 1889. The Dura tournament is the world's third oldest tournament which was started in shimala in 1898 by India foreign secretary sir Mortimer Durand. The All India football federation (AIFF),the governing body in football, introduced the national football league in 1996, in a

bid to raise the standard of the game in India Kolkata in the state of west Bengal .considered to be are home of Indian football. Despite football begin a highly popular game in India. Major victories at the international stage are few and far between. While national team languishes at the rock bottom of the rankings, the all India football federation has precious little to raise the standard of the game of India (**GOYAL, 2009**).

## **1.2 GAME OF FOOTBALL**

Football is not a matter of life and death. It is much more important than that. Almost all the countries play it and course of millions of people watch it. 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.

The game of football is one of the most popular game in the world. The game began in England in the 12<sup>th</sup> century but Edward II banned it in 1324. His successor Edward III in 1349, Richard II in 1389 and Henry IV in 1401 as also the Scottish rulers forbade people from playing football. In the beginning there were no definite rules of the game. Each team played with its own rules. An attempt was made by Thring and Dewinton to frame a uniform set of rules and the first set of football rules were framed in 1862 and revised in 1863. The football Association of England was formed and new rules of this game were framed in 1864.

An international football match for the first time was played between England and Scotland. Considering the growing popularity of the game, delegates from seven nations met on May 21, 1904 to form the Federation International de Football Association

(FIFA). FIFA organized the world football championship for the first time in 1930 at Montevideo. Football has spread itself all over the world and now there are more than 200 countries affiliated with FIFA.

Football, as it is seen today has undergone a tremendous improvement since its origin of all the events in human history, the one to attract the largest audience was not a great political occasion nor a special celebration of some complex achievement in the art or science but a simple game, a football match. If we examine it more carefully we could soon realize, that each football match is a symbolic event of complexity. One of the greatest strength of the game is, its simplicity. At its crudest level all that are needed is a ball and an open space with something to act as a goal post. No other sport is so easily available and so immediately inspiring. The most exciting quality of football is that it is a quick moving and fast flowing game. The simplicity of the rules and familiarity of the tactical moves make every moment to play immediately unpredictable to the watching eyes. Despite this no-body can ever be sure what will happen next. The player is never able to relax for a second. In an instant everything can change. Football has come a very long way and it shows no sign of retreating to the play room shelter of its number regions. As long as the human race is able to concern itself with more than survival, the football will have its place (**Morries, 1981**).

In football, a team of eleven men or women seek to advance a round inflated ball towards and between the opponent goal posts and under its cross bar by dribbling, kicking, striking or pushing the ball which is legally played.

The game football was introduced in India by the British. It was popular among the masses. The All India Football Federation (AIFF) was founded only in 1937. The very first football tournament was conducted by those people in 1880. It was called Durand Football tournament and was changed to Indian Football Association Shield in 1893. The national football championship for the Santosh Trophy was started in the year 1941 and the competition were conducted in different places of the country every year. The Federation Cup Football Tournament was introduced in the year 1977. The popular tournaments in India are Durand Trophy, Rovers Cup, Delhi Cloth Mills Cup, Stafford Challenge Cup, Bangalore, G.V.Raja Memorial Cup, Trivandrum, Nehru Trophy, Santosh Trophy, Junior National Championship and Sub Junior National Championship tournaments (**Thomas, 1964**).

### **1.3 ESSENTIAL SKILLS IN FOOTBALL**

In the development of the game of football, skills have come into play an increasingly vital role in the quest for victory. Top level teams perfect the skills and change them into a highly refined and sophisticated art and are constantly searching for better training. There are number of skills involved in the game of football like dribbling, kicking, ball control, volleying, trapping and application to different situations. Perfection of these skills and execution of them successfully are having direct impact on the total performance in the game of passing, dribbling , shooting, heading, trapping, chipping, throw-in and kicking.

### **1.3.1 PASSING**

In football the most valuable possession is the ball. To score and win a game is possible only when a team keeps possession of the ball. Therefore, the main foundation for the game of football is the skill of passing. Passing is simply sending the ball from one player to the next ball kicking, maintaining possession and trying to work your team into scoring opportunity. The ability to pass the ball for another players accurately and in a timely manner, as well as to direct it to players farther away is essential in order to keep the possession of the ball. Passing is also important as many goals are scored as a result of it. Teams that aim to retain control of the ball over longer periods of time, in the process making a large percentage of passes that gives low risk of losing the ball, are scored to play possession football. If successful, it will tire the opponents because they have to run and tackle more.

### **1.3.2 DRIBBLING**

In football dribbling refers to the maneuvering of a ball around a defender through short skilful taps or kicks with either of the foot. The purpose of such an action is to bring the ball past a defender legally and to create opportunities to score. Dribbling is one of the most difficult ball skills to master and one of the most useful attacking moves. In typical game play, players attempt to propel the ball toward their opponents' goal through individual control of the ball, such as by dribbling (running with the ball close to their foot). The ability to dribble is often invaluable especially in the third part of a pitch or at the wings, where most attacks take place. Dribbling creates space in tight situations where the dribbler is marked closely by a defender and the dribbler can either score or

create scoring chances after a successful dribble. However the dribbling, if poorly, mastered and used, may result in the loss of possession either when the ball is intercepted or tackled by a defender. When used appropriately, a good dribbler is often hard to dispossess; unsuccessful tackles may result in a useful free kick situation, a yellow card for the offender, or both. A good dribbler is a great attraction to the spectators and a great asset to the team.

### **1.3.3 SHOOTING**

The most important skill in football is shooting. A good striker is one who is hungry to score. Attitude and the hunger to see the ball ripple the back of the net are the driving force. A great striker is one who might miss five chances but is never afraid to take the next one should it come his way. The beauty of football is that everyone can score and football is played for scoring goals. In a game of ninety minutes, very few chances would come to a player to try the post and if a player is ill equipped to take a shot at the goal, the entire effort by the team goes waste which has toiled to create a scoring opportunity. In every situation when a shooting chance is on, there must be a determination, hunger, and an urgency to get the ball into the back of the net. The best places to aim are the corners, and wherever the goalkeeper "isn't" standing. Kicking with power is just as important as with accuracy. Even if you kick accurately, a ball with no power is easy for the goalkeeper to stop. You have to shoot to score goals, and you need to score goals to win. It is important to shoot accurately to improve your chances of scoring. So it is highly necessary that all the players in the team need to have mastery over the skill of shooting at the goal. A player needs to strike a balance between being



too eager and too reluctant to shoot. Shots should ideally be both accurate and powerful, although it is easier to achieve one of these at a time. Whether one should choose one or the other depends on the situation.

The choice of the part of goal to aim at is a contentious issue and depends on how many players are covering the goal. When only facing a goalkeeper, shots should be placed close to one of the posts. Ideally, a shot should also be placed just under the crossbar, but it is less difficult and also effective to shoot along the floor, towards the lower corners.

#### **1.3.4 HEADING**

Football is played with head to toe and that is why they say it is a beautiful game. Football is one of the few games in the world where you are asked to get your head into the path of a moving object. Every other game reflex takes your head out of the way. But in football heading is a skill that is useful from passing to scoring a goal. The most difficult balls to handle in football are the high balls and if a player is good at heading he can effortlessly face and use the high balls for passing, scoring, clearing and at times even for trapping. A good jump coupled with a perfect timing at the goal mouth can beat any number of defence and the goal keeper to score a goal. So it is very essential that football players should learn the correct heading techniques.

#### **1.3.5 TRAPPING**

Players should be able to bring any ball that comes to him into his control. Simply stopping the ball is usually the easiest way and in these cases the ball should be put in the ideal position for the next touch. Advanced players may use the first touch to make the ball

move in the direction they themselves plan to move. Also, the ball may be passed at one touch. Abruptly avoiding the ball instead of receiving it may trick opposing defenders, and thus be an offensive weapon in some situations. Trapping is one of the most important parts of playing football. Once you have it down, you can take hard passes, block shots, dribble better and score more. It is usually not a good idea to compare today's football with what was going on around the game in its early days, but when it comes to football receiving you simply cannot avoid a comparison. Today's game emphasizes a lot more on correct and dynamic football ball receiving than ever before, since spaces are tighter and the pace is higher, meaning that a player will have to develop this skill thoroughly if he or she is ever going to stand a chance on the pitch. In the 1930s for example, trapping the football ball with perfection was mainly important for attackers, in order to throw the other team's defence off balance, but today everyone from the goalkeeper to the winger is practically forced to have great receiving skills, since pressing is a constant factor for the other team in most cases. It is rather difficult to judge football receiving skills the same way other fundamentals skills of football are judged. For example, when trying to improve the passing ability, emphasis should be given to passing precision, power and timing. However, trapping a football ball requires a lot of smaller factors, which are all equally important.

### **1.3.6 CHIPPING**

Chipping a ball is using your foot as a wedge to strike the ball low with the toe of the striking foot contacting the ball low imparting arc and backspin. The knee is locked at impact. A 'chip' is when the football travels in a high arc. Usually a quick kick is used to send the ball up and over a short distance, rather than in a long, soaring flight. In football it is always difficult to pass the ball behind the defence players. To achieve this, the players need

to constantly switch positions to create space between the defence players to receive the ball. It takes a lot of effort and time to make such passes behind the defence players. Chipping is an ideal skill to put the ball behind the defence players. A correctly executed chip gives time for the receiver to control the ball. Moreover, balls from chip are easy to control.

In set plays also chipping is highly useful. Statistically for example, if the goal average of a match was 4-5 in the 1960s, as of the 1980s the average dropped to 2-3 goals per match. Therefore, facing a tighter defence with each opponent, coaches and players struggle to find an alternative for scoring from direct play. This is how set pieces gained the important status they hold today. A chip with a descending curve that should fall somewhere between the penalty spot and the six yard keeper protection box is the most dangerous place a free kick can land, since it is out of reach from the goalkeeper and close enough to the goal that a slight deflection with the head would push the ball into the net.

#### **1.4 CIRCUIT TRAINING**

Circuit training was invented in 1953 as an efficient way for coaches to train many athletes in a limited amount of time with limited equipment. The exerciser moved through a series of weight training or calisthenics arranged consecutively. It was a fast-paced workout of 15 to 45 seconds per station with little (15 to 30 seconds) or no rest between stations. Today, this is known as “circuit weight training”. Research has shown that it can increase muscular strength and endurance. There is a mild improvement in aerobic stamina but only if the rest periods are kept very short. Another variation is “aerobic circuit training” Aerobic stations like a treadmill, rower, bike or stepper (one to

five minutes per station) are interspersed with weight training stations. This protocol has been found to increase aerobic stamina and muscular endurance and endurance.

Appropriate form of training for most sports can be adjusted to suit age, fitness and health of the athlete. Exercises are simple enough to make each athlete feel a sense of achievement in completing them (By Lonnie Soloff, Cleveland Indians' Head Trainer). A wide range of exercises will select from which will maintain the athlete's enthusiasm.

Circuit training is a workout routine that combines cardiovascular fitness and resistance training. It was first proposed in the late 1950s as a method to develop general fitness. The initial routines were arranged in a circle, alternating between different muscle groups (hence the name circuit training). By allowing only a short rest interval of 30-90 seconds between stations, cardiovascular fitness is gained along with the benefits of resistance training. When developing a circuit training routine, a wide variety of exercises and equipment can be utilized. Much of the equipment is relatively inexpensive and includes surgical tubing, jump rope, your own body weight, dumbbells, medicine balls, physioballs and weight training machines. A circuit can consist of as few as six stations to as many as 15 stations based on the goals and pre-training levels of the participants.

Circuit training stations are generally sequenced in a way to alternate between muscle groups, which allows for adequate recovery. The rest interval between stations should be between 30-90 seconds and 1-3 minutes between circuits. A typical gym has several strength training machines and workstations, which enables the creation of several circuits. This benefit of variability challenges the skills of the participant and keeps them interested from session to session. Circuit training plays an integral role in the off-season

workouts of many professional athletes. It serves as a way to maintain general fitness while avoiding the high physical demands of in-season sport. Circuit training also serves as a segue to higher level strengthening programs in these athletes. The corner stone's of these circuits are exercises that stress multitude and core musculature. A participant should always consult with a physician before beginning a fitness program. Circuit training is an efficient and challenging form of conditioning. It works well for developing strength, endurance (both aerobic and anaerobic), flexibility and coordination. Its versatility has made it popular with the general public right through to elite athletes. For sports men and women, it can be used during the closed season and early pre-season to help develop a solid base of fitness and prepare the body for more stressful subsequent training.

A well designed circuit can help to correct the imbalances that occur in any sport played to a high level. It can also be one of the best types of training for improving strength endurance – be it for a sport such as soccer or a classic endurance event like the triathlon. If you haven't quite reached "elite athlete" status yet, circuit training is superb for general fitness and caters for a wide variety of fitness levels. A great time saver, it can be a refreshing and fun change from the more monotonous types of exercise. Circuit training in itself is not a form of exercise per se, but the way as exercise session is structured. Routines can be developed purely for strength development or for improving endurance or some combination of the two.

Circuit classes often seen in gyms and boot camps typically consist of about ten exercises stations completed for 60 seconds in sequence with 30-60 seconds rest between. While this is great structure for some individuals it's only one of many potential circuit

programs and may not be the best approach for endurance athletes for example (**Vander Kooi and others**).

## **1.5 RESISTANCE TRAINING**

It also known as strength or weight training .It has been one of the most popular forms of exercise for enhancing individual's physical fitness as well as conditioning athlete. Resistance strength and weight training have all been used to describe a type of exercise that requires the body's musculature to move (or attempt to move) against an opposing force usually presented by some type of equipment. Resistance and strength training encompasses a wide range of training modalities, including plyometrics and hill running. Weight training typically refers only to normal resistance training using free weights or some type of weight training machine.(**Malina et al, 2003**).

### **1.5.1 GOAL OF RESISTANCE TRAINING**

1. Injury prevention and rehabilitation General fitness training
2. Cosmetic training (body building)
3. Training for competitive sports.

### **1.5.2 HOW IS STRENGTH TRAINING ADDRESSED**

To promote and maintain good health and physical independence, adults will benefit from performing activities that maintain or increase muscular strength and endurance for a minimum of two days each week .It is recommended that 8-10 exercises be performed on two non-consecutive days using the major muscle groups. To maximize

strength development, a resistance (weight) should be used that allows 8-12 repetitions of each exercise resulting in volitional fatigue. Muscle-strengthening activities include a progressive weight-training program, weight bearing calisthenics, stair climbing, and similar resistance exercises that use the major muscle groups. Resistance training at least twice per week provides a safe and effective method to improving muscular strength and endurance by 25% to 100% or more. It is recommended that 8-10 exercises be performed on two non-consecutive days using the major muscles. A resistance (weight) should be used that results in substantial fatigue after 8-12 repetitions of each exercise. The emerging evidence on musculoskeletal health benefits and the potential population-wide effects of promoting skeletal health support the need for a public health recommendation that includes resistance exercise. The recommendations also summarize new research that links muscular strength to health benefits, such as protection against bone loss and a decreased risk of all-cause mortality.

### **1.5.3 EXAMPLES OF RESISTANCE TRAINING**

1. There are many ways you can strengthen your muscles, whether it's at home or the gym.
2. Free weights – classic strength training tools such as dumbbells or barbells.
3. Weight machines – these are devices that have adjustable seats with handles attached to either weights or hydraulics.
4. Resistance bands – these are like giant rubber bands that provide resistance when stretched.
5. Body weight – you can do many exercises with little or no equipment using your body weight instead, such as push-ups and squats.

### 1.5.4 BENEFITS OF RESISTANCE TRAINING

Regular resistance training offers many benefits.

1. It develops strong bones – strength training increases bone density and reduces the risk of osteoporosis.
2. It control your weight – as you gain muscle, your body burns calories more efficiently.
3. Build muscle which protects your joints from injury. It also helps you maintain flexibility and balance – and helps you remain independent as you age.
4. Boost your stamina – as you grow stronger, you won't fatigue as easily.
5. Improves your sense of wellbeing – strength training can boost your self-confidence, improve your body image and reduce the risk of depression.
6. Get a better night's sleep – people who regularly take part in a strength training program are less likely to have insomnia.
7. Manage chronic conditions – strength training can reduce the signs and symptoms of many chronic conditions, including arthritis, back pain, depression, diabetes and obesity.

Regular aerobic exercise, such as running or using a stationary bike, makes your muscles use oxygen more efficiently and strengthens your heart and lungs. When you strength train with weights, you're using your muscles to work against the extra pounds (this concept is called resistance). This strengthens and increases the amount of muscle mass in your body by making your muscles work harder than they're used to.



Most people who work out with weights typically use two different kinds: free weights (including barbells, dumbbells, and hand weights) and weight machines. Free weights usually work a group of muscles at the same time; weight machines typically are designed to help you isolate and work on a specific muscle. Most gyms or weight rooms set up their machines in a circuit, or group, of exercises that you perform to strengthen different groups of muscles.

People can also use resistance bands and even their own body weight (as in pushups, sit-ups, or body weight squats) for strength training. Many people tend to lump all types of weightlifting together, but there's a big difference between strength training, power lifting, and competitive bodybuilding! Strength training uses resistance methods like free weights, weight machines, resistance bands, or a person's own weight to build muscles and strength. Olympic lifting, or power lifting, which people often think of when they think of weightlifting, concentrates on how much weight a person can lift at one time. Competitive bodybuilding involves evaluating muscle definition and symmetry, as well as size. Power lifting, competitive weightlifting, and bodybuilding are not recommended for teens who are still maturing. That's because these types of activity can cause serious injuries to growing bones, muscles, and joints.

**Here are some basic rules to follow in strength training:**

1. Start with body weight exercises for a few weeks (such as sit-ups, pushups, and pull-ups) before using weights.
2. Work out with weights about three times a week. Avoid weight training on back-to-back days.

3. Warm up for 5-10 minutes before each session.
4. Spend no more than 40 minutes in the weight room to avoid fatigue or boredom.
5. Work more reps; avoid maximum lifts. (A coach or teacher can give you specifics based upon your needs.)
6. Ensure you're using proper technique through supervision. Improper technique may result in injuries, particularly in the shoulder and back.
7. Cool down for 5-10 minutes after each session, stretching the muscles you worked out.

## **1.6 PHYSICAL FITNESS**

Physical fitness is a universally accepted and realised terminology. Physical fitness is a capacity to meet the present and potential physical challenges of life with success. The present concept of physical fitness is not only freedom from disease, but also to gain enough strength, agility, flexibility, endurance and skills to meet the demands of daily life and to build sufficient reserve energy to withstand stress and strain.

Fitness improves general health and it is essential for full and vigorous living. The physically fit child will be more alert and eager to do things. Children are the future citizens of our country. The wealth of a nation depends entirely upon the health of every citizen of the country. Hence physical fitness of school children is a major important factor to be considered **(Govindarajulu , 1991)**.

Physical fitness is an important outcome of physical education and it is physical education in the school system that is most capable of bringing it out. The physical fitness over a long span and examination of the same reflect the status of health. Physical examination assesses the growth pattern and functional efficiency of sensory and motor

organs, functional efficiency of the body in terms of strength, cardiorespiratory endurance, flexibility, speed, agility, balance and neuromuscular co-ordination.

Physical fitness is a combination of qualities that enable a person to perform well in vigorous physical activities. These qualities include agility, endurance, flexibility and strength. Physical fitness and good health are not the same, though each influences the other (**Author's Guide, 1993**).

Physical fitness represents one of the several facets of sports and physical activity, which can have definite influences on the health and the well being of children and adolescents, as well as adults. The measurement of physical fitness raises several conceptual, methodological and technical problems, which explain why surveys including such measures have been scarce until recently (**P.A.Michaud and F. Narring, 1996**).

The Australian Fitness Education Award reflects a health related fitness philosophy and encourages students to set personal goals by aspiring to criterion based standards of achievement rather than by comparisons to others. With a view of turning children on rather than off physical activity, Australian Council for Health Physical Education and Recreation (ACHPER) has developed a new fitness testing approach that reduced comparison with others, eliminates embarrassment and focuses on learning about personal health and fitness. Helpful hints to encourage student participation and generally promote physical activity in school and community settings form an added feature of the Australian Fitness Education Award Resources (**Authors Guide, 1995**).

The American Alliance for Health, Physical Education, Recreation and Dance had published two standardized tests for the schools: The health - related physical

fitness test and the youth fitness test. According to AAHPERD, health - related physical fitness can be viewed thus: Physical fitness is a multifaceted continuum extending from birth to death. Affected by physical activity, it ranges from optimal abilities in all aspects of life through high and low levels of different physical fitness, to severely limiting disease and dysfunction (**Safrit, 1986**).

Health - related physical fitness is important to everyone and should be stressed by physical educators and medical people alike. Health related fitness is defined as the ability to perform strenuous activity without excessive fatigue showing evidence of traits that limit the risks of developing diseases and disorders which affect a person's functional capacity. Components of health related physical fitness are identified as muscular strength, endurance, flexibility, cardiorespiratory endurance and body composition (**Beverly Nichols, 1986**).

To enjoy an optimum state of health and physical fitness, exercises are quite necessary. Exercises are helpful in maintaining the sound body throughout life. Health and fitness afford the people an opportunity to live longer and they add to the quality of everyday life (**Jerold S. Greenberg and David Pargnam, 1986**).

## **1.6 PHYSICAL VARIABLES**

### **1.6.1 SPEED**

Speed is the ability to execute motor actions, under given conditions, in minimum possible time. Speed plays a vital role in all games and sports. Every player must possess acceleration speed, speed of movement and reaction time. Therefore to attain optimum performance in activities the main factor acceleration speed, speed of movement and

reaction time should be woven together. Speed is a natural gift. It is characterized by (a) the natural speed of concentration (b) natural neuromuscular co-ordination (c) explosive power which can be developed and (d) a resistive speed which can be developed. Development of speed is one of those cases where organism has to adopt itself to the steadily growing force of excitation of the stresses. This force is the frequency with which excitation act per unit time.

In order to improve speed, the organism must become used to reacting to this high frequency of excitation. The only solution is to exercise at the greatest speed. This speed can only be achieved for a brief time, because the strength it requires cannot be maintained for long (1) The distance must be short (2) The speed games must be short and (3) The interval between speed efforts must be long. Coaches and Physical Education teachers adopt different types of training methods for the development of speed and are trying to show superiority to their training. White head expressed strong belief in acceleration run for the development of speed of acceleration and sprint endurance. All these characteristics are improved by acceleration run (**Malina et al, 2003**).

### **1.6.2 ENDURANCE**

Endurance is defined as the capacity to continue to work under strain for a long period of time without undue fatigue (**Fall and Bigbee, 1968**). It is the ability to persist in strenuous activity this definition, may apply to the body as a whole, to a particular body system or to a local area of the muscular system. Endurance is one of the basic components of general athletic ability and it is usually considered to be the most important component of physiological fitness. Some activities of which endurance is of

prime importance are running, swimming, cycling, wrestling, basketball, handball, soccer, rugby and football. In all these activities endurance training occupies an important place in preparation for performance (**Jenson and Fisher, 1972**).

### **1.6.3 AGILITY**

Agility is the complex coordinative and the performance prerequisites which are primarily determined by mechanism involved in the control and regulation of movements with speed (**Singh-H**). Agility is one of the main components of motor fitness which is considered to be important. Agility is the ability of man to coordinate his movements and to synchronize them according to the requirements of changing conditions. In sports are distinguished between general and specific agility. "General agility is expressed by the ability of a person to perform any movement from the entire versatile range of sporting activities in functional and resourceful manner specific agility develops in accordance with the nature of the body movement of particular competition or event. Essentially specific agility is the agility to vary the technique of the selected exercise. But the greater the agility of sportsman the more precise, quicken and more effective his movement to restore balance. Agility also gains importance during conscious movements, correlation, undertaken by the sports man during training.

Previously it was believed that agility is a single factor by itself. Now it is believed that agility is a combination of several athletic traits including strength reaction time speed of movements, power and coordination. It is demonstrated to such movements as dodging, zig-zag running, stopping and skating and changing body.

In order to develop agility, it is necessary to consistently introduce the sportsmen to new more complicated movements and carryout already known movements under normal conditions. Agility is developed through practice and confidence in movements. Agility is an important ability in many sports activities as explained in a fast games of kho-kho by experienced players or by the trampolinist executing a triple tuistins back some result. It is possible for the physical education teacher to determine which individual in a class is most agile and which one need to work in agility in order to better perform the particular activity.

#### **1.6.4 STRENGTH**

(Kraus, 1965) Strength helps the muscles to exert force to physical activity can be performed without strength. When strength is less other life functions are handicapped. The functioning capacity of vital organs such as those of respiratory, circulatory and digestive systems depend upon the condition of voluntary muscles. Strength in hands helps to pull, push and to lift objects. Strength in legs helps to carry body weight and to carry extra burdens. Muscular strength is reduced or lost by inactivity. The main criterion of muscular contraction is its increasing tension which can be associated with the various phases of muscle length differentiated as follows:

1. Isometric contraction, in which the length of the muscle remains the same.
2. Concentric contraction, which involves shortening of muscles and
3. In eccentric contraction of which, the length of the muscle increases while its tension may remain the same even increase.

### 1.6.5 FLEXIBILITY

(Cureton1941), Flexibility is the ability to execute a wide range of movement in the joints while for repetition of work done in natural speed. Flexibility is most important. Flexibility helps to move bodily parts easily, takes less time, energy to perform a task. Elasticity in muscle reduces tension and provides maximum length. Thus yielding passive physical stretch.

Flexibility is defined by **Gummerson** as “the absolute range of movement in a joint or series of joints that is attainable in a momentary effort with the help of a partner or a piece of equipment.” This definition tells us that flexibility is not something general but is specific to a particular joint or set of joints. In other words, it is a myth that some people are innately flexible throughout their entire body. Being flexible in one particular area or joint does not necessarily imply being flexible in another. Being “loose” in the upper body does not mean you will have a “loose” lower body. Furthermore, according to SynerStretch, flexibility in a joint is also “specific to the action performed at the joint (the ability to do front splits doesn't imply the ability to do side splits even though both actions occur at the hip).”

### 1.7 PHYSIOLOGICAL VARIABLES

Physiology is the science of functioning of all the organs and systems of an organism. For the physiological system of the body to be fit, they must function well enough to support to specific activity that the individual is performing more over different activity make different demands upon the organism with respect to circulatory, respiratory, metabolic and neurologic process which are specific to the activity.



In physiology, one learns how the organs, systems, tissues, cells and molecules within cells work and how their functions are put together to maintain the internal environment. Physiology is the science dealing with the study of human body functions. Exercise physiology is the study of how body's structures and functions are changed as a result of exercise. It applies the concept of exercise physiology to training the athlete and enhancing the athlete's sports performance. **(Ajmer Singh, 2005)** For the purpose of this study, the following physiological variables were selected.

### **1.7.1 VO<sub>2</sub> MAX**

VO<sub>2</sub> max (also maximal oxygen consumption, maximal oxygen uptake or aerobic capacity) is the maximum capacity of an individual's body to transport and utilize oxygen during incremental exercise, which reflects the physical fitness of the individual. **(Laurence E. Morehouse and Augustus T. Miller, 1967)**. The name is derived from V - volume per time, O<sub>2</sub> - oxygen, max - maximum. VO<sub>2</sub> max is expressed either as an absolute rate in liters of oxygen per minute (l/min) or as a relative rate in millilitres of oxygen per kilogram of bodyweight per minute (ml/kg/min), the latter expression is often used to compare the performance of endurance sports athletes.

“Maximal oxygen uptake (VO<sub>2</sub>max) is widely accepted as the single best measure of cardiovascular fitness and maximal aerobic power. Absolute values of VO<sub>2</sub>max are typically 40-60% higher in men than in women.” Clearly, then, VO<sub>2</sub>max varies considerably in the population, with sex being a primary determining factor in this variability.

### 1.7.2 RESTING HEART RATE

The number of pulse beats per unit time, usually per minute. The pulse rate is based on the number of contractions of the ventricles (the lower chambers of the heart). The pulse rate may be too fast (tachycardia) or too slow (bradycardia). The pulse is bulge of an artery from the wave of blood coursing through the blood vessel as a result of the heart beat. The pulse is often taken at the wrist to estimate the heart rate (**Karvonen MJ, et.al 1957**).

## 1.8 PERFORMANCE VARIABLES

**Mathew, (1973)** states that “the performance may be defined as the overall ability and mastery of one individual in executing the skills involved in the game or it is the ability to execute the skills in an effective manner in all situations of the game”.

### 1.8.1 DRIBBLING

In football dribbling refers to the maneuvering of a ball around a defender through short skilful taps or kicks with either of the feet. The purpose of such an action is to bring the ball past a defender legally and to create opportunities to score. Dribbling is one of the most difficult ball skills to master and one of the most useful attacking moves. In typical game play, players attempt to propel the ball toward their opponents' goal through individual control of the ball, such as by dribbling (running with the ball close to their feet). The ability to dribble is often invaluable especially in the third part of a pitch or at the wings, where most attacks take place. Dribbling creates space in tight situations where the dribbler is marked closely by a defender, and the dribbler can either score or create scoring chances after a successful dribble. However, dribbling, if poorly mastered and used, may result in the loss of possession either when the ball is intercepted or

tackled by a defender. When used appropriately, a good dribbler is often hard to dispossess; unsuccessful tackles may result in a useful free kick situation, a yellow card for the offender, or both. A good dribbler is a great attraction to the spectators and a great asset to the team.

### **1.8.2 SHOOTING**

The most important skill in football is shooting. A good striker is one who is hungry to score. Attitude and the hunger to see the ball ripple the back of the net are the driving force. A great striker is one who might miss five chances but is never afraid to take the next one should it come his way. The beauty of football is that everyone can score and football is played for scoring goals. In a game of ninety minutes, very few chances would come to a player to try the post and if a player is ill equipped to take a shot at the goal, the entire effort by the team goes waste which has toiled to create a scoring opportunity. In every situation when a shooting chance is on, there must be a determination, hunger, and an urgency to get the ball into the back of the net. The best places to aim are the corners, and wherever the goalkeeper "isn't" standing. Kicking with power is just as important as with accuracy. Even if you kick accurately, a ball with no power is easy for the goalkeeper to stop. You have to shoot to score goals, and you need to score goals to win. It is important to shoot accurately to improve your chances of scoring. So it is highly necessary that all the players in the team need to have mastery over the skill of shooting at the goal. A player needs to strike a balance between being too eager and too reluctant to shoot. Shots should ideally be both accurate and powerful,

although it is easier to achieve one of these at a time. Whether one should choose one or the other depends on the situation.

The choice of the part of goal to aim at is a contentious issue and depends on how many players are covering the goal. When only facing a goalkeeper, shots should be placed close to one of the posts. Ideally, a shot should also be placed just under the crossbar, but it is less difficult and also effective to shoot along the floor, towards the lower corners.

### **1.8.3 PASSING**

In football the most valuable possession is the ball. To score and win a game is possible only when a team keeps possession of the ball. Therefore, the main foundation for the game of football is the skill of passing. Passing is simply moving the ball from one player to the next, maintaining possession and trying to work your team into scoring opportunity. The ability to pass the ball between nearby players accurately and in a timely manner, as well as to direct it to players farther away is essential in order to keep the possession of the ball. Passing is also important as many goals are scored as a result of it. Teams that aim to retain control of the ball over longer periods of time, in the process making a large percentage of passes that gives low risk of losing the ball, are said to play possession football. If successful, it will tire the opponents because they have to run and tackle more. Therefore, the skill of passing ought to be of utmost importance to a player.

#### **1.8.4 PLAYING PERFORMANCE**

The playing performance of the football players, the performance of the subjects were subjectively rated by three experts, that is by three qualified coaches cum officials. The individual and team performance related football skills were selected as criteria for subjective ranking of football playing ability by the experts. The criterion score were classified into two parts, viz., five individual skills (50 marks) and five situations where the individual player contributes to the team (50 marks) for a total of 100 marks. The average of the marks of the three experts was taken as the criterion score.

#### **1.9 OBJECTIVES OF THE STUDY**

1. To find out the effect of circuit training shows any changes on selected physical variables among men football players.
2. To find out the effect of circuit training on selected physiological variables among men football players.
3. To find out the effect of circuit training on selected performance variables among men football players.
4. To find out the effect of resistance training shows any changes on selected physical variables among men football players.
5. To find out the effect of resistance training on selected physiological variables among men football players.
6. To find out the effect of resistance training on selected performance variables among men football players.
7. To find out the combined effect of circuit & resistance training shows any changes on selected physical variables among men football players.

8. To find out the combined effect of circuit & resistance training on selected physiological variables among men football players.
9. To find out the combined effect of circuit & resistance training on selected performance variables among men football players.
10. To find out the combined effect of circuit & resistance training on selected physical, physiological and performance variables among men football players.

### **1.10 REASON FOR THE SELECTION OF THE TOPIC**

The researcher has taken interest on football game and also represented inter collegiate and south zone inter university tournament, because in this modern world the lifestyle and food habits are changing day by day. Hence most of players are affected by lack of training. The researcher selected circuit training and resistance training and combined training to identify the changes on physical, physiological and performance variables among football players. physical, physiological and performance variables are needed to analyze the various changes take place in their physical and mental level before and after the training period.

The researcher took this topic because there are lack of literature and limited studies in this field and especially for football players. Hence the researcher wants to find out the effect of circuit training and resistance training and combined training separately on football players.

### **1.11 STATEMENT OF THE PROBLEM**

The purpose of the study was to find out the combined effect of circuit training and resistance training on physical, physiological and performance variables of among men football player.

### **1.12 HYPOTHESES**

On the basis of conclusion drawn through review related to the study the investigator has framed the following hypotheses

1. It was hypothesized that there would be significant improvement on selected physical variables such as speed, strength, flexibility, agility and endurance due to circuit, resistance and combined training groups than control group among men football players.
2. It was hypothesized that there would be significant improvement on selected physiological variables such as vo2 max and resting heart rate due to circuit, resistance and combined training groups than control group among men football players.
3. It was hypothesized that there would be significant improvement on selected performance variables such as dribbling, passing, shooting and playing performance due to circuit, resistance and combined training groups than control group, among men football players.

### **1.13 SIGNIFICANCE OF THE STUDY**

1. The findings of the study would explore the status of the circuit training, resistance training and combined training of circuit and resistance training) among football players.

2. The study would bring out the combined effect of circuit training and resistance training among football players.
3. The findings of the study will helpful for the further research studies, also helpful for the academy of football players.
4. This study would give an exact idea about physical variables like speed, endurance, agility, strength and flexibility.
5. This study would give an exact idea about physiological variables cardiovascular endurance,  $vo_2$  max and resting heart rate.
6. This study would give an exact idea about performance variables like dribbling, shooting, passing and playing performance.

#### **1.14 DELIMITATIONS**

The following delimitations were taken into consideration in the interpretation of results:

1. The study was confined to only men football players.
2. The age ranged from 18 to 25 years.
3. Totally 60 men football players were selected as a subjects for this study, the subjects were divided in four equal groups 15 each for experimental group I (circuit training), and 15 for experimental group II (resistance training) and 15 for experimental group (combined training circuit and resistance training) and 15 for control group, were taken for the study.
4. The subjects were selected from various colleges at tirupathi.
5. The subjects were experimentally treated with circuit training, resistance training as well as combined training (circuit and resistance training).



6. The study was conducted on dependent variables such as speed, endurance, agility, strength, flexibility, cardiovascular endurance, vo<sub>2</sub> max, resting heart rate, dribbling, shooting, passing and playing performance.

### **1.15 LIMITATIONS**

The study was limited in the following aspects.

1. The socio-economical status was not taken into consideration.
2. Certain factors like life style, body structure, personal habits, and family heredity were not taken into consideration for this study.

### **1.16 DEFINITION AND MEANING OF THE TERMS**

#### **1.16.1 FOOTBALL**

(Robert, 2010) Football is the most popular sport in the world, All over the globe, people are attached to this game in deep and, passionate cultural way soccer or football, as it called most there is just something soccer of which over the year has earned nick names including the beautiful game, the simplest, the world's game and peoples game.

#### **1.16.2 CIRCUIT TRAINING**

(Vander Kooi EL., etal) Circuit training was invented in 1953 as an efficient way for coaches to train many athletes in a limited amount of time with limited equipment. The exerciser moved through a series of weight training or calisthenics arranged consecutively.

#### **1.16.3 RESISTANCE TRAINING**

(Malina et al, 2003) It also known as strength or weight training .It has been one of the most popular forms of exercise for enhancing individual's physical fitness as well as conditioning athlete.

#### **1.16.4 PHYSICAL FITNESS**

**(Jenson and Fisher, 1972)** Physical fitness is a universally accepted and realised terminology. Physical fitness is a capacity to meet the present and potential physical challenges of life with success. The present concept of physical fitness is not only freedom from disease, but also to gain enough strength, agility, flexibility, endurance and skills to meet the demands of daily life and to build sufficient reserve energy to withstand stress and strain.

#### **1.16.5 SPEED**

**(Hardayal Singh, 1984)** Speed plays a vital role in all games and sports. Every player must possess acceleration speed, speed of movement and reaction time.

#### **1.16.6 STRENGTH**

**(Hardayal Singh, 1984)** It refers to the capacity of a muscle or a group of muscles to do work with power.

#### **1.16.7 AGILITY**

**(Hardayal Singh 1991)** Agility is the ability to change directions quickly and control body movement.

#### **1.16.8 FLEXIBILITY**

**(Johnson and Nelson 1988)** Flexibility is the range of motion around a joint. Good flexibility in the joints can help prevent injuries through all stages of life.

#### **1.16.9 ENDURANCE**

**(Fall and Bigbee)** Endurance is defined as the capacity to continue to work under strain for a long period of time without undue fatigue.

### **1.16.10 PHYSIOLOGY**

**(Ajmer Singh, 2005)** In physiology, one learn how the organs, systems, tissues, cells and molecules within cells work and how their functions are put together to maintain the internal environment. Physiology is the science dealing with the study of human body functions.

### **1.16.11 VO<sub>2</sub> MAX**

**Singh** “Maximal oxygen uptake (VO<sub>2</sub>max) is widely accepted as the single best measure of cardiovascular fitness and maximal aerobic power. Absolute values of VO<sub>2</sub>max are typically 40-60% higher in men than in women.” Clearly, then, VO<sub>2</sub>max varies considerably in the population, with sex being a primary determining factor in this variability.

### **1.16.12 RESTING HEART RATE**

**Karvonen and others 1957**, The number of pulse beats per unit time, usually per minute. The pulse rate is based on the number of contractions of the ventricles (the lower chambers of the heart).

### **1.16.13 PERFORMANCE VARIABLES**

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