

ગુજરાત રાજ્યના શિક્ષણવિભાગના પત્ર-ક્રમાંક  
મશબ/1215/170-179/છ, તા. 26-02-2016 થી મંજૂર

# YOGA, HEALTH AND PHYSICAL EDUCATION

## Standard 11



### PLEDGE

India is my country.  
All Indians are my brothers and sisters.  
I love my country and I am proud of its rich and varied heritage.  
I shall always strive to be worthy of it.  
I shall respect my parents, teachers and all my elders and treat everyone with courtesy.  
I pledge my devotion to my country and its people.  
My happiness lies in their well-being and prosperity.

**Price : ₹ 60.00**



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## **FUNDAMENTAL DUTIES**

It shall be the duty of every citizen of India :

- (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- (b) to cherish and follow the noble ideals which inspired our national struggle for freedom;
- (c) to uphold and protect the sovereignty, unity and integrity of India;
- (d) to defend the country and render national service when called upon to do so;
- (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;
- (f) to value and preserve the rich heritage of our composite culture;
- (g) to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures;
- (h) to develop the scientific temper, humanism and the spirit of inquiry and reform;
- (i) to safeguard public property and to abjure violence;
- (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;
- (k) to provide opportunities for education by the parent or the guardian, to his child or a ward between the age of 6 and 14 years as the case may be.

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## About This Textbook....

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It is stated in National Curriculum Frame Work 2005, Yoga, Health and Physical Education is essential for development of child. The problems occurring in the school can be solved with the help of this subject. The child's development at school depends on nutrition and well-planned physical activity programmes. This subject is important for allround development of child and development for intellectual and responsible citizen. This curriculum area adopts a holistic definition of health within which physical education and yoga contribute to the Physical, Social and mental development of child. So the teacher should take proper care to teach and organise suitable activities.

With reference to National Curriculum Frame Work 2005, the subject matter of syllabus of all subjects has been framed afresh keeping various stages in mind.

In this book, a well co-ordinated approach based on new syllabus has been adopted for the first time. It mainly consists of subject matters of various sciences of Yoga, Health and Physical Education. Yoga is an immortal valuable heritage of Indian Culture. As per NCF 2005, 'The need-based approach could guide the diminsions of the Physical, Psychological and mental aspect that need to be included at different levels of schooling. A basic understanding of the concerus is necessary; but the more important dimension is that of experience and development of health, skills and physical well-being through practical engagement with play, exercise, sports and practices of personal and community hygiene. These demands of children are tried to be integrated into the book. Sports and games of the local area are included. Moreover games of other countries are also included in the book. An attempt has been made to reduce the load of subject matter and hypothesis. Three different books on Yoga, Health and Physical Education have been incorporated in a single text book as an independent subject of study.

**Unit - 1 : Yoga education :** In this unit ASANAS,

SHATKRIYAS (Shodhankriyas) and YOGMUDRA are included.

In ASANAS, meaning, basic position, method, to take care and benefits of Asanas are given. Baddha Padmasana, Vajrasana, Sinhasana, Matsyasana, Bhadrasana, Utkutasana, Saptavajrasana, Vipritkarni, Trikonasana are included in this unit.

In Shatkriya (Shodhankriya), Basti, Neti, Tratak, Nauli and Kapalbhathi are included. A method, to take care and benefits of Shatkriya are stated.

Gnanmudra, Pruthvimudra, Varunmudra, Rhudaymudra of Yogamudra are mentioned with its position.

The necessary pictures and figures are given to help the understanding of the unit. Yoga Science is an immortal valuable heritage of Indian Culture. Yoga has a capacity to put of spiritual approach of life, not only that but it is useful in practice also. Yoga is a perfect method for skillful work, freedom from stress, concentration of mind, original creation and development of personality.

## **Unit - 2 : Health Education :**

In this unit, there are three chapters, in which important matter for maintaining child development are given : (1) Individual Health. The meaning of exercise and type of exercise are given in it. (2) Environmental Health. In this chapter, the subject matter of environmental health such as water, pollution of water, problem of disposal of garbage, drainage system are given. (3) Infections diseases and their prevention. In this chapter the subject matter infectious diseases spreading the diseases, characteristics, prevention, treatment of infectious diseases are given. This unit is useful for maintaining the child's health.

**Unit - 3 : Physical Education :** In this unit, there are three types of activities mentioned.

- (1) **Athletics :** In this sub-unit, Ground, equipments, skills and rules of Running, Jumping and Throwing are given with figures, pictures.
- (2) **Games :** In this sub-unit, Ground, equipments, skills and rules of Hockey, Soft-ball, Table-Tennis, Volley-ball are given with pictures and figures.
- (3) **Gymnastics :** In this sub-unit, Ground, equipments, skills and rules are given with picture and figures.

This unit is important for development of sportsman spirit and education for responsible citizen for students.

The instruction of NCE - 2005 for Textbook should carry out. It is mentioned that the more recent addition to the curriculum is Yoga. The entire group must be taken together as a comprehensive health and Physical Education Curriculum, replacing the fragmentary approach current in schools to-day. As a core part of the curriculum, time allocated for games and Yoga must not be reduced or taken away under any circumstances.

We hope that this book assists in the Herculean task of development and national building. It shall also effectively contribute in making the students knowledgeable and intelligent along with moulding them as responsible citizens.

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In shashtras before practising Yogas six actions are shown in order to purify the body. In Aayurved-Shashtra different five types of karmas are prescribed in order to remove 'Doshas' (disorders) of the body Vata, Pitta and Cough of the disease, They are called Panchkarmas In the same way in Yogshashtra for purification of the body of a person description of Shatkarmas is seen. In Panchkarmas various medicines particularly are used while in Shatkarmas there is nothing like medicine. Shatkriyas are to be performed according to the guidance of proper guide, expert.

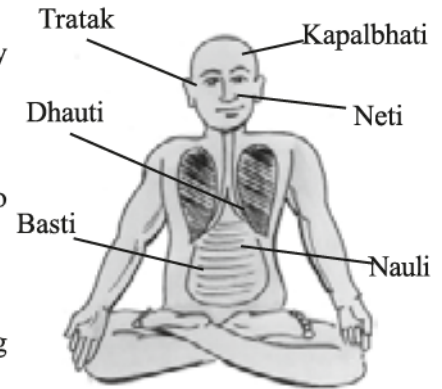
As shown in Hath Yoga Pradeepika

“द्योतिर्वस्तिस्तथ नेतिस्वाट कं नौलिकं तथा ।  
क पालभातिश्चैतानि षट् क माणि प्रचक्षते ॥”

- i.e. (1) Dhauti  
(2) Basti  
(3) Neti  
(4) Tratak  
(5) Nauli  
(6) Kapalbhati

These six activities are called Shatkarmas. It is known as Shodhanpadhati (purification methods) as it purifies body. Each activity purifies certain part of various organs of the body. It is a specific characteristic of this Shatkriyas which action affects on which organ can be understood by this figure (picture).

- (1) **Dhauti** : Purifies upper part of the body like gullet, belly (stomach).  
(2) **Basti** : Purifies (cleanses) rectum below large intestine.  
(3) **Neti** : Purifies (cleanses) respiratory system from neck to nasadwar.  
(4) **Tratak** : Cleanses eyes and makes them bright.  
(5) **Nauli** : Cleanses all the organs of stomach including small and large intestines.  
(6) **Kapalbhati** : Purifies complete respiratory path (mode).



Shatkriyas

**Method, benefits and things to bear in mind of various karmas :**

**(1) Dhauti :**

Dhauti means 'to wash or clean'. This process cleanses organs like gullet and stomach and removes disorders of cough and pitta. In Gherand sanhita thirteen types of dhauti have been discussed, but mainly three types of dhauti are important in practice.

- (1) Vaman Dhauti (2) Vastra Dhauti (3) Dand Dhauti.

- (1) **Vaman Dhauti** : In this process stomach is washed through water and vomiting is done.

**Method :**

- (1) Take about two litres of warm water. Add 2.3 spoon-ful of salt.
- (2) Quickly drink six to eight glasses of water.
- (3) After drinking water upto neck completely, feeling like nausea or vomiting may be. Then sit on legs neither quite standing nor sitting position (ubhadak). Then try to vomit admitting your three fingers in mouth upto neck.
- (4) In this way vomit frequently and draw out, the taken water completely.



Vaman Dhauti

**Benefits :**

- (1) Vaman Dhauti increases the digestive power.
- (2) It gives relief in pitta or acidity and gaseous, trouble.
- (3) It becomes useful in diseases of cough like old colds and asthma.

**Things to bear in mind :**

- (1) Keep nails of fingers of hands trimmed (cut), so that it may not cause any injury to the throat.
- (2) It is essential to practise Vaman Dhauti in the morning, with empty stomach.
- (3) In this process, water is to be drunk quickly. Continue vomiting, till all the water comes out.
- (4) If you have ulcers in throat or stomach or any heart-disease or high blood pressure, then avoid doing this activity.
- (5) After doing this process, cleanse mouth nose and teeth properly and nothing to be eaten upto half an hour.

- (2) **Vastra Dhauti** :

In this process stomach and gullet are cleansed with cloth. In each Shashtra, only Vastra Dhauti is mainly described.

**Method :**

- (1) Strip of soft and very thin cloth, four inch broad and twenty two feet long is used. It is called Dhauti in Yogic language.
- (2) Soak this strip of cloth in hot water. It is used, while it is slightly warm.
- (3) Take out the tongue and put one end of the strip deep inside and then set down the strip slowly from neck - go on bringing down the strip.
- (4) On swallowing strip, it would enter in stomach. When 1 foot (33 cm) strip remains out, cleanse inside the stomach through naulikriya i.e. the strip is to be turned round in the stomach.
- (5) Finally at the end, strip of cloth should be taken out slowly.



Vastra Dhauti



**Benefits :**

- (1) This Karma removes all types of diseases pertaining to cough including coughing colds and asthma.
- (2) This gives relief in diseases of stomach like acidity and gas. It helps in reducing, fat by the stomach and gullet being cleansed. It enhances the digestive system.

**Things to bear in mind :**

- (1) Perform Dhautikriya in morning with empty stomach.
- (2) Vastra dhauti is rather a difficult process. So in the beginning try to swallow two to three foot cloth-strip and gradually it may be increased.
- (3) Vastra dhauti gives bodily exertion less as compared to Vaman dhauti. Even then those who have ulcers in stomach or neck should not perform this process.

(3) **Dand Dhauti :** In this process a long stick (Dand) or soft rubber tube 70 cm long is being used.

**Method :**

- (1) Drink two to three glasses of warm salty water.
- (2) Like Vastra dhauti, admit the rubber tube inside the neck and slowly through swallowing process move and slip the tube towards stomach.
- (3) As the tube reaches into the stomach polluted water of the stomach begins to come out.
- (4) After all the water getting out of the tube, it is drawn out slowly.

**Benefits :**

- (1) Dand dhauti process yields all the same benefits as of Vaman dhauti and Vastra dhauti.
- (2) Cough diseases like asthma gets rid of.
- (3) Acidity and gaseous trouble of the stomach are removed and the digestive-power increases.
- (4) In dand dhauti water comes out rather easily as compared to Vaman dhauti and draws out of stomach cough, pitta and gas.

**Things to bear in mind :**

- (1) He who has chest-ache due to excessive cough or ulcers in neck and stomach should not perform Dand dhauti.
- (2) Let not the tube go excessively in the stomach. Clean the tube properly before using it.
- (3) All the water taken in finally should be drawn out. This should be strictly watched.

**(2) Basti :**

Basti region means part of stomach under navel. This process cleanses large intestine and rectum. Basti is of two types :

- (1) Jala basti
- (2) Sthala basti or dry basti

### **(1) Jala Basti :**

#### **Method :**

- (1) Sit in as much water so that the navel remains in water. Then let the rectum contract toward inside and then let it loose. Perform this nauli kriya frequently. Water goes inside rectum and large intestine through anus. Shake the stomach forcefully and draw out some water forcibly through anus.

#### **Benefits :**

- (1) This process is like an unfailing medicine for constipation.
- (2) It improves digestive power by increasing activeness of the intestine.
- (3) Diseases like piles, hemorrhoids fistula in anus. (occurring in anus) are get rid of.

### **(2) Sthal or Shushka (Dry) Basti :**

#### **Method :**

- (1) Shushka means dry. This is also known as Vayu (gas) Basti. Lower part of the stomach is cleansed through air. Like Mulbandha process of frequently stretching muscles of the anus and letting them loose. It is called Ashvinimudra.

#### **Benefits :**

- (1) Makes senses strong.
- (2) Makes the body powerful.
- (3) It increases activeness of all the organs contained in the stomach like spleen, liver.

Jala Basti or Shushka Basti is sparingly used in modern times. Modern method i.e. use of enema is seen nowadays, but the ancient method is more beneficial than the modern method. Bastikriya is the best process for eradication of gastric diseases.

#### **Things to keep in mind :**

- (1) Practising basti with empty stomach is always beneficial.
- (2) When excessive illness prevails, never perform basti.
- (3) In Shushka basti by performing paschimottanasana anus has to be frequently contracted and expanded.

### **(3) Neti :**

The process purifying the respiration path from nose to neck is called Neti. It is mainly of two types : (1) Jal neti (2) Sootra neti.

#### **(1) Jal neti :**

#### **Method :**

- (1) For Jal neti special type or Netipot is used.
- (2) Warm salty water is filled in the netipot.
- (3) While sitting or standing lean slightly forward. Admit the funnel of the Netipot into the right nostril and bend head on left side.



Jal neti

- (4) Water of Netipot enters through right nostril and comes out through left nostril. This type of process is practised.
- (5) Continue this activity for about a minute. Then the process be repeated for left nostril. Thus both the nostrils are to be purified.
- (6) Like frequent sneezing all the path from neck to nostril is required to be cleansed and then dried.
- (7) At the end, Kapalbhata is required to be practised.

**Benefits :**

- (1) This process gives very much relief in colds - coughing, head-ache and migraine.
- (2) It makes nerve endings contained in nose more efficient. It makes sense of smell more efficient.
- (3) Piles of nose, weakness of eyes and diseases of head are get rid of.
- (4) Memory power becomes bright.

**Things to bear in mind :**

- (1) When suffering from severe colds or ulcers in nose or neck this process should not be done.
- (2) After doing Jal neti avoid doing Asanas like Shirshasana.
- (3) Bear in mind that in Jal neti jaldhara (water current) is to be in fixed proportion for constant one minute.
- (4) At the end, it is very essential to make nose completely dry.

**(1) Sootra neti :**

Sootra means string of cotton. Put it in the nose and allow it to go so that it reaches the neck. Then open mouth and stretch out its hard part out of mouth and practise it doing forward-backward. After some time stretch the string out and repeat the activity through other nostril.

(2) Now, in practice, for sootra neti catheter of rubber is used. It is preferable.

**Benefits :**

- (1) It purifies the part from nostril (nose) to the neck.
- (2) It is very beneficial for frequent colds and chocking up of nose.
- (3) It gives relief in all the diseases of the parts above the chest. Gives relief in the diseases of Urdhvajatrugata.
- (4) Eyes become healthy and they get brightness.
- (5) It gives relief in headache and migraine.



Sootra neti

**Things to bear in mind :**

- (1) Catheter tube or sootra is to be stretched out through nose only.
- (2) Sootraneti is to be practised after Jal neti.
- (3) End of the tube of catheter is to be stretched out by admitting index (first) finger and the middle finger of the right hand in the mouth.
- (4) Holding both the ends do massage (rubbing) by stretching slowly inside and outside.
- (5) Catheter should be used after it is boiled in hot water. In the beginning Sootra neti should be practised in presence of a proper guide.

**(4) Tratak :**

The process of keeping attention (sight) firm on certain determined thing is called Tratak. It removes impurity of eyes.

**Method :**

- (1) Sit in Sukhasana. Arrange a table of the same height in front of the mouth.
- (2) Arrange a burning candle and put on a table at the same height so that sight of eyes fall one and half or two feet away from the face.
- (3) Make the sight firm on the flame of the candle without moving eyelashes.
- (4) Let little water flow from eyes, Slowly close your eyes, when burning sensation or water comes out of eyes. Imagine the flame with closed eyes.
- (5) After some time, open your eyes and do Tratak again.



Tratak

**Benefits :**

- (1) This process increases activeness of tear-glands and eyes become strong. The eyesight becomes bright.
- (2) Concentration increases by removing all the disorders of eyes.
- (3) Indirectly Tratak makes the head (brain) vigilant and thereby will-power increases.
- (4) Mind and Chitta become pure and this has a good mental effect.
- (5) This is an easy way to go ahead toward the Meditation path.

**Things to bear in mind :**

- (1) Take care that there is no unnecessary pressure or stress on eyes.
- (2) Increase time-period of Tratak without any twinkling, through frequent practice.
- (3) Tratak is a joyful process. Mind well that it does not become troublesome or painful.
- (4) At the end of the process of Tratak it is necessary to make eyes loose. For that rub both the palms of hands with each other quickly and produce heat through friction. Put both the hands on eyes without applying pressure on eyes and have heat collyrium. Massage slowly the muscles around eyes.

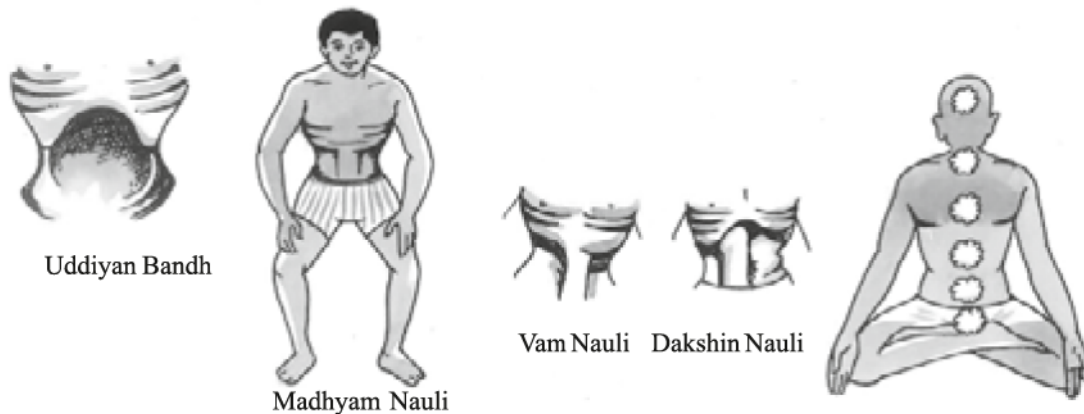
**(5) Nauli :**

Nauli means massage of organs of Stomach, Nauli is a higher stage of uddiyan Bandh. Generally, vertical two muscles of the stomach are called Nal. The process of separating both the muscles and moving them is called Naulikriya. It is essential to understand uddiyan Bandh before practice of Nauli.



**Method :**

- (1) Keep distance of about one foot between two legs, bend a little from the waist. Keep both the hands on thigh.
- (2) Take a deep breathing once. Stretch the stomach completely inside. Exhale completely. At this time stretch navel and stomach towards back as much as possible and stretch the diaphragm upside making a pit as much as possible in stomach.
- (3) While the diaphragm goes upward, there is hollowness in the stomach, which makes a bandh. It is called Uddiyan Bandh.
- (4) Now apply pressure on both the thighs with palms of hands and separate muscles of the navel and to move them forward or backward. This process is called Nauli.

**Types of Nauli :**

- (1) Madhyam Nauli
- (2) Dakshin Nauli
- (3) Vam Nauli
- (4) Nauli Chalan.

In the process of Uddiyan Bandh by stretching out the muscles in between the stomach staying motionless nauli is created. During Naulikriya, if muscles of right side of the stomach are stretched out by applying pressure on thigh on right side with right hand, then it would be Dakshin Nauli. In the same way stretching muscles out of the left side would be Vam Nauli. Nauli of these three types can be moved round and round towards right side or the left side. The process of making muscles of the stomach moving in round is called Nauli chalan.

**Benefits of Nauli :**

- (1) This process activates all the organs of the stomach.
- (2) Intestine being washed, excreta moves towards rectum. Hence Nauli is an effective remedy of the hardened constipation.
- (3) The digestive system improves due to blood-flow towards stomach becoming regular. All the diseases pertaining to the digestive system get rid of.
- (4) On getting internal massage to organs of the stomach and navel extra fat deposited on the stomach is removed.

**Things to bear in mind :**

- (1) Nauli is a complex process. Hence its practice minutely is necessary.
- (2) After attaining mastery over Uddiyan Bandh, thereafter only gradually Madhyam Nauli, Dakshin Nauli, Vam Nauli and at the end, Nauli chalan should be practised.
- (3) In pregnancy, high B.P. heart-disease or ulcer in stomach, hernia - such persons should not practise Nauli.
- (4) In the beginning this process should be done only under the presence and guidance of experienced Yoga teacher.

## **(6) Kapalbhathi :**

Kapal means mastishka (head) and bhati means to be enlightened, to be brilliant. This process flashes head (and brain). Hence it is called Kapalbhathi. Kapalbhathi yields very effective results, like Pranayam. Hence certain people call it Kapalbhathi - Pranayam. But in fact, Kapalbhathi is the best shodhankriya.

### **Method :**

- (1) Sit in Padmasana or Sukhasana. Keep body erect.
- (2) Make gnyanmudra through palms. Keep both the hands on knees.
- (3) Close eyes and concentrate on process of respiration.
- (4) Now push muscles of stomach inside and exhale breath through both the nostrils speedily.
- (5) Let muscles of the stomach loose little. Again push the stomach inside and exhale breath.
- (6) In this way frequently exhaling breath - process means Kapalbhathi.
- (7) When you get tired by constant exhaling (breathing out) stop the process and experience the change occurred in speed of breath. At this time Meditate on Gyan Chakra in between both the eye brows and experience it.
- (8) After rest for proper time period, repeat Kapalbhathi three to five times.

### **Benefits :**

- (1) Due to this process, poisonous elements like carbondioxide (CO<sub>2</sub>) in lungs are breathed out completely and the respiratory path is purified.
- (2) On getting internal massage to all the organs of stomach, diseases like gas, acidity, constipation are removed and it enhances the digestive power.
- (3) It yields effective results in diseases of diabetes, liver and spleen.
- (4) It makes physical structure beautiful by removing excessive fatness or thinness.
- (5) Face become bright and beautiful.
- (6) All diseases of lungs, even ashthama are recovered.
- (7) It activates all the cells of head. In view of Yoga, Gyan Chakra is awakened.

### **Things to bear in mind :**

- (1) At the end of Kapalbhathi, important thing is that process of respiration stops for some time (few moments) and there is no desire to breath. This conditon is called 'Keval Kumbhak'. In Keval Kumbhak, mind becomes totally quiet and delightful experience of Prasannata (eternal joy).
- (2) While doing Kapalbhathi, no movement to be done and attend that the body may not bend forward or backward.
- (3) In this action, breath is forcefully exhaled then one has not to breathe in. Sadhak has to do only Rechak. Only Rechak form means Kapalbhathi.
- (4) In the initial stage, begin with 60 strokes in one minute. Then while practising on a regular basis, gradually maximum upto 120 strokes can be reached.

Without performing Shatkarma if Pranayam is done, then pain or labour is experienced to get achievement. After removing impurities of body through Shatkarma further practice of Yoga makes the body more matured.

## EXERCISE

### 1. Answer the following questions :

- (1) What is Shatkarma ? Explain its importance.

### 2. Write short notes :

- (1) Dhautikriya (2) Basti (3) Neti  
(4) Tratak (5) Nauli (6) Kapalbhathi.

### 3. Answer the following questions in short :

- (1) Give names of six kriyas of Shatkarma.  
(2) State types of Dhautikriya. State its two benefits.  
(3) Write types of Basti. State things to bear in mind therein.  
(4) State main types of Neti and its two benefits.  
(5) What should be done at the end of Tratakkriya ?  
(6) State benefits of Tratakkriya.  
(7) State types of Nauli. Describe each in one line.  
(8) State benefits of Naulikriya.  
(9) State the method of Kapalbhathi.  
(10) State the things to bear in mind at the time of Kapalbhathi.  
(11) State four main benefits of Kapalbhathi.

### 4. Select Proper Choice :

- (1) Which kriya of Shatkarma is known as pranayam ?  
(A) Nauli (B) Basti (C) Kapalbhathi (D) Tratak
- (2) Give name of the Shatkriya cleansing small-big intestines.  
(A) Dhauti (B) Basti (C) Neti (D) Nauli
- (3) Which Karma cleanses the lowest part of the digestive system ?  
(A) Nauli (B) Dhauti (C) Neti (D) Basti
- (4) Generally how many types of Dhauti are there ?  
(A) Five (B) Nine (C) Four (D) Three
- (5) To which Karma Ashvinimudra connected ?  
(A) Tratak (B) Basti (C) Dhauti (D) Neti
- (6) How many main types of Basti are there ?  
(A) Two (B) Three (C) Four (D) Six
- (7) In Basti which Asana is used ?  
(A) Padmasana (B) Pavanmuktasana  
(C) Sukhasana (D) Pashchimottasana
- (8) Which Karma is essential to do at the end of Jal neti ?  
(A) Tratak (B) Dhauti (C) Nauli (D) Kapalbhathi
- (9) Which Shatkarma gives benefit in Urdhvajatrugata diseases ?  
(A) Nauli (B) Neti (C) Kapalbhathi (D) Tratak
- (10) Nowadays in which Karma the thin catheter of rubber is used ?  
(A) Jal neti (B) Sootraneti (C) Dand dhauti (D) Vastri dhauti
- (11) Which bandh is used in Nauli karma ?  
(A) Janubandh (B) Mulbandh (C) Galabandh (D) Uddiyanbandh

- (12) Which organ is specially benefitted by Tratakriya ?  
 (A) Nose (B) Mastishka  
 (C) Eyes (D) Organs of the stomach
- (13) Which of the following is not a type of Naulikriya ?  
 (A) Madhya nauli (B) Urdhva nauli (C) Vam nauli (D) Dakshin nauli
- (14) The process of moving muscles of the stomach round and round alongwith uddiyanbandh. What is it called ?  
 (A) Jal dhauti (B) Vastra dhauti (C) Madhya nauli (D) Nauli chalan
- (15) Which asana is the best for Kapalbhati ?  
 (A) Paschimottasana (B) Shavasana (C) Padmasana (D) Vajrasana
- (16) In which Shatkarma Keval Kumbhak is experienced ?  
 (A) Tratak (B) Nauli (C) Kapalbhati (D) Neti
- (17) How many main types of Neti are ?  
 (A) Two (B) Three (C) Four (D) Six
- (18) Which Shatkriya purifies carbon dioxide of breathing path ?  
 (A) Jal neti (B) Sootra neti (C) Dhauti (D) Kapalbhati
- (19) Which Shatkriya makes the face naturally beautiful ?  
 (A) Kapalbhati (B) Tratak (C) Dhauti (D) Neti
- (20) During Kapalbhati how many maximum strokes are to be done in one minute ?  
 (A) Hundred (B) Sixty  
 (C) Eighty (D) One hundred twenty
- (21) Kapalbhati is the process of which form only ?  
 (A) Steadiness (B) Unsteadiness (C) Speedy respiration (D) Joy of mind
- (22) What is the specific experience in Keval Kumbhak ?  
 (A) Steadiness (B) Activeness (C) Speedy breathing (D) Cheerfulness
- (23) Why Shatkarma is given more importance in Shashtra ?  
 (A) For Yama-Niyam (B) Intellactual development of the body  
 (C) For achievement (Siddhi) of Asana (D) To make the body mature for Pranayama
- (24) Like Shatkarman how many karmas are there in Aayurved Shashtra ?  
 (A) Two (B) Tri karma (C) Shatkarma (D) Panchkarma

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Our Rishimunis (sages) and great persons had made Ashramshalas as their laboratories and that too, without any scientific tools and equipment. They experienced of their own. As an essence of their experience they have given us many types of Vidyas useful for life. Yogavidya is one of them. Yogamudra is born from Sadhana (effort for achievement), Aaradhana (worship) and Upasana (devotion) of Yoga. Yogamudra is a Science and Shashtra too.

History about commencement of Yogamudras is not available. This Mudrashashtra is very ancient. At that time in India Science was not developed as much as compared to today's Science. Thus Mudrashashtra has been prevalent since Vaidic times.

When we pray to God, or do Namaskara to elders or bow mutually, then finger-tips of hands join together and a definite type of figure becomes. It is called Namaskara mudra. Mudra is called art of bodily expression or is a process of making hearing power vigilant. In our Shashtras names of seven Mudras are available.

In the art of dancing also in the posture of various organs of body many Mudras are seen. In idols of Gods and Goddesses, in pictures of greatmen various Mudras are clearly seen. In day-to-day life in various actions, we do Mudras naturally e.g. shaking hands, clapping hands etc. when we hold a finger of a child, that condition (posture) of hands is also a Mudra.

These Mudras play an important role in making a person healthy. If Mudras are performed with various types of physical Aasanas, energy of body increases. Hence it is said in Shashtras.

नास्ति मुद्रासमं सिद्धिं क्षितिमंडले । i.e. there is no other Kriya (action) like Mudra for success and achievement.

A special type of electric energy constantly is thrown out from fingers of our hands. By joining and arranging fingers in different ways waves of energy accordingly flow and it affects ductless glands. It balances Panchmahabhoot (Prithvi, Jal, Agni, Vayu, Aakash) and Tridosh of our nature (vat, pitta, cough). Thus the objective of Mudra - study and practice is development of a person and to bring positive changes in his nature.

#### **Things to bear in mind while doing Yogamudra :**

- Place (location) for study should be clean, airy and quiet. Definite place and definite time is beneficial.
- Loose and cotton clothes to wear. Let body be loose.
- Keep mind quiet and delightful study with concentration.
- Regular practice of Mudras initially for 10 minutes and then slowly and gradually upto 40 minutes can be done then it is more beneficial.
- Never try to perform Yogamudra by stretching fingers too much.
- In Yoga practice while doing Mudras avoid wearing finger-ring, ring on wrist or wrist watch.
- All the things required to bear in mind should be taken into consideration for Yogamudras. It definitely benefits.

### Some Useful Mudras :

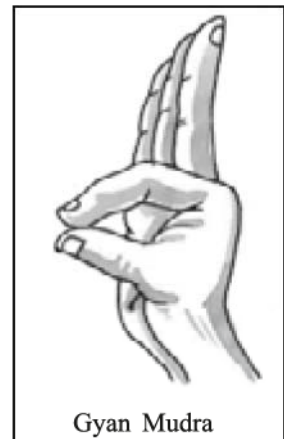
#### 1. Gyan Mudra :

##### Position :

- (1) Sit quietly in Padmasana, Vajrasana or Sukhasana.
- (2) Put palms of both hands on your knees.
- (3) Make tip of the first finger touch that of the thumb, with natural little pressure and keep the remaining fingers Madhyama (middle finger) Anamika (third finger) and Kanishthika (fourth finger) straight and erect. Then arranging on knees Gyan Mudra is formed according to the figure.

##### Benefits :

- (1) Nerves of the brain are activated. Keeps mind quiet. Knowledge develops.
- (2) Concentration, memory-power and delight increase.
- (3) Spirituality, strength of Snayumandal and progress in meditation are achieved.



#### 2. Pruthvi Mudra :

##### Position :

- (1) Sit quietly in mudrasana.
- (2) Place palms of both hands on knees.
- (3) Bend Anamika (third finger) towards palms. Press your thumb on parva and the remaining three fingers Tarjani, Madhyana and hand Kanishthika erect. Arrange them on knees Pruthvimudra is formed as per the figure.

##### Benefits :

- (1) Weakness of the body is removed. Fatness reduces. Weight is balanced.
- (2) Digestive power, energy-power and Sattvik qualities are developed.
- (3) Body gains energy, smartness and brightness.



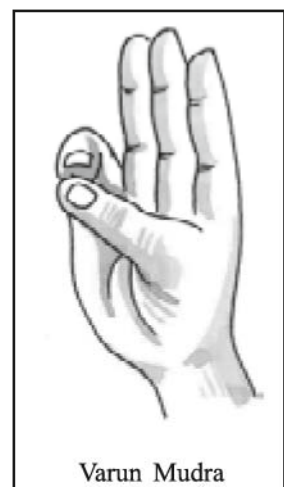
#### 3. Varun Mudra :

##### Position :

- (1) Sit quietly in Aasana.
- (2) Place palms of both hands on knees.
- (3) Keep Kanishthika and thumb joined and the remaining three fingers Tarjani, Madhyama and Anamika erect. Arrange them on knees as shown in the figure. This forms Varun Mudra.

##### Benefits :

- (1) Jaliya portion grows in body.
- (2) Body becomes oily. Skin becomes beautiful and soft.
- (3) Diseases caused through the deficiency of Jaltatva get recovered. It gives relief in diseases of heat.



#### 4. Soorya Mudra :

##### Position :

- (1) Sit quietly in Siddhasana.
- (2) Place palms of both hands on knees.
- (3) Keep Anamika of both hands on Mool (मूल) of thumb. Place thumb and keep pressing. Arrange the remaining three fingers Tarjani, Madhyama and Kanishthika on knees. This gives Soorya Mudra according to the figure.

##### Benefits :

- (1) Strength of the body increases, body becomes energetic.
- (2) Digestion power increases, Fatness is reduced. Proportion of cold in the body decreases. The body becomes free from Vayudosh.
- (3) Cholesterol element decreases in the blood. Relief in diseases of the liver.



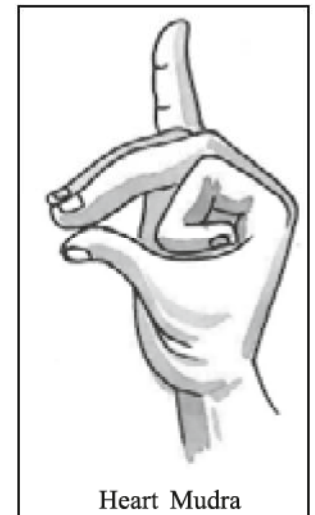
#### 5. Heart Mudra :

##### Position :

- (1) Sit quietly in any Mudrasana.
- (2) Place palms of both hands on knees.
- (3) Join Madhyama and Anamika with the thumb and bend tarjani in root of the thumb. Arrange Kanishthika erect on knees according to the figure. This gives heart Mudra.

##### Benefits :

- (1) The heart becomes active and efficient.
- (2) It is useful in obstinate diseases like asthma.
- (3) It gives much relief in diseases pertaining to the heart, chest and blood.



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Asanas are performed only for physical health, They are incomplete thinking. Main aim of Asana is - stability, concentration and purity of mind.' This is only possible when a person performs Asana regularly. Maharshi Patanjali Stated for result of Asana ततो द्वन्द्वानभिधानः । There will be no shocking to duel.

Rajogun is disappeared and Sattvagun is developed due to performing Aasana. A person becomes physically, mentally and emotionally pure. Over and above, more important quality is spiritual development.

#### Useful Suggestions for Yogabhyas - Yoga-study :

- It is best to perform Asana in the morning or twilight.
- Asana should be performed after passing the stools (faeces) i.e. after the discharge of excreta and with empty stomach. Asana should be done after half an hour of taking any type of liquid and after taking meal it should be done after four hours.
- Before performing Asanas, the Yogic rotation of organs, should be done. After performing Asana Shavasana should be performed for five minutes and make body and mind clam.
- Perform the Asana on a carpet, and there will be a cotton soft piece on it. If there is a wool carpet, it will be good. The land for Asana should be in level and stable.
- To perform Yoga study, proper cotton clothes should be put on. The things which may produce injuries should be removed (i.e. wrist watch, ring, chain, socks, belt etc.)
- The numbers and time of Asana should be increased slowly and as per capacity.
- Asanas should be practised regularly as per individual capacity, without jerks, slowly, rhythmically, without any enforcement by keeping positive attitude.
- The body position is important as well as breathing i.e. breathe in, retain the breath and exhale is also important to perform Asanas.
- After performing Asanas, Shavasana or Makarosana should be performed two minutes for rest.
- After performing the Asanas, the meal should not be taken before half an hour and light refreshment should not be taken before 10 minutes.
- Immediately after performing the Asanas, one should not do strenuous exercise.
- After performing any Asana, its supplementary Asana should be performed.
- Yoga is a subject for study, so one has to study more for teaching.
- Yoga is not demonstrative activities, but it is life behaviour subject.
- A loin-cloth or under garments should be put on during Asanas.
- Women should not perform Asanas during the menstruation period. During the pregnancy they should not perform the Asanas. After the delivery period for three months they should not perform the Asanas.
- Asanas should not be performed where there is a speedy wind.
- Fragrant flowers and incense stick should be used during Asanas for being delighted.
- The series of Asanas should be simple to difficult.



### **Baddha Padmasana**

This Asana is being done in sitting position, Sit in a Padmasana position, bind the Padmasana with two hands. This Asana is called 'Buddha Padmasana.

#### **Basic Position :**

Keep both the legs straight, knees touch the ground, both heels of feet and toes of feet should be attached, hands are straight from elbows, put them near both sides, keep palms on the ground, keep fingers closed with each other, body from waist should be erected and in loose condition.



#### **Method :**

- Hold the left toe with the right hand, bend the leg from the knee, put the left toe on the right thigh.
- Hold the right toe with the left hand, bend the leg from the knee, put the right toe on the left thigh. The heels must touch the lower part of the abdomen.
- Then move the arms behind the back. Hold the toes with respective hands.
- Stay in this posture for some time, then for coming in basic position, leave the toe of leg side foot. Put the left hand in side.
- Leave the toe of right side foot, put the right hand in side.
- Straighten the right leg.
- Straighten the left leg.

#### **Things to bear in mind :**

- While doing this Asanas, concentration should be on breathing.
- Do this Asana with stable mind, quietly.

#### **Benefits :**

- Gives relief in constipation.
- Indigestion trouble will be removed.
- Gets rid of viral bacterial diseases.
- Removal of pain of shoulders, elbows, knees.

### **Vajrasana**

There is a word VAJRA in Sanskrit. It is used for man's organ of reproduction. This Asana affects on the lower part of abdomen, so it is called vajrasana.

#### **Basic Positon :**

Keep both the legs straight, knees touch the ground, heels of the feet and toes of the feet are closer. Keep hands straight from elbow, put them to both sides of legs. Keep palms on the land, Then sit in a position shown in the picture.



**Method :**

- Bend the left and right legs from the knee and put it under the buttocks.
- Put the left hand on left knee and right hand on right knee.
- Close the eyes.
- Keep this position for a few minutes, open the eyes for coming in basic position.
  - Put both the hands on the ground, side way.
  - Bring the right hand in front and make it straight.
  - Bring the left hand in front and make it straight.

**Things to bear in mind :**

- Keep the place for Yoga study clean.
- Make determination that body and mind become like Vajra
- Remember the powerful great men.

**Benefits :**

- This is only Asana that can be done after taking meal.
- Improves the digestion.
- The calf-muscles and legs become strong.
- The knee muscles become flexible.

**Supta Vajrasana**

This Asana is being done in sitting position. In coming of Vajrasana position, one has to lie down on back, so it is called Supta Vajrasana.

**Basic Positon :**

Keep both the legs straight, keep knees touching the ground, keep heels of the feet and toes of the feet closer. Keep hands straight from elbow, put them to both the sides of legs, keep palms on the ground, fingers of the hands attacked each other, the body from waist should be erected and in loose position.

**Method :**

- Bend the left leg from the knee and put it under the buttocks.
- Bend the right leg from the knee and put it under the buttocks.
- Lie down on the back, with the support of hands.
- Put both the hands under the head.
- Keep this position for some times, for coming in basic position

- put both the hands on side.
- Sit up slowly with the help of hands.
- Straighten the right leg.
- Straighten the left leg.

**Things to bear in mind :**

- This Asana can be done after taking meal.
- During pregnancy period, women should not perform this Asana.
- During lie down on the back, go slowly with the help of elbows.
- After enough practice of Vajrasana, this Asana can be performed.

**Benefits :**

- A spinal cord bends behind so a hump is removed.
- Flexibility of spinal cord is increased.
- Muscles of face and head are developed.
- There is relief in thyroid.
- It affects on pancreas. It gives the relief in diabetic trouble.
- Digestive system becomes active.
- Number of white cells increase, so immunity increases more.
- This Asana is useful to the students who sleep more.

**Sinhasana**

In this Asana the scene of the mouth is similar to the open mouth of a lion, so it is called Sinhasana.

**Method :**

- Sit with extended legs.
- Bend the right leg from knee, put it under the left buttock, put the left buttock on the sole of foot of left buttock.
- As same put the left leg under the right buttock.
- Cross the ankles with each other. Put the legs in such a way that some part of soles and fingers can be seen behind.
- Put the hands on the respective knee. Keep the fingers of hand open, put them on the knees as claw of lion. Press a little both the hands, bend the body in front.
- Bend the head a little low, open the mouth full, bring the tongue out, as possible as you can.
- Keep the sight on tip of nose.
- Keep the abdomen in contraction.
- Make Appearance of face dangerous, breath powerful roaring from navel.



**Points to be kept in mind :**

- In the beginning, do Sinhasana for some seconds, after increasing practice, reach upto three minutes.
- Sit with forward bend in such a way that there will be no pressure on the ankles.
- Open mouth fully, bring tongue out completely.

**Benefits :**

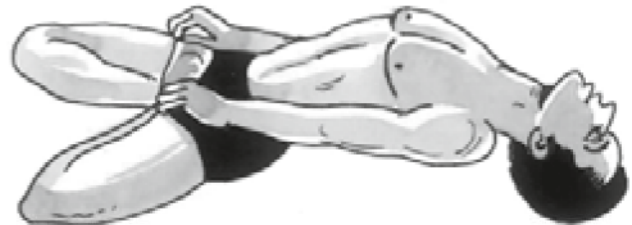
- Body becomes ready for Mulbandh, Uddiyanbandh and Jalandharbandh.
- This Asana is useful in stammering.
- The saliva gland of mouth becomes healthy and active.

**Matsyasana**

This Asana is being done on sleeping back. The shape of body becomes like a fish, so this Asana is called Matsyasana.

**Basic Positon :**

Sleep on the back, keep both the hands near knees, keep both the legs near to each other and straight from knee, palms to land side.

**Method :**

- Hold the toe of right leg with left hand and put it on the thigh of left leg.
- Hold the toe of left leg with right hand and put it on the thigh of riht leg.
- Put both the hands on land near the head, with the support of hands, lift waist - lift head, put the middle upper part of the head on the ground. knees remain with land touching.
- Hold the toes with hands. Try to touch the elbows to the land (complete position). Stay for some time in this position, then come in the basic position :
  - Release both the toes, put the hands near the body.
  - Put both the hands on land near the head, with the support of hands put the head in correct - systemetic position, put the waist on ground.
  - Straighten right leg.
  - Straighten left leg.

**Things to bear in mind :**

- This is a supplementary Asana of Halasana, Sarvangasana.
- Those who have trouble of spine, should take of the guidance of expert and then perform.

**Benefits :**

- Whole body becomes strong.
- There is improvement in breathing.
- Supportive for the development of chest and working of lungs.

- Stomach and intestines become clean.
- The pain of eyes, ear and head will be removed.
- Memory is increased.
- It is helpful in thyroid disease.

### **Sarvangasana**

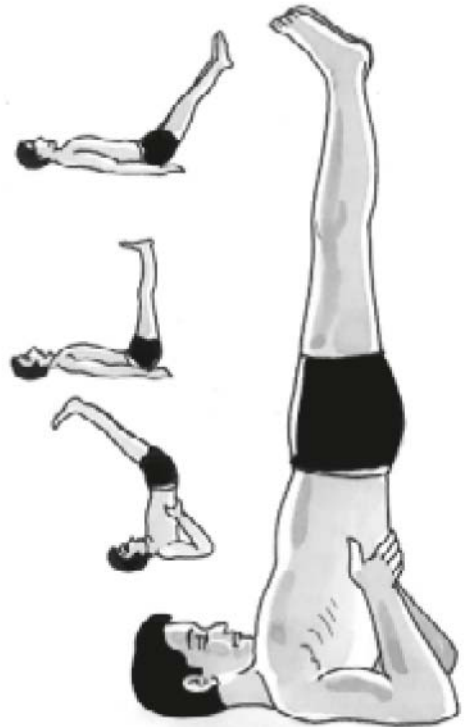
This Asana is being done by lying on the back. All organs of body will be good by doing this Asana. This Asana is for all the organs of our body, so that this Asana is called 'Sarvangasana'. Sarvangasana is called the king of all the Asanas.

#### **Basic Position :**

Lie on the back, put both the hands near the knees, put legs near to each other and straight from knees. Keep palms on ground side.

#### **Method :**

- Keep legs together and lie on the back. Keep both the legs straight, raise both the legs towards the sky slowly. Then bring both the legs over the head, so the body from sitting part will be raised. Now lift the hands from the land and put them on the waist, support the body. The support should be removed downward, straight the body so that legs will remain in upward direction, the body should be raised until chin touches the chest. Keep breathing speed normal.
- Raise both the legs upto 45° angle. Bring both the hands behind and put on the ground. Keep palms to upper side, do both actions simultaneously.
- Raise both the legs up to 90° angle. Bring both the hands forward and put on the land. Keep palms toward the land.
- Bring both the legs behind in such a way that both the legs will be parallel to shoulder and to waist part. The legs should not touch the ground.
- Raise the whole body from neck with the support of hands at waist part. Arrange the body with support of hands, in a straight line. (Complete Position).
- Stay for some time in this position, for coming in basic position :
  - Bring both the legs behind, parallel to land both the hands straight touching the land.
  - Bring both the legs in such a way that there will be 90° angle.
  - Bring both the legs in such a way that there will 45° angle. Bring both the hands behind, put on the land, palms toward the land.
  - Put both the legs on land. Bring both the hands in front, put them on the ground.





**Things to bear in mind :**

- The patient of heart disease should not perform this Asana.
- The patient of liver disease should not perform this Asana.

**Benefits :**

- The digestive power increases active, by performing this Asana daily.
- Body skin doesn't get loosened.
- Wrinkles are prevented.
- Mind and soul become pure.
- Power of eyes and mind is increased.
- This Asana is helpful in the diseases of indigestion, thyroid constipation, development of thyroid.

**Bhadrasana**

Bhadra means auspicious. This Asana is considered as auspicious.

**Method :**

- Sit with extended legs forward for this Asana. Put the soles of both the legs facing and touching each other with the help of hands, as salutation position. The legs will be in bending position from knees. Fingers of both hands should be joined to each other of both the hands, bring them under the toes, hold strongly toes of the legs with hands. Now bring both the legs slowly to near of the body. Try to bring them near and touch the 'Shivni' (the part between the anus and urinary canal). Keep the body erect, chest will come out. Press both the legs' knees on the ground. Keep the body erect completely and have normal breathing.

**Things to bear in mind :**

- Don't perform while illness.
- Keep such a position that the Asana can be performed without jerks. Improve upon the positions and get control over the Asana.

**Benefits :**

- Joints of legs and muscles become strong.
- A testicle and the excretory system become healthy.
- Fat of the inner part of thigh is decreased.
- Will power increases, intellectuality becomes sharp.
- This Asana is effective for the treatment of Piles, Fistulas in the anus.
- This Asana is beneficiary to tuberculosis, heart disease, sleeplessness and in many other diseases also.

## Utkatasana

'Ut' means upper and 'Kat' means buttock. In Utkatasana both buttocks are lifted up, so it is called Utkatasana.

### Method :

- For this Asanas, take a position on legs that it is in neither quite standing not quite sitting posture. Keep a distance of 45 cm between two legs.
- Keep both the hands on ground with their respective side.
- Raise both the heels, keep body supported on toes and support of hands. Lift heels so that heels make 45° angle with the ground.
- Put both hands to respective knee.
- Keep the fingers parallel with ground as shown in figure. Erect the body from waist. See in front. Whole body will be supported by toes.
- Stay for certain time then come in the basic position in the reverse order.



### Things to bear in mind :

- In the beginning, if you feel difficulty to keep the body stable on toes, take a support of both hands, hands keeping on the ground.
- Gradually, they can control over it after constant practice, then put the hands on knees.
- At the initial stage do this Asana for some seconds. After practice, perform the Asana for a minute.

### Benefits :

- This Asana is used in Yaugic Basti.
- Stability of body increases.
- Toes of feet become strong.

### Utkatasana (Second Manner)

### Method :

- Stand on a carpet.
- Raise the heels upto 45° angle.
- Bend both the legs from knees.
- Bend the body from waist, Erect the upper part of body from waist, keep the hands parallel to the ground. Keep palms towards the ground, raise hands in front.
- Hold the position for a suitable time and return basic position, slowly in the reverse order.

### Things to bear in mind :

- Both the hands and thighs should be parallel to the ground.
- Action of raising heels, action of lowering thigh and buttock, action of raising the hands should be done simultaneous.
- During this Asanas, attention should be concentrated to navel.

### Benefits :

- It increases the power of body-stability.
- Muscles of Hands and legs become strong.
- A waist become flexible. The fat deposited on the waist is removed.
- This Asana is useful to develop the physical and vital power-capacity.

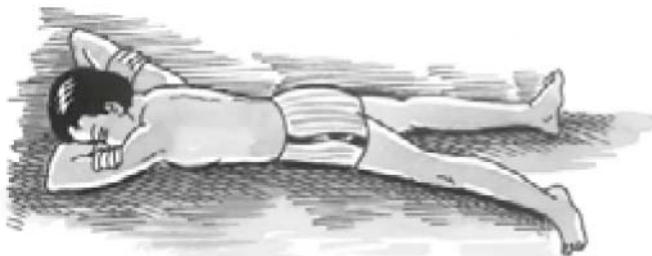


## Makarasana

Makar means crocodile. In this Asanas, Figure of the body is like a sleeping crocodile lying on the bank of a river.

### Method :

- Sleep on the stomach.
- Fold both hands with each other, put a head on it.
- Keep both the legs a part, heels are in inner side.



### Benefits :

- After performing the Asanas on chest, this Asana is useful for rest.
- Gas of abdomen is removed. Body gets sufficient rest.

### Duration :

According to one's ability.

## Trikonasana

This Asana is done in standing position. In this Asanas, a triangle is created of body, hence this Asana is called Trikonasana.

### Basic Positon :

Stand in an attention position (Keep both legs together). Keep both hands straight and attached with body. Sight should be infront. Fingers of hands should be attached with body.

### Method :

- Put left foot toward left side apart 1 m keep both the hands at shoulder level in a side direction. Palms should be at ground side both the actions should be done simultaneously.
- Keep left leg straight to left side, turn the right claw to little right side. Both the legs should be straight from knees.
- Breath out, bend the body to left side. Put the left hand on the left ankle or on the ground. Raise the right hand toward the sky from the right side. Both hands should be in one line, perpendicular to the land.
- Turn the head to right hand side, side should be on right hand (Complete Position).
- Hold this position for some time and turn the head for coming in basic position :
  - Come in an attention position, both the hands should be in shoulder level.
  - Turn the claws of feet and knees infront.
  - Keep left leg together with right leg, keep hands lower side and keep to side of body.



**Special :** This action should be done by right leg also.



**Things to bear in mind :**

- It is advisable that the persons having diseases should take guidance and advice.
- This Asana should not be done with jerk.
- Body should not bend in front or back side, but it should be bent sideward.

**Benefits :**

- Muscles of leg become strong.
- Diseases of neck and back are cured.
- Development of chest.
- It is useful to increase the height.
- Mental power increases, youth is maintained.
- The calf muscles and the knee become strong.

**EXERCISE****1. Describe the method of the following Asanas :**

- (1) Baddha Padmasana (2) Vajrasana (3) Sinhasana (4) Matsyasana (5) Sarvangasana  
(6) Bhadrasana (7) Utkatasana (8) Supta Vajrasana (9) Makarasana (10) Trikonasana.

**2. State the benefits of the following Asanas :**

- (1) Baddha Padmasana (2) Vajrasana (3) Sinhasana (4) Matsyasana (5) Sarvangasana  
(6) Bhadrasana (7) Utkatasana (8) Supta Vajrasana (9) Makarasana (10) Trikonasana.

**3. Write answers of the following questions by selecting correct option from the options given below :**

- (1) In which Asanas, the position of body becomes like a fish ?  
(A) Makarasana (B) Trikonasana (C) Matsyasana (D) Sinhasana
- (2) In which Asanas, the position of body becomes like a crocodile ?  
(A) Sarvangasana (B) Vajrasana (C) Utkatasana (D) Makarasana
- (3) In which Asanas, the shape of mouth becomes like a mouth of lion ?  
(A) Baddha Padmasana (B) Sinhasana (C) Makarasana (D) Trikonasana
- (4) Which Asana is being done by sleeping on back ?  
(A) Matsyasana (B) Vajrasana (C) Bhadrasana (D) Sinhasana
- (5) Which Asana is being done by sleeping on the abdomen ?  
(A) Sinhasana (B) Makarasana (C) Matsyasana (D) Baddha Padmasana
- (6) In which Asanas, body shape becomes Triangular shape ?  
(A) Bhadrasana (B) Utkatasana (C) Supta Vajrasana (D) Trikonasana
- (7) Which Asana is being done in sitting position ?  
(A) Baddha Padmasana (B) Matsyasana (C) Sargangasana (D) Makarasana

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### 1. When and how to do regular exercise ?

One who wants to remain healthy and free from disease, should always do exercise. Young and aged, poor and rich, woman and man, all should do exercise to remain free from disease and healthy and also to live the life along with good health, must do the exercise. The people living in all regions (hot region, cool region, humid region, highly raining region etc.) must do exercise. Not only this but those who are doing some bargainers and living sedentary life also should do exercise. Now, we shall get information regarding when and how to do the exercise, which is as follows :

#### When to do exercise ?

The following points should be kept in mind regarding, as to when the exercise should be done.

- (1) Exercise can be done either in the morning or in the evening.
- (2) Before doing the exercise in the morning, the morning physical cleanliness actions (like discharge of excreta) necessarily should be performed.
- (3) After completing the morning physical cleanliness actions, the dress suitable for an exercise should be put on.
- (4) Never do exercise without putting on the shoes. The shoes should be such that they can protect the legs. The shoes should be without heels.
- (5) Never do exercise with empty stomach. This does not mean that the stomach should be completely empty. Before doing an exercise one can take tea, coffee or little hot water.
- (6) Generally, exercise can be done after three hours of taking the food.
- (7) In the hot season, thin and open, cotton clothes should be put on and then the exercise should be done.
- (8) In cool season warm clothes, track suit etc. should be put on.
- (9) After doing an exercise, if there is sweat, a track suit should be put on so that one can not suffer from the cold.
- (10) After the exercise when heart beats become normal, one can drink the water and one can have the break fast too.

#### How to do exercise ?

- (1) If one is suffering from tuberculosis, inactiveness of pancreas or any other disease, he should take the advice of a doctor and have physical check-up, before doing any exercise.
- (2) An exercise can be had in the form of daily works of the home and outside labour works.
- (3) An exercise can be with an equipment or without an equipment.
- (4) An exercise can be in the standing position, sitting position or in the sleeping (inprone position or sleeping on the back position) position.
- (5) An exercise can be that of the head, neck, the joints of the body, hands, legs etc. jumping or agility exercises include at most all the parts of the body.
- (6) An exercise can be that of walking, jogging, running, jumping, ascending, descending, swimming or that of performing the skill of any of the games.
- (7) An exercise can be individual or in a group.

- (8) An exercise should be done in such an atmosphere that one can get pure air.

After doing any exercise, one should try to experience and observe as to how the body responds to an exercise, how the body adjusts to it and how the body accepts it. This type of experience and observation shall help in taking the decision regarding the load of exercise to be given to the body.

## **2. What is meant about an Exercise ?**

In simple language, an exercise means the bodily movements or the physical movements being done by different physical activities. Thus, exercises are the important actions for doing physical activities, or we can say that different actions of physical activities are in the form of exercises.

An exercise is a very important means or resource to know the effects on different systems of the body.

### **Effects of Exercise :**

- (1) As a result of effect of exercise on skeleton system, the bones of the body become strong, hard and heavy. The bones are not easily broken. The broken bones are easily repaired in short time. The mass of calcium increases in the bones. The red corpuscles increase in big quantity in the bone marrow of the bones.
- (2) The muscles of the muscular system become strong. The endurance power of muscles increases. The size of the muscles increases. The efficiency of supplying more oxygen to the muscles increases.
- (3) The working capacity of the heart in circulatory system increases, it means, the pumping of blood in bigger quantity in comparison with the normal condition, in one heart beat is seen i.e. the pumping efficiency increases. The quantity of haemoglobin increases in the blood. The efficiency to exchange the lactic acid and carbon dioxide in the blood, increases.
- (4) The efficiency of the lungs in respiratory system increases. The increase is seen in the aerobic capacity and anaerobic capacity and also in the vital capacity of an individual who does regular exercises.
- (5) The efficiency, to throw out the solid waste (excreta) by means of a big intestine in excretory system, liquid waste through the kidneys and the skin and the gaseous waste by means of the lungs, increases.
- (6) Other systems of the body become efficient.

## **3. General types of Exercise :**

In general types of exercise, the following are included.

(i) Walking exercise (ii) Swimming exercise (iii) Cycling exercise (iv) Rope Skipping exercise (v) Ascending and Descending the stair-case or the hill.

**(i) Walking Exercise :** Walking exercise is one of the good exercises for those; who are not able to play and probably not knowing cycling and also swimming too. As a matter of fact, walking is the best exercise, because all the systems of the body are in action at a time and also there is continuity of the actions of the systems of the body.

It shall be the best if an individual walks daily three to five kilometres continuously. In walking, one does not require any play ground or any equipment. For walking only a footpath is enough. The foot-path or any other walk-way should be levelled. It shall be suitable to put on heelless shoes while walking.

**(ii) Swimming Exercise :** For swimming, it shall be enough if a pond with no impurities in the water is there, or a river having slow flow of water. It shall be the best if a swimming pool is available for swimming. One who knows any of the methods of swimming only should take the risk of swimming in a pond or a river or a swimming pool.

Hands and legs get good exercise in the swimming. Breathing has got more importance in swimming, hence it increases the efficiency of lungs. Circulatory system also becomes efficient.



**(iii) Cycling Exercise :** The equipment for this exercise is bicycle. The path or a track for cycling should be levelled. The paths for cycling should be in the open air, because it requires more air while cycling. While cycling one has to hold the handles of the bicycle, which gives static exercise to the hands. The type of this exercise is called isometric exercise.

In cycling, the legs get maximum exercise. Mostly the quadriceps muscles (on the front side of the thighs) and the hamstring muscles (on the back side of the thighs) and also the calf muscles of the legs get maximum exercise. In the long distance cycling, the efficiency of the respiratory system and the circulatory system increases.

**(iv) Rope Skipping Exercise :** No special ground is required for rope skipping exercise. This exercise can be done in a room of a house or a little levelled space outside the house is enough.

The equipment required is a rope with handles at the ends of a rope. The length of a rope should be almost double the height of an individual. It is a jogging exercise with a rope.

The legs and the hands get good exercise. Since, one has to toss the body on both the palms of the legs, the tossing power of the legs increases, which is useful in the activity of high jump. Since, along with the jumping on the legs, the hands' round movement along with a rope requires more co-ordination, which develops one of the motor components i.e. the component of co-ordination of the body.

**(v) Ascending and descending the staircase or the hill :**

One gets more fatigue in climbing the steps of a staircase. By research it has been found out that the energy consumed in climbing one step is equal to the energy consumed in walking the straight distance fifteen times the height of one step.

Almost the similar exercise is that of ascending the hill. While ascending one has to lean a little on the front side. While leaning in front the length of the step becomes less. While leaning in the front the extensor muscles of the back become active, which have to use more energy.

Thus, while ascending and descending the staircase or the hill, the muscles of the back and the muscles of the legs become stronger. The respiratory system and the circulatory system also become efficient.

**4. Warm-up exercises while taking part in sports and games :**

Before doing any physical activity or taking part in coaching, training or a specific sports activity, it is necessary to do effective warm-up exercises. The warm-up programme can be for 5 to 15 minutes. Warm-up exercises should be done with less intensity, less strength and less speed. The repetitions of the exercise should be in accordance with the type of the game. They can be more or less. In doing such warm-up exercises, the circulatory system becomes active and makes the blood circulating in all parts of the body. The stretching exercises are an important part of warm-up programme, which helps in developing the flexibility of the body. Stretching exercises decrease the tension and the pressure of the minds of the players. Some years before, only the calisthenic exercises were considered important, but now, the stretching exercises are found more advantageous. Hence, they have become popular.

For most of the games, the following points can be included in the warm-up exercises :

- (1) For first 5 minutes do jogging on the spot or run with slow speed.
- (2) Then do the exercises for neck, wrists, shoulders, hands, waist, legs etc for 5 minutes.
- (3) Then do slow stretching exercises for 5 minutes in which stretching of the back, stretching of the trunk, stretching on the joint of the thigh i.e. ball and socket joint, stretching of the buttocks, stretching of the hamstring muscles (on the back side of the thigh), stretching of the quadriceps (on the front side of the thigh) and stretching of the calf muscles are included.

- (4) The stretching positions on the respective muscles should be kept for 10 seconds each. Never stretch abruptly. One should experience ease (rest) while the stretch.

#### **Proportions of Exercises :**

Taking into consideration the type of warm-up exercise, the proportions of the exercise can be had as under :

- (1) Jogging on the spot or running with slow speed - 5 minutes.
- (2) Exercises for head, shoulder, hands, waist, and legs - 5 minutes.
- (3) Stretching exercises - 5 minutes. Since, the stretching positions are to be hold for 10 seconds the time limit can be extended upto 7 minutes.

#### **Benefits of Exercise :**

Since the exercise is meant for whole of body, the benefits are for all the systems of the body. They are as under :

- (1) The bones of the body become strong, hard and heavy. In the case of fractures, the bones are repaired in short time.
- (2) The muscles become strong. The size of the muscles increases. The endurance power of the muscles increases.
- (3) The working efficiency of the heart increases. The heart pumps the blood in bigger quantity in one heart beat. Controls the systolic and diastolic pressures of the blood.
- (4) The efficiency of the lungs increases. The aerobic capacity, anaerobic capacity and the vital capacity of the lungs increases.
- (5) The secretion, of the hormones of the ductless glands increases.

#### **Necessity of exercise according to the game :**

- (1) In all most all the items of running, more oxygen is required. This requirement can be fulfilled only when the lungs' working is efficient. Lungs can be made more efficient by means of Pranayam activities.
- (2) In volley ball the legs and the hand should be strong. Hence, the exercises which can make the legs and hands strong, should be done.
- (3) There is much more use of the legs in foot ball game. Hence, the exercises which can make the bones and the muscles strong, should be done.
- (4) In basket ball and hockey games, the legs and the hands are in much more use. So, to make them strong, the suitable exercises should be done.
- (5) For the game of kho-kho the legs and the lungs should be strong. Hence, to make them strong, the suitable exercises should be done.
- (6) For the game of kabaddi, the hands, legs and the lungs should be strong. Hence, their suitable exercises should be done.
- (7) For weight-lifting, the wrists of the hands, waist and the legs should be strong. Hence, to make them stronger, the suitable exercises should be done.
- (8) For the game of Badminton, the legs and the shoulders should be strong. Hence, the suitable exercises should be done.
- (9) For the game of cricket, the hands and legs should be strong. Hence, the suitable exercises to make them strong should be done.

Here, the information regarding the games which are popular, has been given. But to take in to consideration the skills of these games, the specific exercises in view of the skills also should be done.

#### **5. Main Components of Individual Health :**

The components are as follows :

- (i) The evidences of the physical health of Human beings.
- (ii) The impression of the family, relatives and the friend circle.

- (iii) Food of proper type and in proper proportion
- (iv) Physical Health
- (v) Mental Health.

Now we shall get detailed information regarding these components.

**(i) The evidences of the Physical Health of Human - beings :**

The main evidence of the physical health of a human being is the heredity of his parents. Suppose an individual has not got the hereditary disease, but he has not got nutritive food from the childhood, he shall not be physically healthy. If such a child does not get nutritive and balanced food even in his young age and if in his life he has not done any lat physical labour or any type of exercise, it is possible that he shall be very weak from the view point of his health.

Suppose, an individual has got good food, but if his thoughts and the way of life is not proper, it shall have an adverse effect on his health.

Suppose, there is no discipline, regularity and control in the way of his life, it may have adverse effect on his health, which ultimately may give birth to various diseases.

Even if, an individual is not steady in his thoughts and understanding, it may have adverse effect in his life, creating transience (අවමැදිකම) in his thoughts. He can not steadily think, as a result of which the mental diseases like disturbance, impatience and mental tension remain in his life for ever.

An individual having balanced diet, way of life and thoughts is supposed to have good physical health.

**(ii) The impression of family, relatives and the friend-circle :**

The members of a family, relatives and the friend-circle always shall have good physical health; who are united, their social circle is cultured, disciplined, always with each other in good or bad circumstances, always thinking good about others and creating an atmosphere of culture.

**(iii) Food of proper type and proper proportion :**

Generally, good physical health depends upon the type of food and its proportion.

**(a) Proper food :** The food in which all the constituents of food are included is called proper food.

They are as follows :

- (1) Carbohydrates
- (2) Proteins
- (3) Fats
- (4) Vitamins
- (5) Salts (minerals)
- (6) Water.

We are taking these constituents in different forms. The main constituents are carbohydrates, proteins and fats. They evolve different calories from such foods. One gram of carbohydrate supplies 4 kilo calories. Similarly one gram of protein also supplies 4 kilo calories, but one gram of fat supplies 9 kilo calories. Calorie is a unit of heat or energy.

Vitamins and minerals (salts) do not supply energy but they play important role in the regulation of several essential matabolic processes in the body and help in the utilisation of the main three constituents.

Water is a unique vehicle of chemical transport and the medium in which practically all metabolic reactions take place.

In our daily food, all the six constituents should be included according to the requirement to keep good physical health.

**(b) Proper Proportion of Food :** Proper proportion of food can be different according to the age. This proportion can be known from the requirement of the calories necessary for a day.

The daily requirement of the calories from a six months child to different age groups is shown in the following table :

Sr. No.	Age : Months/Years	Necessary Daily Calories
1.	6 months child	118
2.	7 to 12 months child	108
3.	1 to 3 years child	1125
4.	4 to 6 years child	1600
5.	7 to 9 years child	1925
6.	10 to 12 years Boy Girl	2150 1950
7.	13 to 15 years Boy Girl	2400 2050
8.	16 to 18 years Boy Girl	2600 2050
9.	Above 19 years (A) Sedentary persons Man Woman (B) Persons doing less labour Man Woman (C) Persons doing more labour including active players Man Woman	2350 1800 2700 2100 3200 2450

**(iv) Physical Health :**

Different parts of the body and the sustems of the body, when are found, properly and efficiently working, it reflects that the physical health of an individual is good. Such healthy body conveys that an individual is -

- (1) Powerful
- (2) His posture is good.



- (3) Taking into consideration the age and height his weight is proportionate.
- (4) All the parts of his body are working properly.
- (5) His skin is smooth and clean.
- (6) His eyes are shining and bright.
- (7) His respiration is regular.
- (8) His liking for the food is good.
- (9) His sleep is enough.

Over and above the points shown above, for the maintenance of physical health, an individual shall have to take necessary steps like maintenance of health taking proper food, doing the exercise, avoiding bad-habits, to take responsible decision regarding sex, to remain alert about the symptoms of the diseases, to have medical check-up regularly, to take necessary steps to prevent injuries etc.

**(v) Mental Health :**

The contribution of the effects of mental components over physical health is very important. In these components, the effects of motivation, intelligence, emotional stability etc. are important. In the context of mental fitness, the difference is seen in the level of physical health of all the individuals. Since, the anxiety creates tension over the mind, it is harmful for physical health. The direct or indirect effects of the above mental components are seen over the physical health of an individual. Even then, that individual is mentally healthy -

- (1) who has control over emotions.
- (2) who is sensible for the necessities of others.
- (3) one who is free from unnecessary mental tension, anxieties and uneasiness.
- (4) one who is confident about his capability.

### **EXERCISE**

**1. Give answers of the following questions in detail :**

- (1) What shall you keep in mind before doing regular exercise ?
- (2) Explain, what is meant by an exercise.
- (3) Show the types of general exercises and give the understanding regarding any two of them.
- (4) Give an understanding regarding the warm-up exercises to be done while taking part in the game.
- (5) Show the main components of physical health and give an understanding regarding any two of them.

**2. Answer the following questions in short :**

- (1) Give understanding of physical health.
- (2) Give understanding of mental health.
- (3) Give understanding as to what is the proper food ?



- (4) Explain, what should be the impression of a family, relatives and friend-circle regarding individual health.
- (5) Explain the benefits of exercise.

**3. Write answers to the following questions by selecting correct option from the options given bellow :**

**(1) What is necessary to do before doing exercise ?**

- (A) To take food
- (B) To put on any clothes
- (C) Morning physical cleanlinss actions
- (D) Drinking the stimulating drink

**(2) What is the effect of exercise on muscles ?**

- (A) Muscles become loose
- (B) Muscles become strong
- (C) Muscles pulled
- (D) Mucles become weak

**(3) After what time of taking the food exercise should be done ?**

- (A) After one hour
- (B) Immediately after taking food
- (C) After three hours
- (D) After two hours

**(4) How many constituents are there for food ?**

- (A) Four
- (B) Eight
- (C) Five
- (D) Six

**(5) From which constituent maximum calorie is achieved ?**

- (A) Carbohydrates
- (B) Proteins
- (C) Fats
- (D) Salts (minerals)

**(6) From 1 gram carbohydrate substance, how many calories or energy is achieved ?**

- (A) 3 calorie
- (B) 4 calorie
- (C) 5 calorie
- (D) 6 calorie

**(7) From 1 gram fatty substance how many calories or energy is achieved ?**

- (A) 4 calorie
- (B) 7 calorie
- (C) 9 calorie
- (D) 11 calorie

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Atmosphere on all sides around us, in which are contained air and water, is called environment. Air and water, both these components are essential for human life. On the world, organisms like many animal, birds, insects, vegetation over and above man live in it. The particles, flowing or still water, form, mountains, rivers etc. are also a part of this environment. The industries factories, chemical substances, smoke, noise and advantage and disadvantage of these are also part of his environment.

**Water :**

We all know that water is obtained from clouds in the form of rain. Springs and rivers flowing down from mountains are also formed by rain water. Water formed by melting of ice on high snow-covered mountains also flows in the same rivers. Over and above, the raining water is also stored in places of water - like pond lake. Underground water is stored in wells, step-wells. Large oceans surrounding the vast portion of the earth give an idea of quantity of water contained in the environment. Water on the surface forms clouds from water vapour through evaporation. It again comes down in the form of rain.

**Pollution of Water :**

Water is essential for human existence. It is essential for health to get pure water. Rain water is mostly on the top in purity. Some times when polluted gases from air mix with rain, rain water can be polluted. But we, man, polluted the water more. Industrial garbage enter into water and water becomes polluted. This polluted water passes in rivers, lakes etc. The lakes which are situated on the earth, people live in this area, villages, cities, corporations. Which are situated on these rivers, all are affected of many diseases. Thus water pollution is increased due to mixed excretion, industrial solid and liquid rubbish with water. These pollution should be stopped for the existence of all living creatures on the earth.

**Factors Polluting Water :**

The fear which was never before of water being polluted due to industrial garbage has increased over the last 30 years. Poisonous chemicals, radioactive substances, offensive small spreading substances mix with water, so it becomes polluted and it is not potable water. But where there is non-availability of potable water, people take such polluted water in order to sustain life any how. As a result, they gain many diseases and it may result in death also.

Due to excreta of men and other animals mixed with water the pollution spread out. Drinking such water, various bacteria and viruses enter the human body. Healthy man then becomes a victim of diseases like cholera, typhoid, jaundice and diarrhoea. If there is no suitable treatment of the diseases, it may result in death also. It is seen, where there is non-availability of potable water in industrial area, cities, - corporation area there is high rate of polluted water diseases and death rate is also high.

### **Purification of Water :**

We have seen that the polluted water causes many diseases. So polluted water should not be taken. This understanding is true but incomplete. Water which appears pure also can be polluted. The pollution of original source of water is responsible.

Impurities should not mix in water during transit from its original source. Hence it needs to be taken care of. It is very necessary that the original source - river, well, lake, pond and connecting water pipes, drain, pots, tanks etc. may be perfectly protected in order that pure water from the original source may reach the source of its use.

### **Methods of Maintaining Pure Water :**

It is said 'Water is life'. To drink water is essential for all living creatures on earth including men to sustain their life. If there is a polluted drinking water, then they become victim to many diseases and their life ends early. Hence, the following details should be borne in mind in order that water may not get polluted and it becomes pure.

### **Individual Cleanliness :**

Vessels which are used for drinking water at our home, i.e. pots, metal pots, hand lifter (doyo) for taking water, drinking glasses should be washed daily. If these vessels are not clean, impurities may mix with water. Impurities like dust particles, dirt or soil that can be filtered etc. should be removed. Water should be used after filtration, for filtration a piece of cloth or plastic net filter can be used.

When water comes in contact with hands or body, nail-dirt, hair and dirt, it gets polluted. So the care should be taken. After passing stool and urine hands should be washed with soap. The place for accumulation of water or water - closet should be kept clean. There should not be water on the place for accumulation of water, that place should be dried by wiping out water. Doing this, there will not be hazards of mosquito. As far as possible there will be a separate glass for each member of the family. Water should be drunk with up-lifted mouth, after drinking the water, glass should be cleaned. This is good for health. The good habit is to take water with doyo. A good habit should be developed from childhood. There will be pipe under the pot or water-vessel, taking water from the pipe is healthy manner.

### **Application of Knowledge :**

We, many a times, in spite of knowing, behave as ignorant. If water is kept uncovered, dirt, dust-particles, leaves etc. may fall in it and water becomes polluted. So water vessel should be covered. If there is a well, it should also be covered. So dust particles, rubbish may not fall in it and water will be pure. Before using the well-water, water should be filtered by a piece of cloth. Due to the knowledge of purification of water and application of it, the diseases will be away and body will be healthy.

## **Health Education :**

All persons in the family and especially children should be imparted such education so that they may be aware of purity of water. Elders should behave in such a way that good habits developed in children. Children follow elder's behaviour, so elder's behaviour for purification of water should be ideal for children. When children go to school, it is necessary to give them education of basic need. Teachers should provide pure water to the children. Children should be educated for pure water and put an ideal model for health education.

## **Methods of Purification of Water :**

It is essential for the health that the potable water should be free from insect. There is water purification plant launched in big cities for purifying water. Purified water is supplied to the citizen. Filtration of water, decantation and application of insecticides like chlorine as well as mixing of alum are the main system for villages and small cities. Some time, pipes which supply water, are splitted or break, polluted water mix with pure water and it becomes impure. So it is necessary, the pipes should be in a good condition, old pipes should be replaced. The following methods are used with the purpose of using only pure water for drinking.

**(1) Decantation :** This method is very useful in rural and urban areas, to prepare purified water with out expenditure. Water should be kept still in the vessel for some time, so that impurities like soil, dust particles and dirt in the water settle down at the bottom, while light weight rubbish, such as leaves, grass etc. float over surface. Those can be removed by filtration using piece of cloth. This method is simple, it need not any expense. However, its use is also necessary before purifying water with substances like chlorine. Effectiveness of insecticide like chlorine reduces turbidity of water to a great extent.

**(2) Filtration of Water :** As heavy impurities settle down at the bottom, keeping water still for some time, light rubbish like grass, leaves etc. float on water. Such rubbish floating on the surface can be removed by filtration. Clean piece of cloth duly washed or plastic net should be used for this purpose.

**(3) Water Purification by Mixing Alum :** Alum has the characteristic of purification of water. Mistresses of house use Alum in rural and urban area. Municipalities in urban area also use Alum for purification of water.

**(4) Filtration Bed of Earthen Substances :** Water of well-stepwell is being purified by Filtration bed. But three earthen pots method is used for home. In this method, there are thee pots, in the most upper pot there is water, from this pot, water fall drop by drop in its below pot. This pot is filled by sand. Water passes through this sand and gets collected in bottom pot. There are pieces of stone in small and medium size water pass through them. Water is collected in a vessel, this is pure water.

**(5) Disinfectants :** Water which is not turbid (muddy) is made free of bacteria by adding disinfectants. Chlorine and likewise disinfectants (Potassium Permanganate, hypochlorate etc.) are used thus. Bleaching powder is used at village level for medium sized tanks. If bleaching powder is directly mixed with water, it contains lime. Hence if bleaching powder is mixed in bucket water and then allowed to decant, lime part settles down at the bottom. Water on upper part contains chlorine. This water on upper part is mixed with water in the reservior tank according to need.



Bleaching powder contains 30 to 40% active chlorine in ordinary circumstances. As time passes, quantity of chlorine goes on reducing. If the bleaching powder is good and fresh, 2.5 gm bleaching powder provides sufficient chlorine for 1000 litres of water. Measure of one empty matchbox is taken for this purpose in villages. It is approximately 2.5 gm bleaching powder. Chlorine tablets are available in the market for household use over and above chlorine gas and bleaching powder. Bottles of such tablets of 0.5 gm or 1 gm are available. How to use them is written on the bottle.

**(6) Boiling :** Boiling destroys various bacteria and viruses contained in water. Boiled water is allowed to cool and then kept in a clean reservoir. Then it is the best. Many people use this water for religious and cultural reasons in our country. In case of epidemic and gastroenteritis spread, water should be boiled and then used.

**(7) Purification of Water by Filter and Violet Rays :** There are various methods of purification of water with scientific research. Now we get purified water, purified in the machine, water purified by R.O. System.

**(8) Drinking Water from Sea-Water :**

Where there is non availability of pure water, there they purify sea-water, convert it into drinking water. If man will not use pure water in modesty, then in future, where there is a scarcity of drinking water. They have to start industries for making sea-water drinkable water.

**Garbage Hazards :**

It is bad habit, throwing rubbish or making its heaps near one's neighbour's house or public road. Industrial units produce rubbish, rubbish of synthetic garbage, pieces of cloth or plastic, papers, iron rubbish, rotted grain, chemicals of industries, chemicals are harmful to environment. They invite diseases. The carelessness toward cleanliness invites many diseases.

**Disposal of Garbage :**

There are rotted vegetables, leaving of food, solid garbage, dry garbage, green garbage etc. as well as rubbish accumulated on roads and streets. This garbage is collected in wheel-barrow, dustbins, in ox-cart by sweepers, and make it burnt or it is converted into manure. But if there is no proper arrangement for disposal of garbage, then the insects develop in it. Hot and humid weather makes this process quick.

Each house needs dustbin. Dustbin should be covered, otherwise insects enter in it and diseases will be spread out. Rubbish should be carried away daily.

**Methods of Disposal of Garbage :**

**(1) Collection of Garbage :** Garbage and rubbish can be used to fill in low level land. In cities like. Mumbai, garbage is now used in filling sea and thereby new land is prepared. After making the land hard by collection of garbage. New land is prepared, it is used for human residence.

**(2) Manure from Garbage :** If organic elements in the rubbish are decomposed with help of bacteria and fungi, useless rubbish can be transformed into manure. First, solid rubbish like pieces of glass or metal need to be separated for such a plan. The place for making manure should be far away from human residence.

**(3) Burning of Garbage :** When garbage is harmful to human health, the rubbish is burnt. Excreta of patients in the hospital, clothes wet with blood, cotton, bandages etc. are collected and burnt.

A machinery completely closed is used for burning substances which are harmful to mankind, so that bacteria and viruses are completely destroyed. This is called incineration i.e. complete combustion. Every individual carrying such garbage which is harmful to health needs to put on hand gloves and mask and full clothes covering the body.

Vehicles carrying garbage and rubbish should be fully covered. That is decency and at the same time it is essential to prevent spreading of rubbish and diseases through it.

### **Disposal of Excreta :**

There is no latrine-bathroom to each family due to poverty and crowded residence. So they use to go to open in air for excreta. Excreta are responsible for spread and growth of many bacteria and insects in hot and humid weather. Worms in the excreta can enter into the body through skin of the bare footed person. Other types of worms enter into alimentary canal.

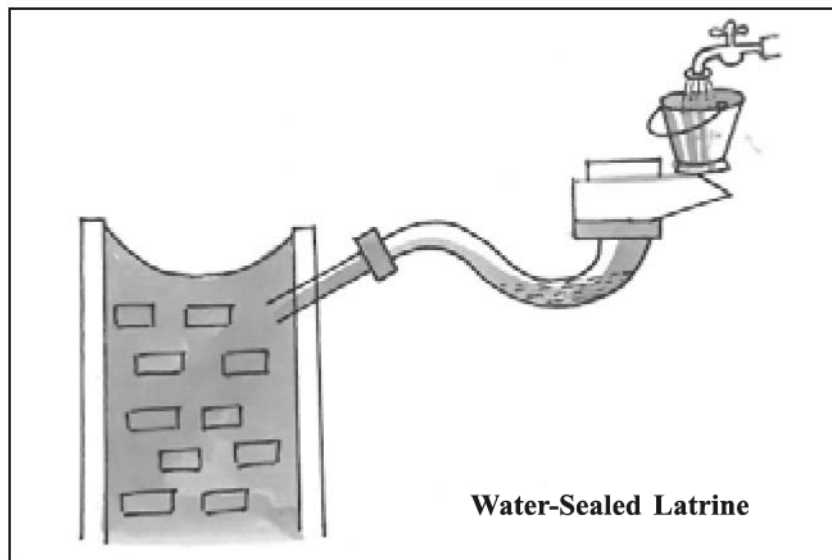
**(1) Non-Hygienic Ways :** To pass excreta on the bank of river or lake is dangerous for public health. If pits are dug for collecting excreta and Kacha latrines are made, it is necessary to make partition wall of cloth, jute, thin sheets of metal, or any other way for maintaining personal privacy. It should be looked after that the seat of such Kacha latrine may not collapse down. Growth of insects should be stopped by covering excreta in such pits with earth.

**(2) Hygienic Way :** The method of water - sealed latrine is considered the best for disposal of excreta in rural and urban population, where there is no drainage system.

### **Water - Sealed Latrines :**

In this type latrine is connected with excreta-pit dug. The upper end of pipe going to excreta-pit connected with the water-sealed latrine is such an arrangement that excreta is pushed by pouring water towards excreta-pit and excreta does not return towards latrine. Due to this, flies, cockroaches and other insects cannot be carried to excreta and thereby cannot be grown.

Excreta is decomposed in excreta-pit and after the pit is full, pipe carrying excreta can be carried to another excreta pit by moving the pipe in another direction. The pipe containing decomposed excreta is open after some time and its manure can be made use of.



Government encourages for such latrines and subsidy is also given for such schemes. The Safai Vidyalay of Ahmedabad in Gujarat has presented various designs, and thereby provided many options also under this scheme.

**Drainage System :** The low-cost of water sealed latrine or 'Shosh-Khada' becomes useful in small colonies or villages for disposal of human excreta. Such individual arrangements are difficult to maintain in cities due to dense population. Its solution is drainage system. This aim at total disposal of rubbish by connecting systems of latrines and urinals, made for disposal of excreta of residential places.

Organic part contained in the excreta decomposes in presence of oxygen. Some bacteria play an important role in this manner. Moreover, some bacteria also decompose in situation where there is even no oxygen. Thus through decomposition of organic part in both ways, harmful elements are converted in to simple chemicals like water, ammonia and in some proportion gases like methane. Thus the main aim of drainage system is to convert harmful part of complex organic substances into chemicals which can be of simple use through decomposition by bacteria.

Individual houses or units of other places are connected with pipe line and these pipe lines can carry such excreta / rubbish of streets into big gutter-lines. Such pipe lines become very large along with increasing flow and some times the pipes are so large that even a man can move easily inside. At last, this rubbish is carried to very far off places from human colonies to the complex drainage system.

The whole garbage - rubbish is called sewage. It contains human excreta, water disposal and rubbish or water disposal from kitchen, bathrooms. On increasing industrialization, such industrial units carry and empty the rubbish including chemicals in this sewage. If this sewage mixes with earth or water in the some form, it can cause many diseases. Hence, the main function of drainage system is to give it proper treatment.

### **Treatment of Sewage :**

Use of water in the whole of city comes to millions of litres many a time. Some times this water may fetch with it excreta or dead bodies of small animals or branches of trees from the lid having remained open in gutter lines. If the whole flow is first passed through iron net, rubbish of large size gets filtered through. It then becomes easy to lead the rest of the flow properly to decomposition.

This partly filtered flow is then passed through a long pipe of 10 to 20 mts such that the flow moves with an average speed of 30 cm per second. This helps heavy earth, stones or any such materials from the flow to settle down at the bottom. This solid heavy rubbish is frequently cleaned at the bottom with the help of machines.

Both the above processes, filtration and sedimentation respectively are simple physical processes. These processes make water free from heavy rubbish, which is worth filtering.

### **Special Treatment (Organic Waste) :**

Now mainly inflow of water with organic waste is important. That is mainly responsible for spread of diseases. At the end of the primary treatment and in the beginning of special treatment, water flow is entered slowly in a large water reservoir then water flows out of it at the other end. This work is done very slowly. All the solid rubbish settle down at the bottom as an important part of the process. Water used to flow at the speed of 30 cm per second in the sedimentation process. Here it flows at the speed of 30 or 50 cm per minute.

### **Treatment of organic Substances :**

Stream flowing very slowly from the sedimentation is passed through porous pipe. The flow is continuous like a fountain on the large earth surface below this pipe. Water of this fountain falls on a large pit 1 to 2 mts deep and 2 to 30 mts broad and which is full of small bits of stones.

Bacteria, sources like fungi and viruses etc. are accumulated on the surface during slow sprinkling of water and process of passing through stones. It helps in filtering and removing the harmful organic substances contained in this flow. Necessary oxygen also is available from air blowing in open for this work. Thus physical processes are tried in primary treatment and then organic process is used in this plant. This is a capable process. The flow passed through it is again carried to another lake of sedimentation where the water - settles down.

Nowadays other processes are made use of in place of this organic process of porous fountain and large pit of small stones. In this process, such a large land is not required. Time required is also short. Sludge as a residual solid rubbish at the end of the whole treatment is mixed with the steam from sedimentation tank, in this alternative arrangement. It is clear that this rubbish is full of various bacteria and hence it accelerates the rate of decomposition. This rubbish is stirred in a large tank, so that sufficient air mixes with it, Incoming water-flow, organic sledge being mixed and mixing of oxygen in air are the processes. In this refined method, if we compare, 10 hectare land is needed for sprinkling of water while only one hectare land is required in the process of decomposition by mixing sludge.



After decomposition by either of the two processes, the flow of water is passed through the second stage of water settlement. The flow detains here for two to three hours. It again separates the solid or floating rubbish. Here the rubbish of the second settlement tank is without odour, yet full of nitrogen phosphates and bacteria due to the process of organic decomposition. This can be used as the best manure. The same refuse is mixed with previous aeration tank utilizing oxygen - decomposition and further utilization.

Thus such residual solid waste is in tonnes. So its disposal is a problem in big cities. Disposal of Residual water after Removing solid waste (sledge) from Drain water flow.

There is a special system requiring precaution while disposing, waste-liquid in river or sea. There is possibility of harmful bacteria presented in waste liquid. Such liquid should be made bacteria free with the use of chlorine before it gets mixed with river water. This water can be alternatively used for irrigation. Sufficient land should be available for this. The type of produce should be keeping in view possible bacteria in water, so that its useful parts (fruits or leaves) may not come in direct contact with such waste water. Such basic, hygienic details should be taken into consideration.

#### **Other Alternatives :**

It is possible to pass the entire water-flow of drainage - scheme in sea, river or land without special treatment applied. Rubbish with bad odour mixed in sea may flow back to sea shore at the time of tide. River water becomes full of rubbish and flows downwards to bank - regions and spread bad odour and diseases. Its proper planning can reduce these disadvantages.

#### **Disposal of Excreta and Condition of Nation :**

Huge financial capital-fund is required for drainage system. If such a system is launched, its maintenance and repairs would require huge amount of money. It is necessary that gutter arrangement as an ideal should be launched everywhere. Even then, such a system is not prevalent in most of the country. Mostly, all of the villages are deprived of such facility in rural areas.

As per above condition, water - sealed latrines are the best solution. Over and above, good habits are also useful, i.e. after going to latrine and before taking food, hands should be washed with soap, and pure water. We will be safe from diseases due to such habits. For excreta, drainage system, water - sealed latrines and for solid waste compose pits are effective option and less expensive also.

#### **Gobar Gas Plant :**

Excreta of animals and other waste are used in Gobar Gas Plant. In this plant oxygen gas is absent and insects are present due to this and process of decomposition. Methane gas is produced, Methane will be 60% and inactive carbon dioxide will be 40%. There is Nitrogen sulphite also. In gobar gas, excreta of animals is the best raw material. In these excreta of man, pig, droppings of cock, hen are also added. For organic waste, stalks of Maize, leaves of plants, wild grass, rubbish of farm and moss are very useful for production of gobar gas. There is no decrease of quality of manure but it is increase. Thus both the aim, dung and manure are achieved.

There are different parts of gobar gas plants as under :

- (1) Foundation
- (2) Digester
- (3) Gas collection tank, gas holder
- (4) Place for Entering the raw material
- (5) Passage ditch
- (6) Exit valve for gobar gas, pipe line, water, trap, fittings.

#### **Family Gobar Gas Plant :**

It is necessary to build a plant of a capacity of 2-3 cubic meter for a family of 5-6 members under this family gobar gas plant. It need 2 to 3 cattles for one cubic meter gobar gas. The construction of family gobar gas plant is being done by Gujarat Agro industries corporation and Khadi Gram Udyog Bhawan.

The gobar gas plant for institution and community is bigger.

Institutional gobar gas plant is useful for residential school, residential institution, Trust etc. communal gobar gas plant is covered rural area or some urban area.

Village Panchayat or gobar gas co-operative society or concerned beneficiary are responsible for administration, maintenance and to take care of this plant.

#### **Method :**

First of all, dung is mixed with water. It is called slurry. This slurry is composed into digester. There is no oxygen in digester, so there is chemical catalysis in slurry and gas is produced. Gas is collected in gas holder. Slurry comes out from digester through pipe line and exit pit. Gobar gas is taken to kitchen, engine etc., from take through gas pipe line.

#### **Useful Statistics :**

When we pass dung and gobar from the gas plant, we receive gas for fuel and manure for land, on the other hand, if we do not pass dung from gas plant then we receive only one thing - dung, dung has flaming capacity 11 percent, gas has flaming capacity 60 percent.

A buffalo gives 15 kg dung daily. A cow gives 10 kg dung and a calf gives 5 kg dung. 0.037 cubic m (1.3 cubic foot) gas is produced from 1 kg dung. 0.028 cubic m (1 cubic foot) is produced from excreta of a man.

- 0.227 cubic m, 8 cubic foot gas is required for cooking per person / per day.
- 0.127 cubic m, 4.5 cubic foot gas is required for lightning / an hour / lamp c 100 candle power.

#### **Working and Maintenance of Gobar Gas Plant :**

When gobar gas plant is established and started to use, then, slurry should be filled up in digester. During filling, the following points should taken into notice.

**Filling the dung in the initial stage :**

- (1) There will not be dust, a small piece of stone in dung which is used in the plant. There will be only grass to rubbish, stalks etc. things other the outer pipe will be blocked.
- (2) Raw material should be filled up at a time, so that the gas which was produced from former slurry, will not be useless. The dung should be filled in at a certain level in the digester so that the gas which is produced will not mix in the atmosphere. It is desirable to pour a fresh dung in the digester so that fermentation process for producing gas will be speedy.
- (3) 2-4 buckets of ferment slurry of old plant should be added in the plant so there will be speedy process of producing gas. In the beginning state, this starting doze is helpful to supply the insects and gas producing process will be speedy.
- (4) When filling up the dung slurry work is finished, digester should be kept as it is for a week, During this period there will be fermentation in new slurry and gas will be produced in common rate. Once there is fermentation in digestery gobar gas will be produced regularly, at this stage use of gobar gas and daily activity of gobar gas plant is started.

**Daily Activities of Gobar Gas Plant :**

- (1) Fresh and clean dung should be filled in the gobar gas plant.
- (2) In the ratio of 1 : 1 mixer of dung and water should be filled in the gobar gas plant daily.
- (3) Dung and water mixer should be added in the plant so that we can get the gas in certain rate.
- (4) It is taken care during mixing dung and water, there will not be knot. When slurry becomes in a liquid form and then it will be filled in the plant.

Prepare slurry in mixer tank, let it be inactive for 10-15 minutes so the useless small substances will be in bottom part. Then slurry should be passed in disegestery and at last mixer tank will be cleaned so that dust and useless particles will be removed. When you put slurry first time, take care that the slurry should be put in similar rate to all sides.

**EXERCISE****1. Answer the following questions in detail :**

- (1) How is water polluted ?
- (2) State the method of water purification.
- (3) State the methods of Disposal of Garbage.
- (4) State the function of Gobar Gas Plant and give the information of its maintenance.

**2. Write short note :**

- (1) Garbage Hazards

- (2) Drainage System
- (3) Treatment of Sewage
- (4) Treatment of Organic Rubbish
- (5) Daily Working of Gobar Gas Plant.

**3. Write answers to the following questions by selecting correct option from the option given below :**

- (1) What is environment ?
  - (A) Useful cover to human world
  - (B) Useless cover to human world
  - (C) Purification of water
  - (D) Individual cleanliness
- (2) When to clean the water vessels ?
  - (A) Each second day
  - (B) Each third day
  - (C) Alternate day
  - (D) Daily
- (3) What type of water should be taken during vomiting - Diarrhoea diseases ?
  - (A) Cold water
  - (B) Warm water
  - (C) Boiled
  - (D) Recent filling
- (4) Which components are included in Garbage ?
  - (A) Human excreta
  - (B) Animal excreta
  - (C) Rubbish
  - (D) Liquid garbage
- (5) What is the best system for disposal of excreta, where there is no facility of drainage ?
  - (A) To pass excreta on the bank of river
  - (B) To pass excreta on the bank of pond
  - (C) To pass excreta in open air
  - (D) Water-sealed latrines
- (6) Which gas is not there in Gobar Gas ?
  - (A) Oxygen
  - (B) Methane
  - (C) Carbon dioxide
  - (D) Nitrogen

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Human resource is a valuable resource of the nation. In development of the nation people's health is very essential. Hence it is said that 'Fit people, Fit Nation' man has to do constant efforts in various ways in order to keep body and mind healthy. Pure air, water and nutritive (and nourishing) food (diet) are primary necessities of physical health. Moreover residence and atmosphere around should be clean. Man can live healthy life easily in favourable situation, but on not being adjustable to adverse situation his health is adversely affected and various types of diseases are caused.

### **Infectious Diseases : Concept :**

Infection is a well known word. If one person is suffering from disease and the other person comes in contact with him and is get affected with that disease, then it is called infection. Diseases caused by bacteria, viruses and fungi are infectious. Crores of germs and bacteria from the body of a diseased person reach bodies of other animals via some way and cause disease in them. These bacteria enter human body through medium of air or dust, through water-milk or food, through stings of animals or insects, through - personal contact or through respiration or excreta - urine of disease carrying persons and cause disease. When a disease is spread through bacteria from one animal to other animal we call that disease as the infectious disease. When a large number of persons are attacked with infection of certain disease simultaneously it is called Epidemic. Colds, Influenza (flu), Pneumonia, Tuberculosis (TB) of Lungs. Jaundice, Cholera, Typhoid, Whooping cough, Diphtheria, Measles, Chicken-pox, Leprosy, AIDS, Guineaworm, Dysentery etc. are infectious diseases.

### **Spread of Infectious Diseases :**

Many types of bacteria any how get entry into human body, through air, water, food and contact, white cells contained in (blood, of) human body attack these bacteria. These white cells besiege bacteria of diseases, take the bacteria in their body and kill them. They are body-guards. Anti-toxin as an antidote of poison produced by bacteria of diseases is produced in human blood. Thus due to while blood corpuscles and antidote bacteria of diseases in human body are killed. It is called immunity. Immunity to fight against disease for long time after certain disease is caused is called Acquired Immunity.

Bacteria of a disease anyhow enter the body, reproduce themselves at proper place and colonizes of their own. The time duration required for this is called Incubation period. Thus the time period inbetween entry of bacteria in the body and appearance of the first sign of a disease is called Incubation period.

Different types of bacteria do different actions. Some bacteria are nourished by dead and rotting substances and convert them into harmless substances. Such substances are used as manure for vegetables. Milk is converted into curds and alcohol is prepared from sugar. This is also with the help of one type of bacteria. Some bacteria anyhow get entry into human body and grow there. Due to this, poisonous substances are produced which result in different diseases. These bacteria from a diseased man enter the body of a healthy man and spread disease in such a way that as a result, the epidemic starts. Bacteria of diseases enter the human body mainly through the following ways :

**(1) Through Air :** Bacteria of some diseases enter the human body alongwith air and dust therein, by taking polluted air during respiration e.g. Bacteria of Tuberculosis (TB), Influenza (Flu), Small-pox, Cough etc.

(2) **Through diet (food) :** Water and milk. Bacteria of some diseases enter human body through polluted water, food or milk e.g. Bacteria of diseases like cholera, (intestinal) worms, dysentery typhoid, jaundice etc.

(3) **Through direct contact :** Some bacteria enter directly or through contact. Such diseases are called contagious diseases e.g. Diseases like scabies, ringworms, leprosy etc. spread through direct touch or contact with a diseased person.

(4) **Through animals and insects :** Rabies, Malaria, Plague, Dengue, elephantiasis are caused through bite of rabid animals, mosquitoes, fleas, flies or insects.

(5) **Through rubbing of skin :** Skin works as coverage against bacteria entering into the body. Even then some times bacteria of diseases enter human body through rubbing of skin e.g. Anthrax, tetanus diseases spread in this way.

(6) **Through organs of generation :** Sexual diseases or secret diseases are contagious diseases entering from one body to another body through organs of generation. Gonorrhea syphilis Chlamydia, Herpes, AIDS are diseases spread through sexual contact.

(7) **Through disease holder :** Some men are such that bacteria of specific disease are there in their bodies, but as they have got immunity to fight against such bacteria the disease do not adhere to them, but if bacteria from their bodies enter bodies of others, then they can be diseased. Such persons are called carriers of diseases. In such a way when a man becomes free from certain disease, he is carrier of bacteria for some days. Hence his disease can be adhered to the other person. Diphtheria, typhoid etc. spread through disease carriers.

#### **Characteristics of Infectious Diseases :**

General characteristics of infectious diseases are as follows :

The time - period in between entry of bacteria of diseases into human body and appearance of signs of disease is called Incubation period. During this period white blood corpuscles (w.b.c.) i.e. white cells in blood fight to destroy bacteria. Antitoxins produced in blood do not allow the poison produced through bacteria to affect on human body. The disease - resistance strength of human body is called Natural Immunity.

Some times man, falls ill and then he gets recovered then strength to fight against specific disease is produced in him. It is called Acquired Immunity e.g. man suffers small-pox disease only once and then it does not affect again. Such condition can be brought by injecting acquired immunity vaccine.

- Each infectious disease has a definite time-period. The disease recovers at the end of the time-period.
- All infectious diseases are caused by specific type of bacteria. Each disease is caused by different types of bacteria.
- A person gets immunity to fight against a disease after he is caught once by that disease.
- This disease spreads from a diseased person to a healthy person.
- At the time of attack of an infectious disease the diseased person has to pass through specific conditions.
- A diseased patient experiences characteristics like dislike (or aversion) no appetite, weakness, feeling dry neck, nausea-feeling, feeling body-ache etc.

#### **Control :**

It is very essential for the society to prevent infectious diseases. The method of preventing infectious diseases is called control of diseases. This control can be distributed in two parts.

### **General Prevention :**

In order to get rid of disease, take care that immunity of our body is maintained good. Breathe in and breathe out in pure, to drink clean (filtered) water, to take proper nutritious food, to do proper exercises, to perform yoga and yogasanas regularly, to have (sound) sleep and rest, to take sun-bath at the sun-rise to maintain internal organs of the body clean and healthy to take inject immunity vaccine, to observe rules of health and hygiene and to develop immunity to fight against bacteria of diseases. We should have information regarding bacteria causing different diseases specific disease is caused by certain type of bacteria. If we understand which condition is congenial to bacteria then resistance remedy can be implemented well. Bacteria usually grow in dirty, dark and wet air. So we should reside in well-sunlit and well-ventilated open air residence. Enough water facility, proper gutter (drainage) facility, and sanitation are must.

### **Specific Control :**

The following hints should be followed in order to prevent spread of certain infectious diseases :

- (1) Give a notification to the Health Department :

If any man becomes a victim to infectious disease, immediately the Health Department should be informed, so that they can take proper steps for prevention of that disease.

- (2) The patient should be kept separate and away :

The patient should be kept away from the other healthy person. Keep the patient in a separate room in the house or separate room in the hospital.

- (3) Segregate the person treating the patient :

The person giving treatment to the patient should not be allowed to mix with other persons. He should be kept separate in school or people's contact.

- (4) Inoculation :

In the very beginning of epidemic persons should get injected vaccine and thus develop one's own immunity.

- (5) Quarantine period :

Where the infectious disease has spread, people of such a village should not be allowed to mix with other people. During incubation period keep them separate. Moreover they should be kept under the care of the doctor, so that they won't make healthy person a diseased one.

- (6) Use disinfectants :

Bacteria in all the things that are used by the patient, should be destroyed by disinfectants. Substance by which bacteria can be destroyed are called disinfectants e.g. phenyl.

Disinfectants are of three types :

- (1) Natural disinfectants
- (2) Physical disinfectants
- (3) Chemical disinfectants

**(1) Natural disinfectants :** Sunlight and pure air are natural disinfectants. Keep clothes of the patient and the things he used open in sunlight. Hence bacteria therein are destroyed. The growth of bacteria of typhoid, tuberculosis (TB) etc. stops due to the sunlight. This decreases the strength of bacteria to produce bacteria.



**(2) Physical disinfectants :** Hot air, fire, steam of boiling water etc. are physical disinfectants. So get the low-priced things like cotton bandages, excreta - urine, vomit etc. of the patient burnt. Things like books, clothes vessels etc. can be made germ-free by using hot air.

**(3) Chemical disinfectants :** Chemical substances in solid, liquid and gaseous form are used as disinfectants. If solid substances are to be used, first its solution has to be prepared. Disinfectants like phenol or carbolic acid, cresol, phenyl etc. made from coal-tar are used. Kerosene, petroleum oil are used to destroy maggots (worms) of mosquitoes in closed water. As the soap contains alkali it is used to wash greasiness coarseness of the oil.

Chlorine, sulphur dioxide, formaldehyde etc. gaseous disinfectants are used to make air inside the room germfree.

Now let us get information about four infectious diseases spread through air (colds, influenza, pneumonia, and tuberculosis (TB) of lungs and five infectious diseases (jaundice, cholera, typhoid, guinea worm, dysentery), spread by food and water.

**(1) Common Cold :** Common cold is an ordinary disease of respiratory system. People with less immunity catch up colds with change in seasons, wearing wet clothes.

Virus of this infectious disease spread in air through sneezing, clothes of the diseased person. Virus of colds enter into nose-neck of a healthy person through breathing there and they grow. Hence he is attacked by colds.

#### **Characteristics of colds :**

Headache, nose-watering, sneezing, feeling giddy, burning of eyes, shivering, frequent sneezing, nostrils choked up tube, some times swelling in eustachian tube and hence experience of deafness.

#### **Treatment and prevention of colds :**

Give complete rest to the patient go on smelling Eucalyptus oil in hand-kerchief or clean piece of cloth. Inhale essence of bishop's seeds. Take hot drinks like tea and coffee. Inhale balm, respiratory system opens.

#### **To consult a doctor :**

Well-known saying about colds is : 'Colds comes abruptly and goes slowly'. Many a times carelessness brings colds and then the patient gets rid of it only after treatment.

#### **Flue or Influenza :**

Virus of this disease enter into the body of a healthy person through respiration or sneezing of the diseased person, and through excreta-urine and phlegm and thus this disease spreads.

#### **Characteristics of Flu :**

Sudden fever, colds giddiness bodyache, head-ache, nose.

Fatigue, shivering, body-pain, some times perspiration physical - mental fatigue.

#### **Treatment and prevention of Flu :**

Take complete rest.

Remember : Keep away from cold - humid air, gargle with hot salty water. Give the patient hot, light, liquid and nutritious food, consult a doctor in characteristics of bronchitis or pneumonia. Cleanse clothes and things of the patient with disinfectants.

In epidemic of influenza children of the school should be kept away from crowded places. They may not eat open food of market. Proper use of handkerchief while sneezing, coughing.



**Pneumonia :**

Pneumonia is a disease caused by one type of bacteria and some virus. It is considered as a fatal disease - proportion of this disease in much is children below the age of six.

**Characteristics of Pneumonia :**

In the beginning shivering in body headache, fever. Due to swelling in wind-pipe trouble occurs in breathing in, chest severely aching. The patient has a fit of dry and severe coughing and drags out. Phlegm of yellowish colour. Many a times children have more fever and alongwith it attack of fits also.

**Treatment and prevention of Pneumonia :**

Immediately consult a doctor in case of such characteristics and do treatment accordingly. Children should be particularly admitted to the hospital and proper treatment be given.

**Tuberculosis (TB) of Lungs :**

TB is a disease caused by special type of bacteria. TB is of many types. Particular part of the body is attacked by bacteria, then it is called TB of that particular part. Bacteria enter into the Lungs and then they grow. It is called TB of Lungs. If it starts in intestine, bones or joints then it is called. TB of that specific part. It is a general belief that TB means TB of Lungs. Here we would discuss about TB of Lungs.

**How this disease is caused ?**

Two things are essential for this disease. (1) Entry of particular germs of TB in the body. (2) Favourable condition for the growth of these germs e.g. weakness in body.

Innumerable bacteria of this disease spread in air with breathing and coughing of the patient of TB. Innumerable germs of TB come out in sputum of a diseased of TB. Sputum gets dried, then germs stay flying with dust-particles. When a man breaths in and out in such type of air germs of this disease enter into his lungs.

TB germs enter into the body then TB is definite. It is not so. If a man whose immunity is reduced due to some reason, germs of disease enter into his body and grow there. A man who does not get enough nutritious food, who resides in a place without facility of air and light, a person who has fallen weak due to long sickness, a person who has infection of HIV, immunity decreases. If germs of TB enter into the body of such a person, symptoms of TB appear.

**Characteristics of TB of Lungs :**

In the beginning fever at night and perspiration. Then coughing begins. Cough begins to come out blood in phlegm - chest-ache, rapid breathing, distaste for food, weakness increases day by day, loss of weight, loss of vitality, man becomes bed ridden. If proper treatment is done from the very beginning, then the diseased can be free of disease. If the disease becomes chronic, then the treatment becomes rather difficult.

**Control of TB :**

The central government has launched a movement for eradication of tuberculosis. Survey and free treatment are a part of the movement. Non-government organizations (NGOs) also give a good contribution in its control. Examination (test) of phlegm and X-ray of chest these two things give diagnosis of TB. Control of the disease can be had by timely treatment. For long term prevention, long term treatment is required to be given, until fully recovered.

### **Treatment and Prevention of TB :**

In the spittoon of the diseased of TB there are innumerable TB bacteria. So the diseased should not spit anywhere on road. He should spit in spit-pot with antiseptic medicine. Then close the pot properly and destroy it in fire. At the time of coughing the diseased should hold a hand-kerchief with antiseptic medicine already sprinkled, in front of his mouth keep the patient of TB in a separate room. Others except the nursing attendant should remain away from him as much as possible. His things like clothes, vessels etc. should be kept separate. The patients room and his things should be made free from bacteria. Arrange for enough sunlight and open air in his room.

Take care that dust mixed in air may not enter in our lungs with breathing in and out.

Bacteria of TB live for long in closed and dark place. They die (vanish) in sunlight and open air so house should be kept clean. Have a facility of enough air and light in house.

Entry of bacteria of the disease in the body and lack of immunity to fight against them in blood. These two are responsible causes for this disease. To enhance immunity of the body man should eat. enough nutritious food. Proper exercise, yoga, yogasanas and rest are also required. The diseased needs dry air, plenty of sunlight nutritious food and rest.

BCG vaccine is given to all new borne for prevention of TB

Nowadays many effective medicines are available. That should be taken for a complete period according to the doctor's consultation and advice. Irregularity of the treatment harms the patient, not only that, it harms, much to the society. Due to the incomplete treatment bacteria of TB get accustomed to medicines and then it has no effect. If the other person is infected with those bacteria, then these medicines don't prove effective for him also.

### **Diseases spreading through food and water :**

**(1) Jaundice :** It is a disease caused due to infection of viruses in liver. Incubation period of this disease is 15-50 days. Proportion of bilirubin in body increases. Skin and eyes appear yellowish. This condition is called jaundice. Viruses of this disease come out through stool vomit, urine, blood of the patient and it infects others. Liver gets swelling.

**Characteristics of Jaundice :** Fever, yellowish urine, distaste, vomit and pain. In case of yellowish urine alongwith fever, get immediately the laboratory test done and diagnose whether jaundice or not. It is inevitable to know whether it is jaundice or not, before prescribing medicine for fever.

**Laboratory test :** Proportion of bilirubin increases. Proportion of haemoglobin decreases. Presence of bile in urine is detected.

**Treatment and Prevention of Jaundice :** Inform the health department. If need be, admit the patient in the hospital and give him treatment according to the doctor's, advice. Keep away from the patients contact. Put disinfectant medicine in excreta-urine and then destroy it. Drink water and milk after boiled them. Don't eat stale - open food from bazaar. Take more carbohydrates / glucose in order to increase efficiency of the liver. Avoid ghee-oil-fatty food for some time according to the medical advice. Before taking injection, syringe and needle should be sterilized or use disposable syringe. While donating blood or taking blood, proper test for B. type jaundice should be done. Unsafe sexual relation is harmful.

**Cholera :** Cholera many a times is a fatal disease. It causes due to particular type of bacteria (cholera vibrio).

**Characteristics of Cholera :** Bacteria of this disease enter human body through polluted water and food. In a very short time within three days characteristics of the disease appear. Bacteria enter the intestine and loose motions start. Colour of the motion is like water from cooked rice. Alongwith motions, vomiting also starts. Hands and legs / feet ache. Weakness prevails, Urine hinders. Feeling thirsty. Slow pulse. Body begins to be cold slowly. In absence of proper treatment the patient may die. Throbbing of heart becomes slow. Decrease of proportion of water and salts in body due to loose motions and vomiting, That can be fatal.

**Cholera : Treatment and Prevention :** Inform the health Department. During epidemic drink milk, water after boiling, Don't eat stale open food from bazaar. Excreta, urine, vomit of the patient should be buried or burnt / with disinfectant medicines.

In order to maintain proper proportion of water and salts give him ORS Solution (Oral Rehydration Solution) as First Aid. It can be prepared at home also. In a litre of boiled water add 5 gram salt and 20 gram sugar. Give this solution 750 ml per hour to the adult and 300 ml to children. Clothes bed, vessels of the patient should be cleansed with disinfectant or wash them after boiling in water for half an hour. Nursing person should wash his/her hands with disinfectant medicine or soap.

Children should not be allowed to come in contact with the patient. Give frequently lemon juice or buttermilk. Stop nuisance of flies. Add potassium permanganate in places of water.

**Typhoid :** Typhoid is caused with entry of specific type of bacteria in the body Duration of fever is seven fifteen or twenty one days. There is a typical pattern of rise in temperature so it is called periodic fever.. Attack of bacteria (typhoid bacillus) on intestine of man is responsible for this disease. This disease spreads, through water food and flies.

**Characteristics of Typhoid :** Swelling in intestine, round ulcers, stomach-ache, head ache, fever, physical weakness, hunger decreases, constipation or loose motion. Ulcers in intestine cause bleeding in stomach. If timely treatment is not available then the patient may die. Severe fever may cause sometimes swelling in the brain, which may result in altered sensorium.

**Typhoid : Treatment and Prevention :** Give the patient complete rest. Give him liquid food. Drink milk and water after boiled. If fever increases put cloth soaked in simple water on the body. Get burnt excreta-urine, vomit, of the patient after adding disinfectants. Cleanse clothes bed sheets of the patient with disinfectant medicine or dry them in heat of sun. Nursing person should get injected vaccine of the typhoid. Keep control over nuisance of flies.

**Guinea Worm :** Guinea worm is a worm disease. It is a troublesome worm. Eggs of guinea worm enlarge in stomach of the germs named cyclopsas. These germs are seen in large quantity in water of step well, and dirty - closed water. By drinking such water, these germs enter human body. In digestive organs of man young ones of guinea worm come out from stomach of cyclopsa. Slowly they try to find a way out. They reach toward feet of man. Concerned part of foot gets swelling and it appears like boils. The patient suffers fever pain increases. After few days boils burst. Thin and long worm gets out. We call it guinea worm.

**Treatment of guinea worm :** According to the doctor's, advice roll the worm on straw carefully and draw it out. While doing so, if the worm breaks then there is a boil at another place and it again comes out from it.

**Prevention of Guinea worm :** Drink filtered water. Add disinfectants to water of step-wells and destroy cyclopsa. These germs should be killed by making water pure through chlorine. Now step-wells are mostly filled in. If they are, then also water is not used for drinking. Even then, in Rajasthan near border of Gujarat, this disease still prevails.

### **Dysentery :**

Dysentery are of two types :

(1) Amoebic Dysentery (2) Bacillary Dysentery.

Micro organisms like amoeba enter the body through milk, water or food and cause amoebic dysentery. So there is swelling in big intestine and ulcers. Specific type of micro organisms cause bacillary dysentery. This dysentery causes motions like blood mixed water.



**Characteristics of Dysentery :** In amoebic dysentery some time probably liver is harmed due to micro organisms. Motions, puss or blood alongwith motion, some times greasy. Yellow substance with motion.

In Bacillary dysentery characteristics are rather acute. Water decreases terribly in the body. Drinking of polluted water, staying in over crowded places, indigestion, eating eatables from hotels, hard labour, lack of enough rest. Such a person is easily caught in dysentery and that too, in acute proportion.

**Prevention of Dysentery :**

Causes of dysentery should be removed. Don't take open, polluted food-water. Take enough rest. Give the patient (saltless) buttermilk. Credually, water from cooked rice, moong water, cunjee of sago etc. which are light articles of food may be given. Drink milk-water after it is boiled Treat according to the Doctor's advice.

In order that dysentery may not spread, excreta-urine of the patient should not be thrown in open place but using disinfectants dispose off properly. Don't keep food articles open. Take care that flies may not sit and touch the eatables. In raing season, this disease of intenstine becomes stronger, then avoid heavy food criticles, sweets etc.

**EXERCISE**

**1. Answer the following questions in detail :**

- (1) What is infectious disease ? How do infectious diseases spread ?
- (2) State characteristics of infectious diseases.
- (3) State general control and specific control for control of infectious diseases.
- (4) Give names of diseases spread through air. State their characteristics, treatment and preventive measures.
- (5) Give names of diseases spread through food and water. State their characteristics treatment and preventive measures.

**2. Write short notes :**

- (1) Characteristics and treatment of influenza
- (2) Characteristics and prevention of tuberculosis (TB) of Lungs
- (3) Treatment and control of Jaundice
- (4) Characteristics, treatment and control of typhoid
- (5) Types, characteristics, treatment and control of dysentery.

**3. Write answer to following questions in one or two sentences :**

- (1) What is meant by 'to be infected' ?
- (2) Which cells of body destroy germs ?
- (3) What do we, call method of preventing infectious disease ?
- (4) Why should one get vaccine injected ?
- (5) Which bacteria produce cholera ?



**4. Fill in the blanks with proper word on the basis of the text-book :**

- (1) In order that disease may not cause ..... strength of our body should be developed.
- (2) Substances that destroy germs are called ..... substances.
- (3) Disinfectants are of ..... types.
- (4) In body, some time, ..... experienced due to swelling in eustachian tube.

**5. Answer the following questions by selecting correct choice from the choices given below :**

- (1) In the beginning when does the patient of tuberculosis suffer slow fever ?  
(A) Morning (B) Evening  
(C) Afternoon (D) Night
- (2) In which disease treatment of proper medicines should be taken for long ?  
(A) Colds (B) Typhoid  
(C) Tuberculosis (D) Guineaworm
- (3) How do bacteria of tuberculosis (TB) enter human body ?  
(A) Through food-water (B) Through air  
(C) Through contact (D) Through germs
- (4) How do bacteria of typhoid enter human body ?  
(A) Through rubbing of skin (B) Through organs  
(C) Through animals (D) Through food-water milk
- (5) What is that substance called through which germs are destroyed ?  
(A) Disinfections (B)  
(C) Deoderants (D)
- (6) What is the cause of deafness in colds ?  
(A) Swelling in eustachian tube (B) Shivering in body  
(C) Sneezing (D) Nostrils check up
- (7) Which part of the body is affected by pneumonia ?  
(A) Heart (B) Lungs  
(C) Digestive system (D) Excretary system
- (8) What is the cause of dysentery ?  
(A) Mosquitoes bite  
(B) Affected by colds  
(C) Red cells get destroyed  
(D) Micro organisms named amoeba entering human body

**Activity**

- Prepare a chart showing details regarding characteristics, prevention, treatment of the diseases included in the curriculum.

Running, jumping, throwing, climbing, ascending and descending are the natural activities of human being. These activities are connected with human life. These activities are natural for them. According to the time, there was change in these activities and they were converted in the competition form for measurement, assessment and development. The main aim of organising the competition is to gain enjoyment, development of quality for adventure and development of body.

These are different types of running competitions, but in ancient and modern olympic, the special importance was given to these activities. Due to this, these activities are conducted at different levels. Now athletic activities have gain leading position in international competitions.

Long running, cross country and hurdle running are included in 11th standard syllabus. Let's get details regarding running.

### **Long Distance Running - (3000 mts.) :**

Long distance running required lot of endurance in which 5000 Mts and 10,000 Mts, running are included, but keeping in mind the age and capacity of standard 11 students 3000 mts, run is shown as long distance running.

Body of long distance runners should be thin and fit. They should have also determination and self confidence. Following are the information regarding 3000 Mts long running.

This running has a mainly three aspects :

(1) Start (2) Running strides (3) Finish

#### **(1) Start :**

Generally in long distance running standing start is being taken. In this start runner will keep suitable distance between two legs, keep strong leg behind the starting line and more weight should be on the front leg. Both the hands are kept in running position, the body is leaned forward keeping the balance of the body. The eye should be in the direction of the lane in natural position keeping mind alert. As soon as sound of clapper or pistol will be heard the runner will start running.

**(2) Running strides :** Running strides are divided into the three parts :

(i) Starting

(ii) Transitional strides

(iii) Speedy strids

(i) Starting strides : In the beginning of the race strides should be short and fast.

(ii) Transitional strides : These strides are similar in nature with the short and middle distance running strides. During each stride distance between the strides increases and leaning position of the body is decreasing.

(iii) Speedy stride : In long distance running speedy strides should be taken by using less energy, muscles should be relaxed, strides should be rhythmical. While running, following things should be kept in mind.

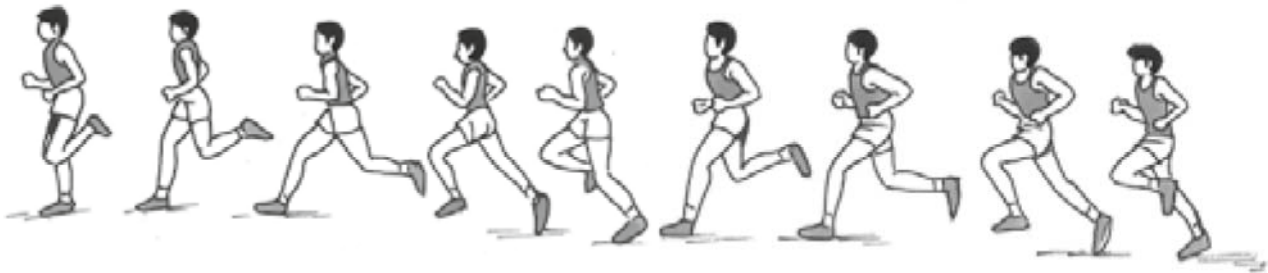
(1) Trunk should be bent forward between  $5^{\circ}$  to  $9^{\circ}$  angle.

(2) The speed of the movement of the hands is less than middle distance running and their swing is lower than the shoulder level.

(3) Hand should be bent at  $90^{\circ}$  angle.

(4) Action of hands and trunk should be such that runner can breathe easily.

(5) The length of the strides are shorter than middle distance running. Rhythm and speed of strides should be continuous.



**(3) Finish :** In long distance 3000 mts running players spend their total energy to cross the finish line. This distance is more or less according to the running distance. How much distance player runs at the maximum speed depends upon the fitness, energy and courage of the players. The strides in long distance running is comparatively shorter than short distance running, because most of the energy has been spent during starting distance. Technique of finishing line of long distance is as per the technique of short distance running.

The athlete should adopt the most convenient technique to gain maximum advantage while crossing the finish line. Athlete can select any one of the following three styles :

(1) The Run through finish

(2) The Lunge finish

(3) The Turn finish

**(1) The Run through finish :** In this technique the finish line is crossed with full speed by the athlete.

**(2) The Lunge finish :** In this technique the athlete bends, his torso towards the finish line in the last stride. While doing so he touches the imaginary line as shown in the figure.

**(3) The turn finish :** In this technique an athlete bends his right or left shoulder (torso) so that he crosses the finish line at full speed.

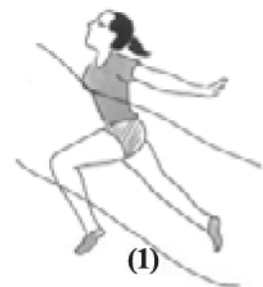
#### Rules :

(1) While taking start an athlete shall not touch either the start line or the ground in front of it with his hands or his feet.

(2) The athlete should start running with the fire of pistol or the sound of clapper. If any one starts running before the sound, he will be given foul-start.

(3) Any athlete who is responsible for a false start shall be disqualified.

(4) Competitor shall cross the finish line with torso.



(1)



(2)

- (5) Athletes shall wear the visible number on the chest and back.
- (6) Once athlete leaves the track during the competition, he shall not be allowed to participate in the race.
- (7) Doping is strictly forbidden and if any athlete do so will be disqualified.
- (8) Any athlete during the race wants to over take the other athlete, he should do from his right side.
- (9) Three official timekeepers shall keep time the winner of every event when all the three watches do not show same timing then following procedure well be adopted.



(3)

- If all the three timekeepers disagree the middle time shall be official.
- If two of the three watches agree and the third disagrees, the time recorded by the two shall be the official time.
- If only two times be available, and if they differ, the longer time shall be official.

#### **Hurdle race :**

Among all the races, hurdle race is an interesting and watchable competition. The athlete has to run fast and also has to cross the hurdles by jumping over them kept at a decided distance. The heights of the hurdles are kept different in various distance hurdle running.

**Rules of Hurdle race :** The following are the standard distances :

Men - 110 mts and 400 mts hurdles

Women - 100 mts and 400 mts hurdles

- Each competitor should cross the 10 hurdles.
- In all the competition each competitor has to run in his own line.
- A competitor jumps any hurdle not in his own lane or in the opinion of the referee deliberately knocks down any hurdle by hand or foot shall be disqualified.
- During the competition if competitor does not knock down the hurdles deliberately then it is not consider as a disqualification and timing will be considered official timing.
- If all the 10 hurdles are as per the standard size and weight then only new record will be considered.
- Start and finish line rules as per the 100 Mts and 400 Mts race.

#### **Ground :**

There shall be ten flights of hurdle in each lane in standard 400 Mts track set out in accordance with the following table.



Sex	Distance of the race (mts.)	Height of the hurdle (mts.)	Distance from the start line to first hurdle (mts.)	Distance between hurdles (mts.)	Distance from the last hurdle to finish line (mts.)
Men	110	1.067	13.72	9.14	14.02
Men	400	0.914	45.00	35.00	40.00
Women	100	0.840	13.00	8.50	10.50
Women	400	0.762	45.00	35.00	40.00

Each hurdle shall be so placed on the track that the support shall be on the side of the approach of the competitor.

#### Dimensions of Hurdles :

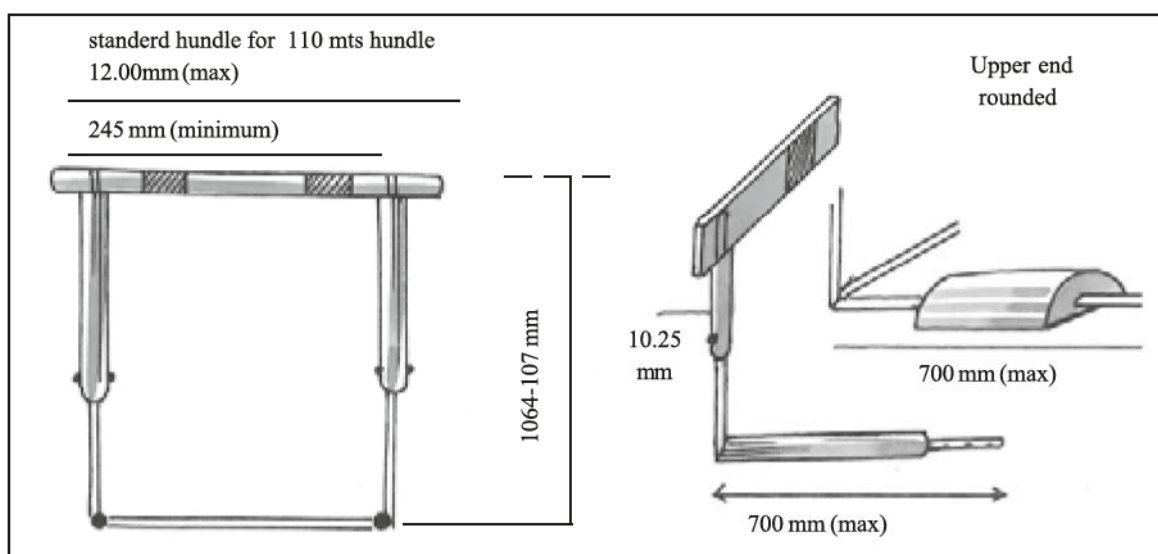
- Height of hurdle for Men in 110 mts 1.067 mts for women in 100 mts 0.840 mts.
- Width of the hurdle is 1.20 mts.
- Total weight of the hurdle should not be less than 10 kg.

#### Skills of Hurdlerace : (100 Mts and 110 mts.)

**(1) Start :** Generally crouch start is taken as per the short distance running. in which medium start is more preferable.

**(2) Action from start to the first hurdle :** After starting athlete reaches at the first hurdle with maximum speed within 8 to 10 strides.

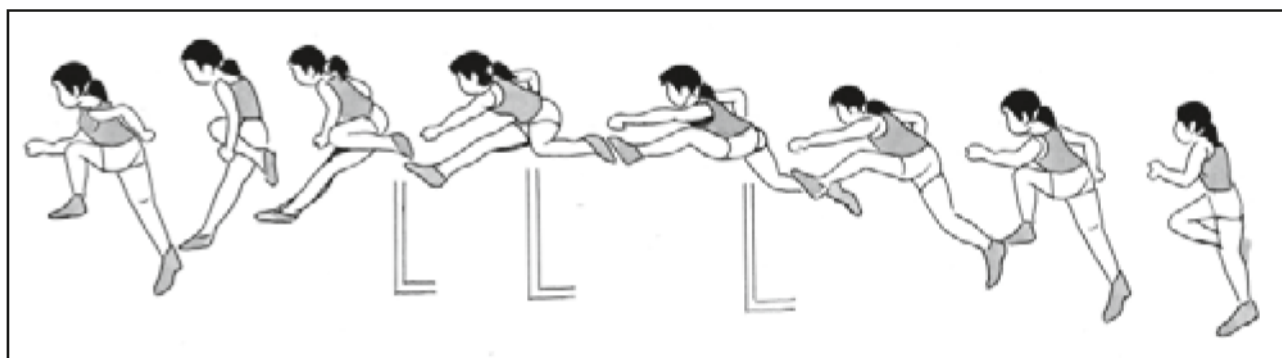
**(3) Action over the first hurdle :** Athlete will manage to reach to the first hurdle after the start so that last stride near the first hurdle will be on strong leg and with same leg athlete will take off to clear the hurdle. During this phase free leg and opposite hand will be extended straight. This time runner will lean the body forward in running direction. When the body will cross the hurdle at that time athlete will bend his strong leg in



that manner so that knee and heel of the athlete will be parallel to the height of hurdle and knee will be at right angle to trunk as well as knee will cross from the side and he will land on free leg. Important point is that distance from the jump up to clearing the hurdle is less than landing. Body will clear the hurdle in such a way that thigh of the free leg will pass near the hurdle. All other hurdles will also clear this way.

**(4) Action between the hurdles :** When athlete lands on free leg at the same time he extends the bended strong leg forward, landing is performed on the toes and thus action of strides between the hurdles starts. In short distance hurdling athlete takes three stride where as in long distance he takes required strides and then he will be ready to clear the other hurdles. Distance between take off and landing will be as good as previous distance.

**(5) Action of strong leg :** Athletes will take the stride from the starting line in such a way that last stride near the first hurdle will be on the strong leg with the same leg he takes off to clear the hurdle. When the body



will cross the hurdle at that time athlete will bend his strong leg in that manner so that knee and head of the athlete will be parallel to the height of hurdle and knee will be at right angle to trunk as well knee will cross from the side and he will land on free leg. All other hurdles will also clear this way.

**(6) Action of free leg :** While crossing the first hurdle athlete will take off on the strong leg. At that time free leg and opposite hand will extend forward. Body from the waist will bend forward. When athlete clears the hurdle at that time thigh of free leg will pass near the hurdle and lands on the free leg. All other hurdles will also clear this way.

**(7) Arm action :** Movements of the hands will be as per short distance running. Hands will extend freely forward - backward while clearing the hurdle muscles of the shoulder should be stretched maximum to gain the jumping ability. Back hand will bend at right angle and fingers will be as per short distance running.

Movements of hands and action of trunk should be in such a way that maximum speed can be gain.

**(8) Action of chest and Back :** When athlete will clear the hurdle at that time he bends the body forward in running direction. This time chest and free leg of athlete will be parallel to ground. Back will be towards the sky. When strong leg will bend from the knee to clear the hurdle at that time body or back will be at the right angle.

### **Cross Country :**

Cross country is a long distance running. This is popular all over the world. Physical fitness components

can be developed through this competitive running, such as energy, flexibility, muscular power, endurance as well cardio- respiratory endurance. This type of running is organised in open ground, on the road,, zigzag way in jungle etc.

### **Marking of Running area :**

Running area of cross country will be 1500 to 2000 Mts straight in starting that so to avoid the crowd in the starting and to decide winners at the end of competition becomes easy. In between running area there should be obstacles like uphill, down hill, sand, rock etc. There should not be public road in running area.

**Rules :** (1) Distances for team champion IAAF divided distance in following five category :

(1)	Long running area for men : 12 km
(2)	Short running area for men : 4 km
(3)	Junior Boys : 8 km
(4)	Long running area for women : 8 km
(5)	Short running area for women : 4 km
(6)	Junior Girls : 6 km

(2) Squares are marked on the starting line. All members of the team will stand one behind others in square. Start will be as per the long distance running.

(3) Team consist of minimum 4 and maximum 8 players. 6 players can take part in competition. While deciding winner points of only four competitors will be considered.

(4) All the participates are given winning number. Winning numbers are their points : Points of four competitors from each team will be added who will score less no. of points will be declared winner then winner is decided in the points of ascending order. If there is a tie the last competitor of the team who is near to obtained score will be declared winner.

### **Exercise**

#### **1. Answer the following question in detail :**

- (1) Mention the skills of long distance running and explain the finish.
- (2) Write the rules of hurdle in short.
- (3) What do you mean by cross country ? How the running area of cross country is marked ?
- (4) Explain the running strides of long distance running.
- (5) Explain any one skill of hurdle race.

**2. Write short notes :**

- (1) Cross country
- (2) Transitional strides
- (3) Action of strong leg in hurdle race
- (4) Rules of long distance running.

**3. Write answer of following questions in one or two sentences :**

- (1) How many types of running strides ?
- (2) What should be kept in mind while crossing the leading competitor ?
- (3) How many types of finish ?
- (4) Write the skills of hurdle race ?
- (5) How many minimum players are required for cross country race ?

**4. Answer the following questions by selecting correct choice from the options given below :**

- (1) What type of start is taken in long distance running ?
  - (A) Medium
  - (B) Crouch
  - (C) Elongated start
  - (D) Standing start
- (2) What is the height of hurdle in 100 mts. race ?
  - (A) 1.067 mts
  - (B) 0.840 mts
  - (C) 0.762 mts
  - (D) 0.91 mts
- (3) How many hurdles competitor has to clear in hurdle race ?
  - (A) 8
  - (B) 6
  - (C) 10
  - (D) 12
- (4) Which of the following quality is not developed through cross country race ?
  - (A) Memory
  - (B) Endurance
  - (C) Muscular power
  - (D) Cardio-respiratory edurance
- (5) Which of the following is long distance running ?
  - (A) 800 mts run
  - (B) 400 mts run
  - (C) 3000 mts run
  - (D) 3500 mts run

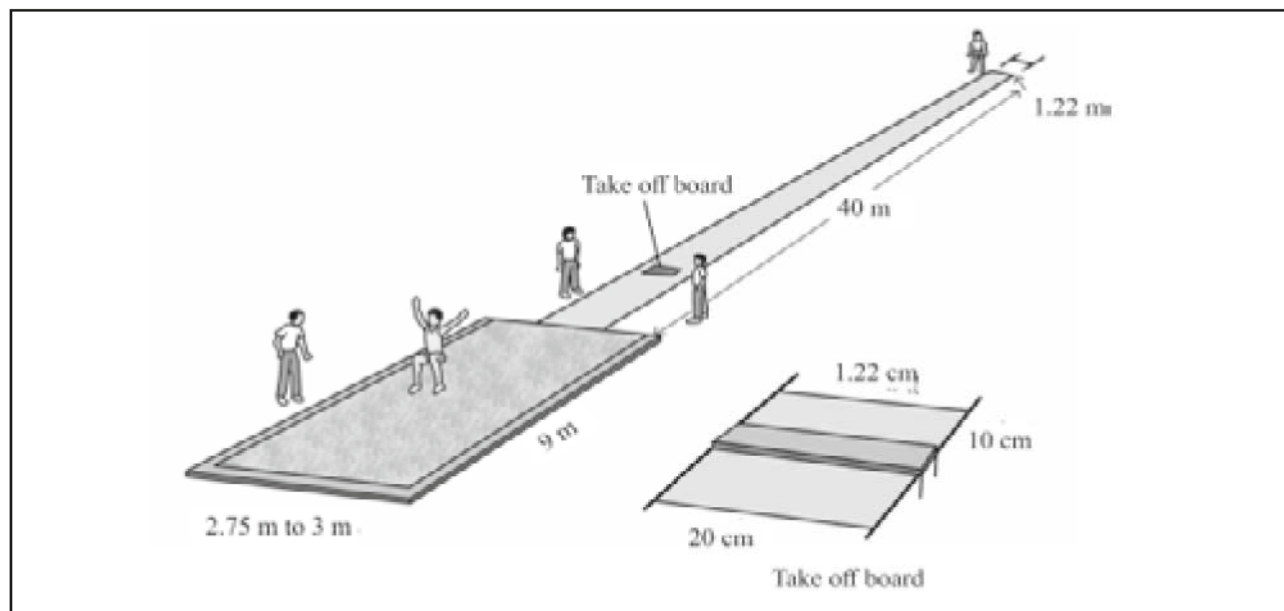




# 8

## Hop - Step - Jump (Triple Jump)

In ancient Greece country the method of "Hop-Step-Jump" was of different types. In 19th century many strange methods were adopted. The competition seems to have started in Ireland. The Irish player F.A.M. Weber was the first one who had demonstrated the method of jumping "Hop-Step-Jump".



### Play Ground :

#### The distance of take-off board from the front edge of the jumping pit :

For Men : 13 metres

For Women : 11 Metres

Taking into consideration the level of the competitors this distance can be changed.

### Skills of Hop-Step-Jump :

(1) Approach run (2) Hop (3) Step (4) Jump (5) Landing

Now we shall study these skills in detail as follows :

**(1) Approach run :** Like long jump, in hop-step-jump also, an approach run is used to get maximum speed and cover more distance with better take-off. The method of approach run is like long jump. The approach run is shorter than that of long jump.

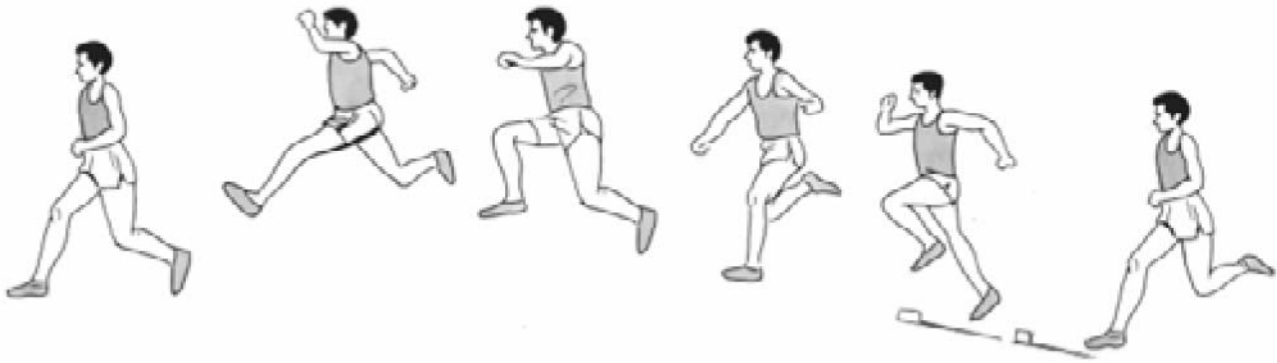
**(2) Hop :** To get better performance in this skill, the following three actions are needed to perform with specific attention.

**(a) Take-off :** Making the use of Newton's third law of motion and the principle of projectile, a take-off is to be taken from a take-off board with a strong leg and the body is lifted upward and forward at an angle of  $25^\circ$ . In this action, the body is leaned little forward keeping the trunk of the body little on the back side of the take-off board. While keeping the centre of gravity on the lower side, the speed does not decrease, but it gives advantage in the step and jump.

**(b) Floating in the air :** In floating a jumper keeps his body straight in the air. While take-off, the free leg which was in front is to be straightened and the swing is to be given on the back side. This time the take-off leg is bent from the knee and taken forward. In this whole action the movements of the hands and the head, help in keeping the balance of the body.

**(c) Landing :** While landing, the strong leg which was bent, is brought forward. Thus, the body travels forward and comes toward the ground for landing. This time the free leg remains on the back side and the weight of the body remains little on the back side from the point of landing. This action gives motion to the leg for the action of step. This time, both the hands are swung upward to take the body upward.

**(3) Step :** To do the action of the step properly, one should concentrate on the actions of take-off, floating



in the air and landing.

**(a) Take-off :** In the action of take-off in step skill also, the same strong leg shall be in use. The action of step is done with the free leg. The angle of lifting the body in this action is more than that of the hop i.e.  $35^{\circ}$ . The movement of the hands shall help in keeping the balance.

**(b) Floating in the air :** After taking the take-off for the action of step the take-off leg is bent from the knee and the body is lifted upward and then downward for the action of landing. The hands shall be kept little in the bending position to keep the balance of the body.

**(c) Landing :** The landing in the step skill is done on the free leg. The centre of gravity lies on the take-off point. While landing the heel of the leg touches first to the ground and then the ball of the leg and the toes shall touch the ground last. The point of landing in step, should be the point of take-off for jump skill. Here the free leg and the hand shall help in keeping the balance of the body.

**(4) Jump :** To do this action in a better manner the following three actions should be done properly.



**(a) Take-off :** The take-off action in the jumping skill shall be done on the leg which is free in the action and take-off in the skill of hop. Keeping the motion of the body in control a jumper shall try to lift the body upward and forward at an angle of  $45^{\circ}$ .

**(b) Floating in the air :** The action of floating in the air shall be like that of long jump.

**(c) Landing :** Landing shall have to be done like the long jump. A jumper shall keep his legs a little apart and with the swing of the hands shall try to push the body forward to cover more distance of the jump.

To have better jump and to cover more distance in the jump, the ratio of the distance covered in hop, step and jump should be either 3 : 2 : 3 or 10 : 7 : 10.

**Rules :**

- (1) The distance between the front edge of the take-off board and the far end edge of the jumping pit should be 21 metres, minimum.
  - (2) For the international competitions it is recommended that the distance between the nearer edge of the jumping pit and the front edge the take-off board for men should not be less than 13 metres and for women it should not be less than 11 metres. In other. competitions it can be kept according to the level of the competitors.
  - (3) According to the rule a competitor shall have to perform the actions of hop, step and jump in sequence.
  - (4) In the actions of hop, step and jump, if the free leg touches the ground, it shall be a foul turn.
- Over and above the rules, narrated above, other rules of long jump shall be applied for the competition of hop, step and jump.



**Exercise**

**1. Answer the following questions :**

- (1) Show the skills of hop-step-jump and explain the hop skill in detail.
- (2) Draw the ground of hop-step-jump and give the names and the measurements of the respective parts.
- (3) Write the rules of hop-step-jump.

**2. Write short notes :**

- (1) Skill of step (2) Take-off skill.

**3. Answer the following questions in one or two sentences :**

- (1) Give the name of the last skill of hop-step-jump.
- (2) On which leg does a hop-step-jump competitor land ?
- (3) How many jumps are there in the hop-step-jump ?
- (4) Show the distance between the take-off board and the far end edge of the jumping pit ?
- (5) To gain an advantage, at what angles in serial order the hop-step-jump actions should be done ?

**4. Select proper options for the answers of the following questions :**

- (1) For men competitors, what should be the distance between the take-off board and the nearer edge of the pit ?  
 (A) 11 mts. (B) 15 mts. (C) 13 mts. (D) 9 mts.
- (2) What is the first skill in hop-step-jump ?  
 (A) Take-off (B) Landing (C) Floating in the air (D) Hop

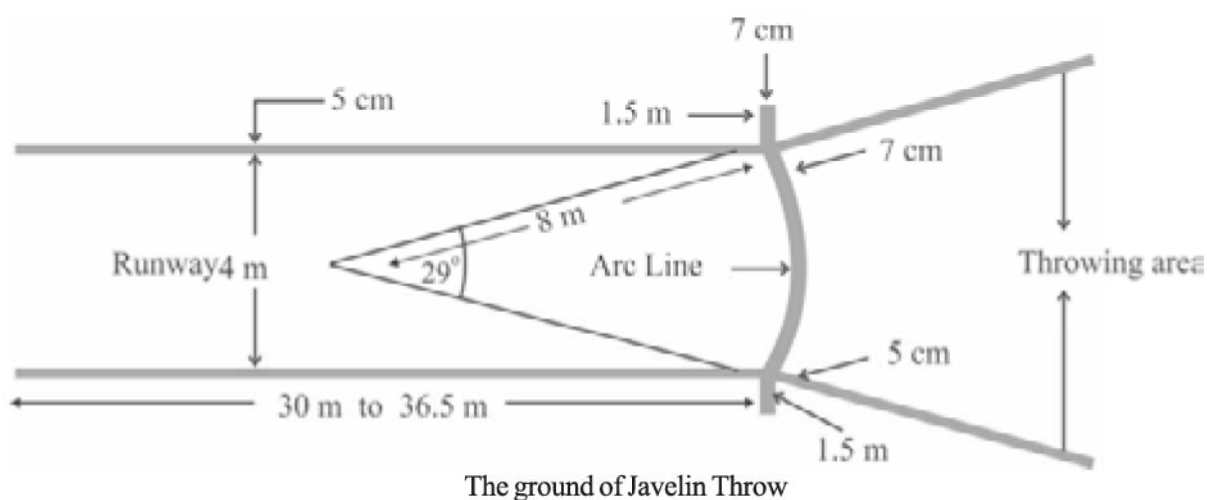


Man has been using the spear for hunting and in wars since ancient times. When the ancient Olympic games began, Javelin Throw was included in the group of five games called 'Pentathlon'. In beginning, It was allowed to throw a javelin with turn, but it was dangerous method for competitors, referee and spectators. IAAF Prohibited to throw in such method. In beginning the measurement and shape of Javelin were not fixed. IAAF Prepared rules, fixed the measurement and shape of Javelin, prepared rules for throwing also.

A Javelin throw was included in 1908 Olympic games for man, and in 1932 Olympic games it was also included for woman.

### Javelin Throw

#### The Ground :



The ground of Javelin Throw

The ground of Javelin Throws has been divided in two parts : (1) Run way (2) Throwing Area

#### Run Way :

- (1) The breadth of Runway is 4 metre
- (2) The length of Runway is 30 metre to 36.5 metre
- (3) The breadth of marking lines are 5 cm.
- (4) The breadth of Arc Line is 7 cm.

#### Throwing Area :

The throw shall be made from behind an arc of a circle drawn with a radius of 8 m. The breadth of a arc is of 7 cm. So take a radius of 8.07 m and draw a arc. So that the breadth of the arc will be 7 cm. The arc will be made of a wooden or metal strip 7 cm in width at ground level. It will be painted white. Lines shall be drawn



from the extremities of the arc at right angles to its parallel lines marking the runway. These lines shall be 1.5 m in length and 7 cm in width. The throwing area or a sector is marked on the ground by extending the lines from the centre of a circle having a radius of 8 m, of which the arc is a part, through the points at which the arc joins the lines marking the runway. The angle of the throwing area will be  $29^{\circ}$ . The ground lies from the North to the South.

#### **Equipment :**

(1) Javelin (2) Measure tapes (3) String (4) Lime powder (5) Bucket (6) Nails (7) Flags, etc.

#### **Javelin :**

The Javelin is made from cane, bamboo or aluminium. But in a competition, a javelin made from aluminium is used. The measurements of Javelins for men and women are given in the following table :

#### **Details of Measurements, weight etc. of Javelin for Men and Women :**

<i>Sr.</i>	<i>Particulars</i>		<b>Men</b>	<b>Women</b>
1.	Weight for competition for acceptance record minimum		800 gm.	600 gm.
2.	Weight for competition	Min.	805 gm.	605 gm.
		Max.	825 gm.	625 gm.
3.	Length of the Javelin	Min.	2.60 m.	2.20 m.
		Max.	2.70 m.	2.30 m.
4.	Length of Metal Head	Min.	25 cm.	25 cm.
		Max.	33 cm.	33 cm.
5.	Diameter of shaft	Min.	25 cm.	2.0 cm.
		Max.	3 cm.	2.5 cm.
6.	Distance between the tip of metal to the grip	Min.	0.90 m.	0.80 m.
		Max.	1.02 m.	0.92 m.
7.	Width of the grip	Min.	15 cm.	14 cm.
		Max.	16 cm.	15 cm.

#### **The skills of Javelin Throw :**

(1) Grip (2) Carry of Javelin (3) Approach (4) Throw (5) Release (6) Change of feet (Balancing)

#### **Grip :**

In Javelin throw, it is compulsory for a competitor to hold the Javelin at the cord wrapped on the middle part of the Javelin. There are three types of grip (1) Finish Grip (2) American Grip (3) Hungarian Grip.

**(1) Finnish Grip :** In this type of grip, the javelin is held with palm from the back side of the cord. The first finger is kept free and slightly bent, the second finger is wrapped around the cord. The third and the fourth fingers are fixed on the cord slightly away from the second finger. The thumb touches the second finger from the opposite side.



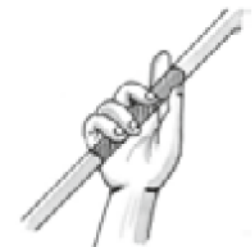
Finish Grip

**(2) American Grip :** In this type of grip, the first finger is kept on the back side of the cord and the other three fingers are placed around the cord. The thumb is kept on the cord at the back slightly away from the first finger.



Americian Grip

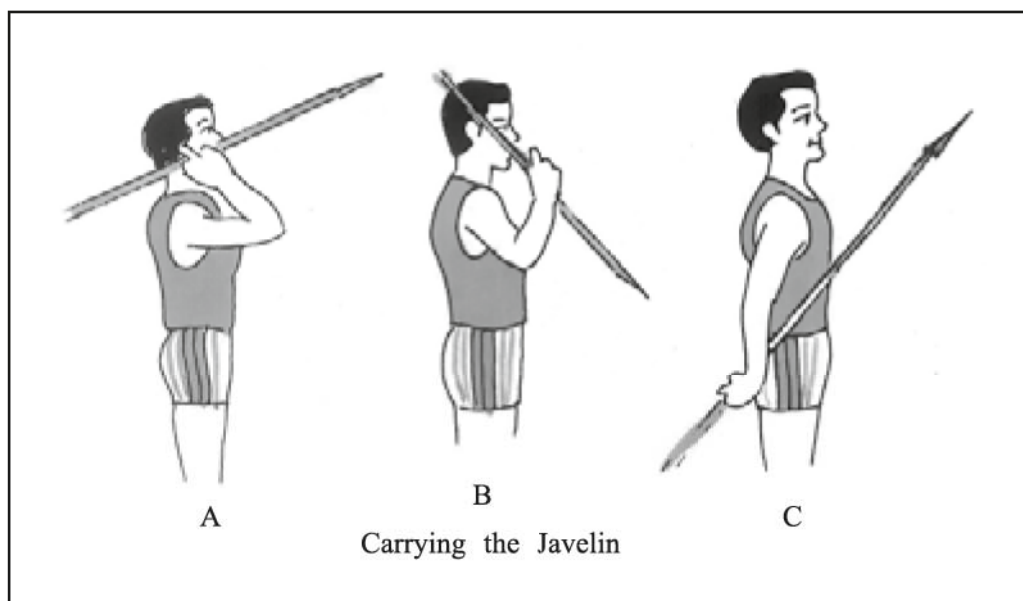
**(3) Hungarian Grip :** This grip resembles the American Grip. The only difference is that the first finger is kept straight and stretched on the cord. The other fingers give momentum to the javelin with a push. The thumb is kept nearer to the fingers, holding the javelin from the other side to give them support.



Hungarian Grip

**Carrying the Javelin :** The carrying skill helps the player run easily with the javelin gripped in his hand. There are three prevalent methods of carrying the Javelin. They are :

- (1) Carrying the javelin a little above the shoulder keeping the point in the upward direction (Figure A)
- (2) Holding the javelin above the shoulder but keeping the point in the downward direction (Figure B)
- (3) Arm holding the javelin straight on the side. The hand holding the javelin tilted to the back javelin below the arm-pit. The Javelin point in the upward direction (Figure C)



For the trainee students, type A of carrying the javelin is suitable. After taking the training type C of carrying javelin is easy for them.

**Approach :**

The action of running with the javelin in hand for throwing it is called the approach run. In this action, the last five steps are very important. How much a player can throw a javelin depends on these last five steps. During the approach run, three points to be kept in mind are : speed, distance and check-mark. The length of the approach run should be such that the competitor will be able to gather the maximum speed at the time of throwing the javelin. Generally, athletes should keep a distance of 30 m to 36.5 m in the approach run.

**Throw and Release :**

The competitor starts his throwing action from the first check-mark. The competitor prepares his body before throwing by warm-up activities. In all the methods of styles of throwing, the body at this juncture gets forward for the throwing action. When the athlete moves his left leg forward, the body gets additional momentum which is converted into the throwing of javelin. After that, when the right leg is straightened from the knee and hand holding the javelin is straightened, moved forward, the javelin is released from his hand with jerk of elbow, shoulder, wrist and fingers. It is realised from his hand from above the right shoulder at an angle of 40°. Generally, during throwing the javelin it makes an angle of 35° to 40° with the of round.

**Changing Feet (Balancing) :**

In order to control the forward motion of the body and to prevent the body from committing mistakes owing to the speed, the athlete, in order to maintain the balance of his body, has to place his right-foot near the throwing line. While transferring the weight of his body on the right leg, the left leg has to be raised at the back. The athlete can maintain the balance of his body with this action of reversing the legs.

**Rules for Javelin Throw Competitions :**

- (1) The order of the competitors for throwing the javelin will be decided by lots.
- (2) A competitor will be allowed to use only a javelin approved by the equipment checking committee.
- (3) A competitor should wear clean clothes. The clothes should not become transparent even when they become wet.
- (4) A competitor should exhibit his competitor number on his chest and on his back in such a way that it is clearly visible.
- (5) Before the start of the competition, each competitor will be given two practice trials in turn, in the presence of a judge.
- (6) After the competition starts, no competitor will be allowed to make use of the runway or the ground for practice purposes.
- (7) The competitor has to take a grip on the cord.
- (8) After having begun the action of throwing the javelin, if beginning of throwing or in runway a javelin touches the ground, his trial will be considered a foul.
- (9) A competitor can participate barefoot or may put on shoes or spikes on one foot.
- (10) A competitor cannot ask for all the three or six trials to be given consecutively.
- (11) A competitor has to throw the javelin one minute after his trial begins. If a competitor deliberately takes more time, his trial will be considered a foul.
- (12) If there are more than eight competitors, each will be given three trials and if there are less than eight, each will be given six trials.

- (13) If there are more than eight competitors each will be given three trials initially. The best eight competitors will be selected on the basis of their best throw. If for the eight place there are two or more competitors, all of them will be given three additional trials by turn until the tie is solved.
- (14) The final eight competitors will be given three additional trials each and the winning order will be decided on the basis of the best throws of all the six trials.
- (15) No competitor will be allowed to place his handkerchief or any other thing as a mark in the throwing area.
- (16) Only after the javelin thrown by a competitor falls on the ground and only after he has regained his standing position, he can come out from behind the throwing arc.
- (17) If the javelin thrown by a competitor falls on the sector line, that throw will be declared a foul.
- (18) In javelin throw, a throw will be considered valid if the tip of the metal head of the javelin touches the ground first.
- (19) If a javelin breaks in the air during the course of throw, the competitor will be given another trial with a new javelin, but if the javelin breaks after touching the ground, it will be regarded as a valid throw and will be measured and recorded.
- (20) Flags will be planted on the throwing area to indicate the record in the competition and the world record.
- (21) If there is a tie for the winning numbers, the next best throw will be taken into consideration. If the descending figures up to the next six throws are the same, and if the tie is for the first place, each player will be given one more trial. They will go on getting more trials until the tie is resolved. If the tie is for the second or the third place, both will be given the same rank.
- (22) The competitor will not leave runway until the javelin falls on the ground.
- (23) Use of hand gloves is forbidden.
- (24) The competitor may apply a suitable substance on his palm in order to get a good grip on the javelin.
- (25) A competitor may wear a strap of leather or some other material to avoid injury to the waist or the back.
- (26) The slope or indication of the runway towards the throwing area should not be more than 1:1000.

**Points to be kept in mind during throwing the javelin :**

- (1) Right handed competitor will place his left foot first in runway.
- (2) One should run in a maximum speed in runway.
- (3) A Javelin should be pulled behind in runway.
- (4) A Javelin is released from above the shoulder.
- (5) In release action, the weight of the body should not put only on the heel, but it should be on the foot.
- (6) When Javelin is released the athlete in order to maintain the balance of his body, he should change his leg, the back leg brings in front.



- Note :** Information is given to considering right handed competitor. For left handed the action of hands and feet will be reverse.

**1. Answer the following questions :**

- 2. Answer the following questions in one or two sentences :**

- 3. Select correct option, out of the options given below the questions :**

-

**History :**

Volleyball is an International game which is played in open air ground and in indoor hall. Volley ball game was invented in America in 1895 by Prof. William A. Morgan. In the beginning name of game was 'Mintonat'. After the advice from his college A.D. Helstard the name was kept volleyball. This game is played keeping ball in air all the time. In English playing ball in air is called 'Volley', so that volley ball is a suitable name for the game.

The volleyball game was started in India by Y.M.C.A. Madras. Due to less space, equipment and less expenditure this game became very popular in India. Today each school - college has facilities of volleyball ground today above cities to villages also this game became very popular and played with interest. According to volleyball rules and with the hard work of Shri R. S. Kirpanarayan first All India Volley ball tournament was held in 1933.

The volleyball federation of India was formed in 1951 to coordinate the game at National level Today different competitions of this game is held at Taluka, District, National and International level. During Barlin Olympic demonstration of game was organised in 1936. In 1939 volleyball game was included in world university sports festival. International volleyball federation was established in 1947 and prepared the rules of the game. The first volleyball championship at world level for men was held at Czechoslovakia in 1949. In which Russia became champion. Asian volleyball federation was established in 1954. Asian volleyball championship was held in Tokyo (Japan) in 1955 and India won this championship. Third Asian game was held in 1958 in Tokyo in which volleyball game was included officially. First time India had participated in this championship. In 1964 Olympic game Russia, Czechoslovakia and Japan won the championship respectively.

**Ground of Volleyball Game :**

**(1) Ground :** Volleyball ground is 18 mts, long and 9 mts wide, surrounding by a free zone, which is a minimum of 3 mts wide on all sides. The free playing space shall measure a minimum of 7 mts in height from the playing surface.

For FIVA world championships the free zone shall measure a minimum of 5 mts from the side lines and 8 mts from the end lines. The free playing space shall measure a minimum of 12.5 mts in height from a playing surface.

**(2) Centre Line :** The axis of the centre line divides the playing court into the equal courts measuring 9 mts × 9 mts each.

**(3) Attack line :** On each court an attack line whose area edge is drawn 3 mts back from the axis of the centre line marks the front zone. The attack line is extended by the addition of broken lines from the sidelines; with line 15 cm short line 5 cm wide drawn 20 cm from each other to total length of 1.75 mts.

**(4) Boundry line :** Two sidelines and two end lines mark the playing court. Both lines are drawn inside the dimensions of the playing court.

**(5) Service area :** The service is performed behind the end lines, which is called service area.



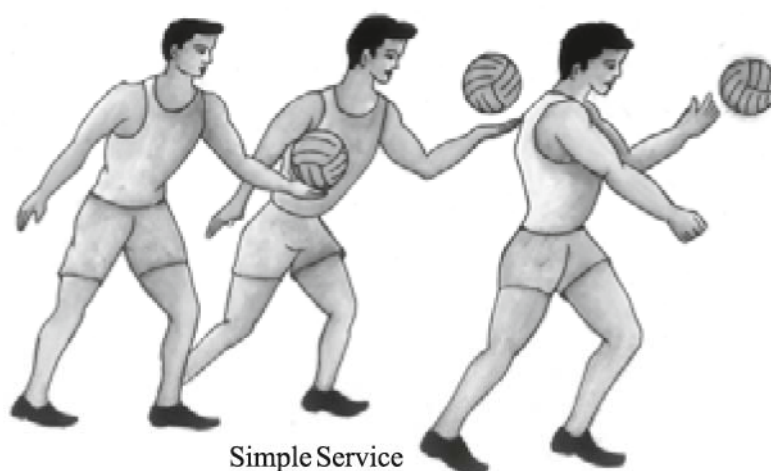
### Other Equipments :

(6) Referee stand, (7) lining machine (8) Score sheet (9) Whistle (10) Rope (11) Wind measurement device (12) Lime powder (13) Air filling pump (14) Stop watch (15) Table, Chairs etc.

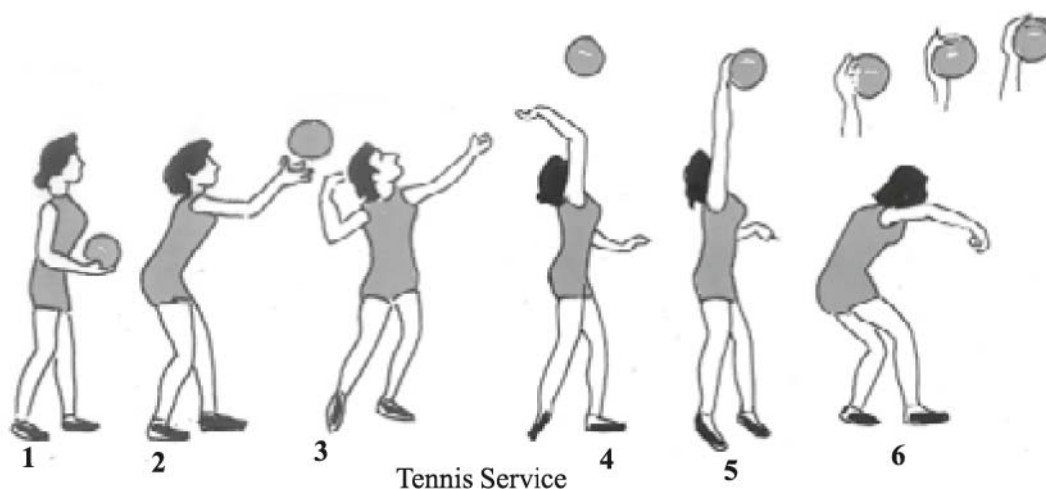
### Skills :

**(1) Service :** From the end line of one's own court, a player tosses the ball up with one hand and sends it over the net to the opposite court by hitting the ball with fist or any part of hand. Following are the types of service.

**(1) Simple Service :** In this service the player stands facing the net and putting one foot forward tosses the ball up and with the swing of the other hand hits the ball with the base of the palm of that hand and sends it over the net to the opposite side. This service is also called 'underhand' service.



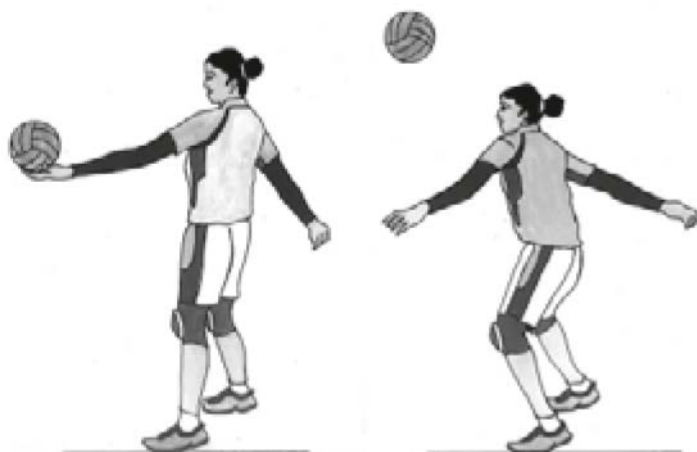
**(2) Tennis Service :** In tennis service, the player tosses the ball up, higher than the level of his head. Then he over extends his right hand upward and behind the head and as the ball comes down to his head level, he quickly smashes with the right hand forward and with the palm of his right hand



to send it over the net to the opposite side. This service is also called 'overhead service'.



**(3) Side Arm Service :** In this service, the player keeps his body side ward, which means while



Side Arm Service

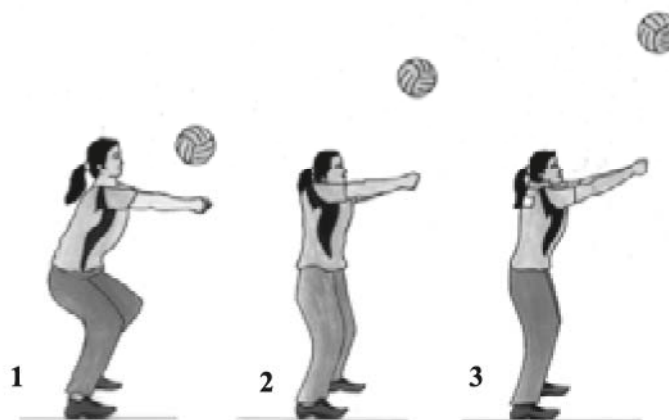
serving the ball, his left foot and left shoulder should be in the direction of the net and in this position he tosses the ball up to his head level and as the ball comes down he abducts right hand sideward and hits the ball to send it over the net to the other side.

**(4) Round Arm Service :** In this service, player stands in service area with opposite shoulder is towards the net, then player tosses the ball up higher than the head. Other hand is rotated from behind with face sharing to hit the ball forcefully, with open palm to send it over the net to the opposite court. To make action effectively player can take little jump with forward leg and complete the action.

**Passing :**

Normally after receiving the ball from the opposite side a player passes it to other player of his own team. This is called passing. A ball can be passed in two different ways.

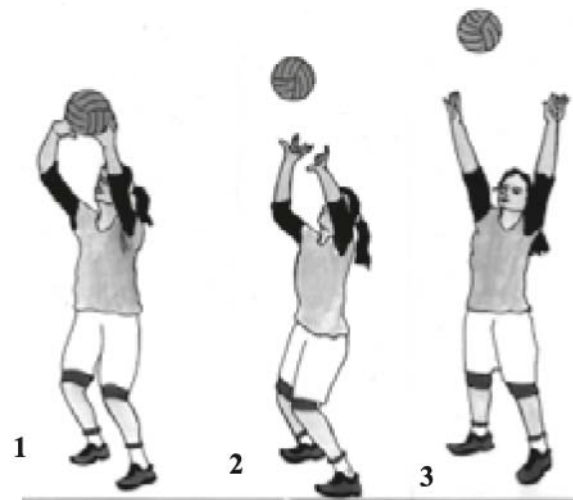
**(1) Two Hand Underhand Pass :** During the play, if the volleyball is received from the opposite side below the waist level it is passed using this skill. In this pass the player keeps his legs slightly



Underhand Pass

open and bent from the knees and covers the first of one hand with the palm of the other hand, keeping both the hands together and straight he/ she passes the ball by taking it on his / her forearms.

**(2) Two Hand Overhead Pass :** During the play when the ball comes from the opposite side at the level of head, the skill to play it near the forehead by with the fingers of both the hands is called Two hand over head pass.

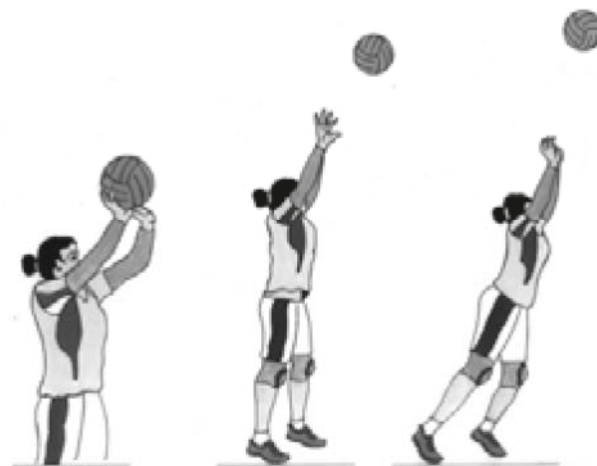


Two hand overhead Pass

#### Setting :

In volleyball game ball passes fairly high and close to the net for the attackers to smash downward, in the opponents court is called setting or set up.

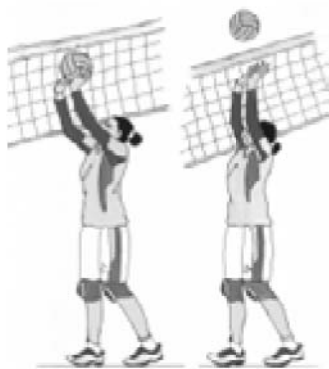
**(1) High set up :** The setter lifts the ball high over his own head near the net is called high set-up. In this set up player lift the ball above his head over the net approximately 1.25 to 1.50 mts high.



High set up

## **(2) Low set-up :**

The setter lifts the ball about 2 to 3 inches over the net. The ball is set by overhead or underhand



Low set-up

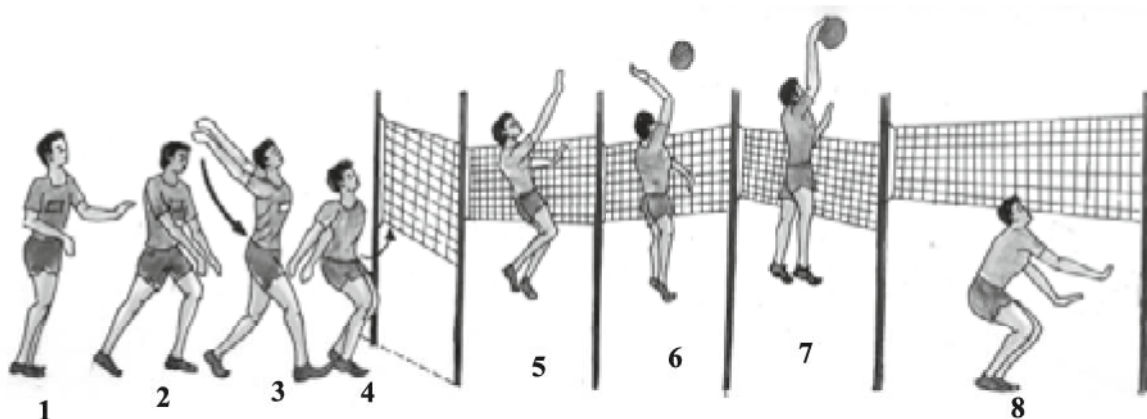
pass over the net. The ball is set over the net at proper place so that opposite shall not think about blocking the smasher hits the ball to opponent court.

## **Smashing or spiking :**

Smashing means playing the ball over the net in the opponents court forcefully by the smasher it called smashing. To score more point this a is a very useful skill for attacker. This skill shall be more used by front line players. There are two types of smashing - (1) One leg take off (2) Two leg take off.

**(1) One Leg take off :** Players takes two or three steps and take jump with one leg to hit the ball which a set over the net. The ball should be hit with open palm by the strong hand. While performing this skill player should not violate any centre line or net foul.

**(2) Two Leg take off :** In this skill the spiker comes running and spikes the ball over the net



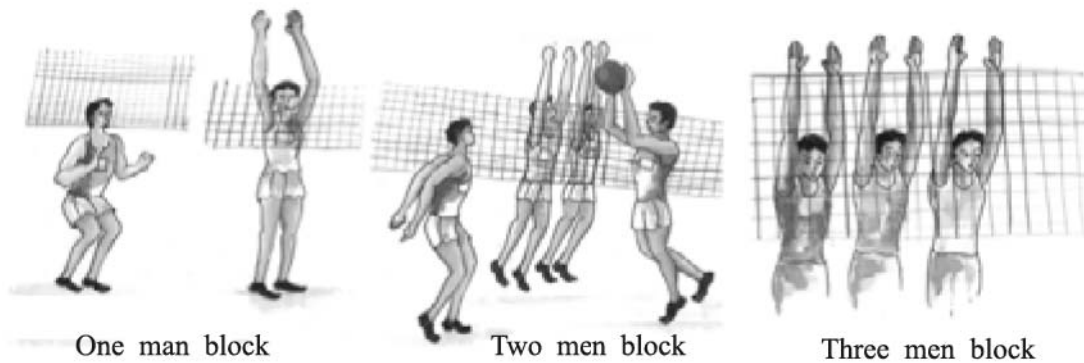
Two Leg take off

by taking two legs take-off. To score more points this skill is important.

## Blocking :

Blocking is an action of player close to the net to intercept the spiked ball coming from the opponents by reaching higher than the top of the net. Only front row players are permitted to complete a block. This technique is performed by three ways : (1) One man block (2) Two men block (3) Three men block.

To stop the ball over the net by one man block, two men block and three men block. Players who have quick reaction time, proper time and jumping ability and are able to maintain balance in the air



can do very well in blocking. In this skill players tried to stop the spiked ball by open palm of both the hands. This is a best defensive skill of volley ball.

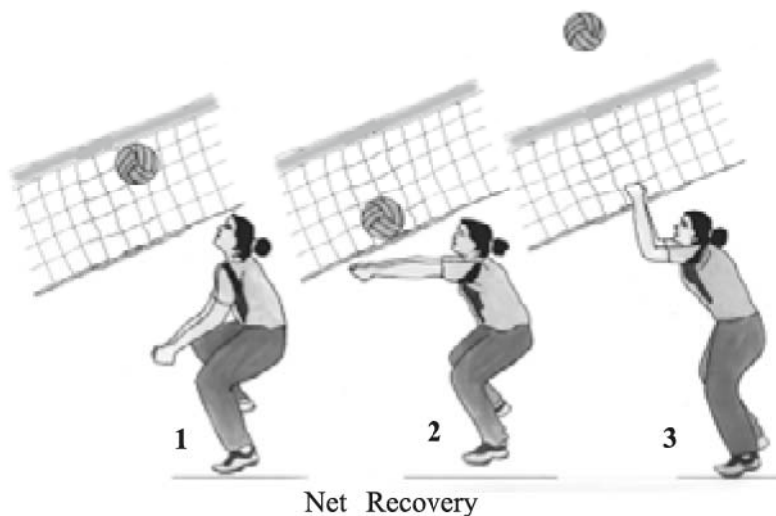
(1) **One man block** : One player from the front line block the ball which is smashed by the opposite team.

(2) **Two men block** : Two front line players block the ball which is smashed by the opposite team. In this block there are more chances to block the ball.

(3) **Three men block** : All the three front line players block the ball simultaneously which is smashed by the opposite team. In this technique chances to block is more. This skill is very much essential to defence the opponent attack.

## Net Recovery :

During game recovering the ball after it rebounds off the net and successfully made ball in play



Net Recovery



is called recovery. Front line players should be ready to play the rebounded ball off the net. As soon as the ball rebounds off the net and before it falls down it should be lifted high or should be passed to the opponent court.

**Rules of volleyball game :**

- (1) The length of volleyball court is 18 mts and width is 9 mts. Attack line is 3 mts away from the centre line.
- (2) Height of net for men is 2.43 mts and for women it is 2.24 mts.
- (3) Each team may consist of 12 players in which 6 are substitutes.
- (4) Game starts with toss of coin.
- (5) At the National and International levels a five set match is played and the team that wins three sets is declared the winners. Normally people play three sets match in which the team wins two sets is declared the winner.
- (6) At the end of each set, the players change the side of ground. In the deciding set side of ground is changed at 8 points.
- (7) Each set consists of 25 points. The team that scores 25 points first will be declared winner. If scores are equal at 24-24 points, the game shall continue till the lead of 2 points is achieved by a team.
- (8) If both the teams win 2-2 sets, then 5th set will be deciding set, which will be of 15 points.
- (9) Each team is allowed maximum 6 substitution. The one or more players may be substituted at the same time.
- (10) During the play a team is allowed to play the ball maximum three times to send it over the net to the opposite side.
- (11) A player may not hit the ball two times consecutively, but blocker can play the ball immediately after the block.
- (12) Each team is entitled to a maximum of two time out per set. All time outs last of 30 seconds.
- (13) Interval between two sets is of 7 minutes. During deciding set interval is of 10 minutes.
- (14) The service must hit the ball within 7 seconds after the whistle of first reference for service.
- (15) There is no time limit for game.

**Libero :**

Libero is a special defensive player in the team. Neither he can serve smash nor block the ball, he wears different colour T shirt than other players of his team. He can not act as a captain.

When ball is dead, he can replace any one of the back line players.

A Libero can be changed any number of times after the volley is completed

The Libero must be recorded on the score sheet before the match starts.

### Exercise

**1. Write the answer in the given box of the following questions by selecting correct choice from the options given below :**

(1) What is the length of volleyball court ?

(A) 16 mts

(B) 20 mts

(C) 18 mts

(D) 21 mts

(2) Which of the following is not volley ball skills ?

(A) Tennis service

(B) Smashing

(C) Passing

(D) cant

(3) How many playing members are there in one team ?

(A) 8

(B) 9

(C) 6

(D) 7

(4) What is the duration of volley ball game ?

(A) 15 min.

(B) 20 min.

(C) 30 min.

(D) No time limit

(5) What is the height of net for men in volley ball ?

(A) 2.25 mts

(B) 2.50 mts

(C) 2.43 mts

(D) 3 mts

**2. Answer the following questions in one or two sentences :**

(1) What is the circumference of ball ?

(2) How many substitutes can be allowed at a time ?

(3) How many points are there in deciding set ?

(4) Write the different types of smashing ?

(5) When was National volleyball federation established ?

**3. Write the answers in detail :**

(1) Discuss the different types of smashing.

(2) Write the name of passing and explain any one in detail.

(3) Write the name of service and discuss the tennis service in detail.



Softball is a popular game in America. This game is invented by a member of Farra-gut Boat club George W. Hencoce in Chicago. This game began in the year 1920. This game was played in open air in Canada after that it became more popular

Up to 1895 this game was played with different names like Kitten ball, Diamond ball. Mush ball, Fatt Ball, big ball, Night ball recreational ball, play ground ball etc.

In 1900 first time official rules of the game were framed. In 1908 National rules were declared. First time in 1908 competition was organised by National amateur play ground ball association. First time this game was declared as soft ball by Walter Hensen, YMCA and National recreation congress in 1926. International committee was formed in 1933 to frame a simple and effective rules of the game. who framed standard rules of the game. Upto 1950 this game became more popular. First time world championship for women was organised in Melborn (Australlia) is 1956, where is for men it was organised in Maxico city in 1966.

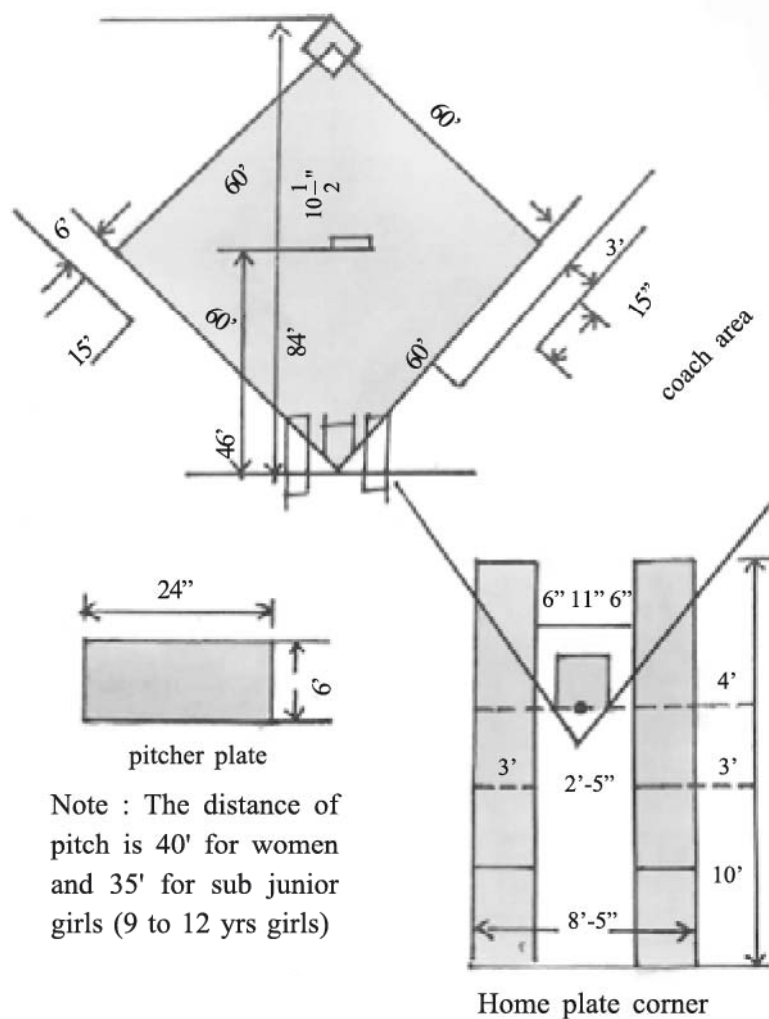
Soft ball game in India was started by Shri Dasharathmal Mehta of Jodhpur (Rajasthan). He was a member of American library. So he studied American books and literature of soft ball in library. He made softball game famous as recreational game among youth of Jodhpur. This game was spread in 1954. Dasharathmal Mehta has framed softball association on 21st November, 1961. First Inter state soft ball competetion was held under the banner of softball Association of India in 1967. In this tournament teams of Rajasthan, Delhi, Maharashtra and Andra Pradesh took part with the effort of YMCA game was spread in India.

Indian team had participated in Asian championship which was held in Japan in 1985. Men and women team had participated in Phillipaince in 1997.

This game has more recreational aspect. Because of small ground and less costly equipment the game became very famous.

This game is managed by International softball federation at world level, Head office of federation is situated in Gklahoma (USA).

**(1) Ground :** Softball ground is like kite shape. Diameter of ground is 225 feet (68.96 mts) for men and 200 feet (60.96 mts) for women. It shall be levelled and unobstructed area, which is shown in figure.



(1) Softball ground is open, levelled and unobstructed and upto 225 feet for men and 200 feet for women from home plate.

(2) For all the age groups square of 60 × 60 feet (18.29 mts × 18.29 mts) is marked.

(3) Distance between home plate and pitching plate is 46 feet (14.02 mts) for senior and junior men, 40 feet (12.19 mts) for senior and junior women and 35 feet (10.67 mts) for sub-junior women.

Pitching plate is 24 inches (60.96 cms) long and 6 inches (15.24 cm) wide. From the centre of pitching plate, circle is drawn with 8 feet radius (2.44 mts)

(4) 3 feet (0.91 mt) long line is drawn from first base towards the home plate which is 3 feet (0.91 mt) parallel to home plate and first base. Batter shall run from home plate to first base inside 3 feet line.

(5) Attack circle is drawn with 76 cm radius near the batter box for batter.



(6) Batter shall stand in batter box with slager (bat) is compulsory. Both sides of home plate 7 feet (2.3 mts) long and 3 feet (0.91 mts) wide letter box is drawn.

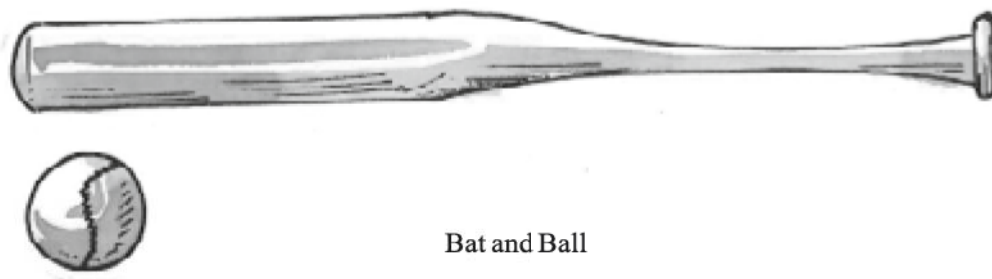
(7) Catcher box shall mark behind the home plate and letter box. The measurement of catcher box is 10 feet (3.05 mts) long and 8 feet 5 inches (2.57 mts) wide.

(8) Behind the end line of first and third base 8 feet (2.44 mts) away from the home plate parellel to base line 15 feet (4.51 mts) long coaches box is marked.

(9) Home plate shall be five sided figure. The width of plate is 17 inches (43.18 cm) long straight line is of 8 inches (21.59 cm) and bent line is of 12 inches (30.48 cm)

(10) Other bases except home plate are of 15 inches (38.10 cm) square.

**(2) Equipment :** Following equipments are used for soft ball.



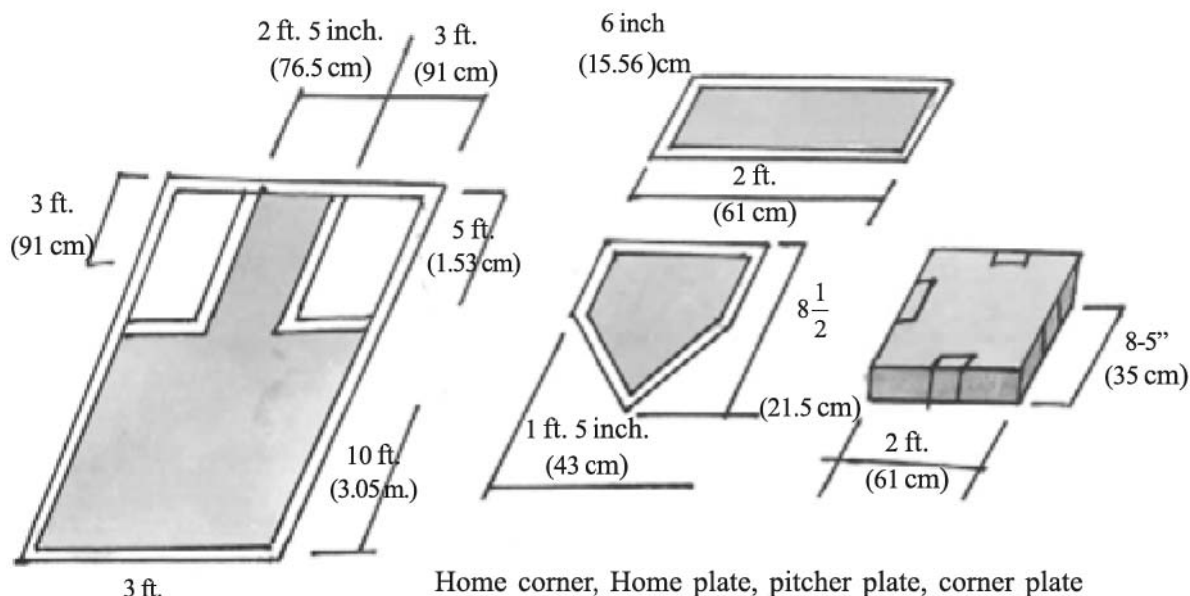
Bat and Ball

**(i) Slager (Bat) :** To hit the ball, a bat is used. The bat shall be round and shall be smooth. Front part of the bat is thick and end part shall be thin. Maximum length of bat is 34 inches. Diameter of thick part of bat is 2.5 inches. Bat shall be of metal, bumboo, plastic, fibre glass, ceramic or any other composite materials surface shall be soft and safe, shall to have a safety knot of a minimum of 0.6 mm protruding at a 90 degree angle from the handle. Approved bat by ISF shall be used.

**(ii) Ball :** Ball shall be a regular, smooth - seamed concealed stitched and flat surface ball. Shall have a centre core made of either no. 1 quality long, fibre kapok, 4 mixture of cork and rubber, a polymerethane mixture circumference of the ball shall be better  $11\frac{7}{8}$  inches and  $11\frac{1}{4}$  inches. Weight shall be between 6 once and  $6\frac{3}{4}$  ounces shall be smooth - seamed, concealed stitched or flat surface ball. If cover of ball is made of synthetic material is allowed. ISF approved ball shall be used in compation.

**(iii) Home Plate :** Plate shall be made of rubber or suitable material. It shall be a five sided figure. Plate is 17 inches wide, long straight line is of  $8\frac{1}{2}$  inches and bent line is of 12 inches.

**(iv) Pitcher's Plate :** The pitcher's plate shall be of rubber or wood. Plate is 2 feet long and 6 inches wide. The top of the pitcher's plate shall be level with the ground. It is 46 feet away from the home plate for men and 40 feet for women.



**(v) Base Plate :** The bases plate other than home plate shall be of  $15 \times 15$  inches square. Thickness shall not be more than 5 inches and shall be made of canvas or other suitable material. The bases shall be securely fastened in position.

**(vi) Gloves :** Any player may wear a gloves.

**(vii) Shoes :** A shoe shall be considered official, if it is made with either canvas or leather.

**(viii) Masks (Head Guards) :** All catchers must wear masks, throat protector and helmet. Head guards shall be made of leather and net.

**(ix) Chest Guard :** Catcher, home plate officials and women players shall wear the chest guard . It protects chest and abdomin. It shall be made from cotton, foam, rubber or thermocol and it is covered by canvas. To fix the guard belts are used. Players also use skin guards.

**(3) Skills :** Following are the main skills of soft ball game. It includes throwing, catching pitching batting, fielding, bunting, base running. In our syllabus only throwing, catching and pitching are included, but when players play the game they will also use other skills. During games teachers should taught these skills.

**(1) Throwing :** If throwing action is weak or lack of accuracy it spoils the game. The ball should be thrown correctly and fast. There are different types of throwing.

**(i) Over head throw :** Right handed thrower, player should keep left hand near the bent foot. While throwing use the body weight, keep left hand forward and throw the ball and bring right leg forward.

**(ii) Side arm throwing :** Throwing action is as per the overhead throw, but the ball should be thrown by side way.

**(iii) Underhand throwing :** Bring right hand backward to forward near the knee. Keep left leg forward and bring left hand forward and all keep right leg forward. This action shall be performed in rhythm and fast.

**(2) Catching :** A catch is a legally caught ball which occurs when the fielder catches a batted or thrown ball with his hands or gloves. A batted ball or ball is thrown by his team mates is caught will help in making player out or it also helps stopping the runs. This is a part of fielding skills. When ball is coming down the player has to think of height and speed of ball and accordingly he should run at proper place. Sometime catching action should perform moving front or back. If possible both hands shall be used to catch the ball. Keep both the palm closer both thumbs and small fingers are joined and keep other fingers open and make a cup shape. As soon as ball touches the hands take hands little back to reduce the speed of ball and should catch the ball. Sometime bending down or over head ball shall of caught by bending forward and taking jump.

**(3) Pitching :** As bowler is important in cricket to make a player out, same way pitching is also important in soft ball.

A pitch is the act performed by the pitcher in delivering the ball to the batter. It is called pitching. While performing pitching pitcher shall keep both the legs on the plate, catch the ball with both hands, extends hands towards batter. While throwing the ball, keep left leg forward, take right hand backward and forward then leave the ball between knees and shoulders of batter, ball should have also passed over the home plate.

The action of pitching should be performed with alertness. If pitcher delivers right of effective ball then batter can not hit the ball easily. Pitcher shall spin the ball or throwing the ball fast to make a batter confused.

**(4) Officials in Softball :** Following are the officials in softball :

(1) Home Plate Umpire

(2) Base Umpires

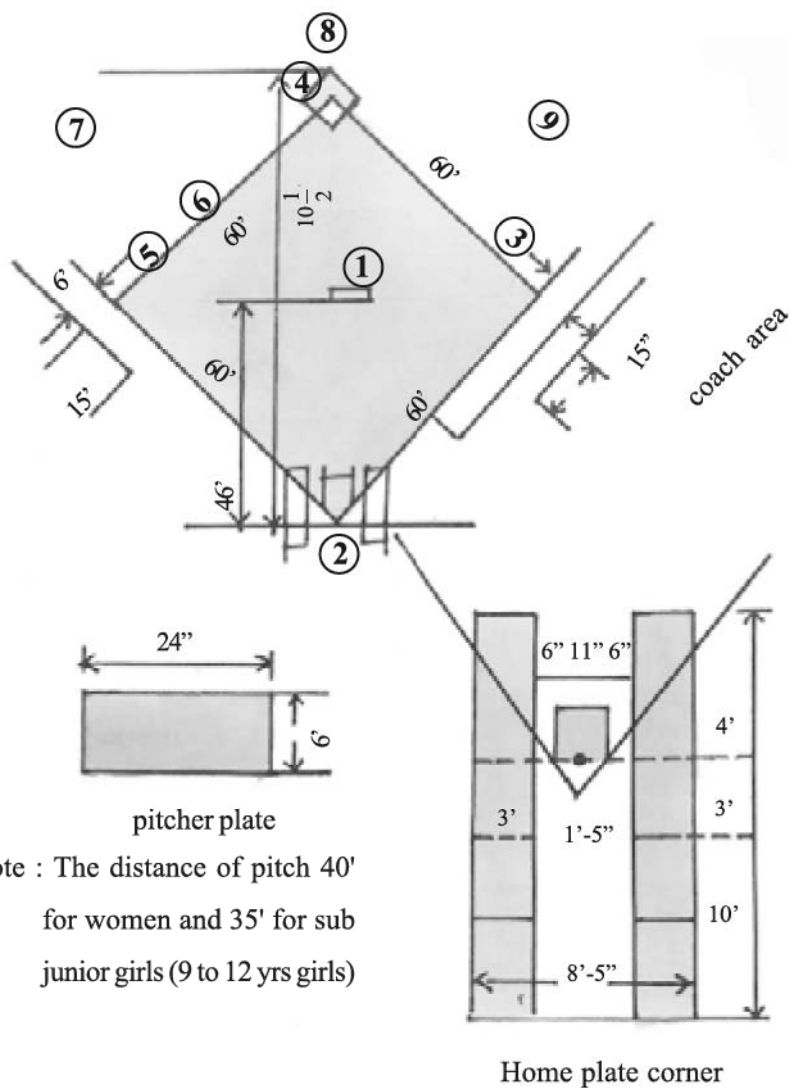
(3) Scorer

**(5) Rules of Softball Game and competition :**

**Players and Substitutes :**

**(1) Team :** A team consists of 9 players, 6 substitutes, one manager and a coach.

**Position of the players :** A team shall consist of 9 players in the following positions - It is also shown on the ground by numerical value.



- (1) Pitcher
- (2) Catcher
- (3) First Base-man
- (4) Second Base-man
- (5) Third Base-man
- (6) Short Stop
- (7) Left Fielder
- (8) Centre Fielder
- (9) Right Fielder

**(3) Line up Sheet :** Official line up sheet is to be completed and submitted to the official scorer by the coach manager duly signed.



**(4) Uniform :** All players on a team shall wear uniforms alike in color, trim and style. All players of the team shall wear same colour T-Shirt, full pant or half pant. Shoes are compulsory for all the players-men can wear caps and women can wear head bands. An Arabic number of contrasting colour at least 15 cm (6 inches) high must be worn on the back of all uniform shirts.

**(5) Play :**

(1) A team must have the 9 players present in the team area to start or continue a game.

(2) The choice by the first or last bat in the inning shall be decided by a toss of a coin.

(3) Players of batting side shall sit on the bench.

(4) Fielding team shall take the position on the ground. Pitcher near the pitching plate, catcher in catchers box, first base runner on first base, second base runner on second base, third base runner on third base short stopper near the pitcher, left fielder at left side ground, center fielder in the centre of the field, right fielder at right side ground..

(5) A regulation game shall consist of seven innings. Each team shall play seven innnings alternative.

(6) Three players of batting team declared out then inning of that team is over. Full run till third player declared out shall be recorded.

(7) One run shall be scored each time a runner legally touches first, second third bases and home plate before the third player out of the inning.

(8) The batting order of each team must be on the score sheet before game start. The batting order must be followed through out the game. The first batter in each inning shall be the batter whose name follows that of the last player who completed a turn at bat in the preceding inning.

(9) If required substitution shall be made during the half inning.

(10) Team which scores more run at the end of game shall be declared winner.

(11) A full seven innings need not be played if the team second at bat scores more runs in six innings or before the third out in the last of the seventh inning.

(12) A game that is tied at the end of seventh innings shall be continued by playing additional inning. The team which scores more runs shall be declared winner if till tie remains, then one inning shall be played untill one side shall score more runs.

(13) If game is delay due to darkness, rain, fire or for any other reason, then plate umpire may forfeit the game. In this situation if five or more complete innings have been played or if the team second it bat has scored more runs then the other team has scored in five or more innings. A regulation tie game

shall be declared if the score is equal when the game is called at the end of five or more completed innings.

#### **(6) The Rule of Pitching :**

(1) Must have both feet on ground within pitching plate. The hips shall be in line with first and third bases and both feet must be in contact with the pitcher's plate. After having the ball in both hands in the pitching position (Minimum 1 sec and Maximum 10 sec) he removes one hand from the ball, takes a backward and forward swing and returns the ball to both hands in front of the body. The delivery must be an underhanded movement. In the act of delivering the ball, the pitcher may take one step with the leading - non-pivot foot simultaneously with the release of the ball.

(2) Pitcher shall not pitch the ball, if catcher is not in catcher's box.

(3) Pitching ball must pass over the home plate and between the knees and shoulders of batter then it is count as correct ball or strike otherwise it shall be ball.

(4) Pitcher while pitching shall not allow any bandage, sticker, adhesive or greasy substances on the hands or finger.

(5) The delivery must be an underhand motion with hand below the hip and wrist shall not further from the body than the elbow.

(6) When batter takes his position in batter box and home plate umpire shall declare 'play', then only pitcher shall deliver the pitching.

(7) Pitcher shall not throw the ball to the base after he shall take the position on the pitching plate.

(8) When game is stopped for any reason and pitcher shall pitch the ball. It shall not count the pitching.

(9) While delivery, if pitcher loses the ball from his hand, then the base runner can move to next base on his responsibility.

(10) In the opinion of the manager or coach if pitcher is not performing correct delivery he can request the plate official to change the pitcher.

(11) Before start of inning or any time during the game the team wants to change the pitcher, then game shall be discontinued. Change of pitcher shall be completed within one minute.

#### **(7) The Rules of Batting :**

(1) The batting order of each team must be according to the score sheet / line up sheet.

(2) Batter shall enter in the batter box with standard bat only.

(3) Batter shall take position in batter box for batting.

(4) Batter shall take one step forward without touching the homeplate.

(5) While fielding catcher or fielder shall throw the ball but he shall not hit the ball.

(6) When pitcher has delivered incorrect ball or foul ball, then batter can not hit.

(7) When correct ball is delivered, then only batter should hit the ball.

**(9) In the following situation batter shall not be out :**

(1) If incorrect ball shall hit and batter shall run.

(2) Ball is declared incorrect ball.

(3) If throwing ball is stopped by manager or coach.

(4) If home plate umpire shall obstruct the ball.

(5) If batter shall miss the ball to hit and touches to his any part of body.

(6) Because of the obstruction if batter or base runner shall call back to his position.

**(10) In the following situation batter shall be out :**

(1) If batter shall not enter the batter's box within a minute after a call by umpire.

(2) If fielder catches the ball, which is not a foul tip.

(3) If three strikes are over.

(4) If ball shall hit by batter and ball shall reach to first base runner before batter reaches to first base.

(5) If ball shall hit by batter and ball shall catch by any fielder.

(6) While hitting the ball, if he leaves the box.

**(11) Rules of Runner Out :**

(1) A fair batted ball is caught and base player leaves the base.

(2) If ball shall hit by batter and ball shall reach to first base player before batter reaches to first base.

(3) While running towards the base, if he hits the ball by foot intentionally.

(4) If ball reaches to first base runner before batter reaches to base.

(5) If batter shall not touch the base.

(6) If hit ball is caught and base runner does not return back to their original base and inbetween he his touched by ball.

(7) Base runner shall run before pitcher pitches the ball.

(8) If batter runs ahead of base runner.

(9) In motion if runner after touching the base goes forward he shall not declare out but he further want to run towards second base, then he shall touch the first base.

**(12) No ball, foul ball, Dead ball :**

**(A) No Ball :** No ball shall be declared if pitching ball should not pass over the home plate, above the shoulders, below the knees, touches the ground before reaches to batter, if he leaves the pitching plate while ball delivered from the pitcher's hands.

**(B) Foul Ball :**

- (1) Hit ball goes out of ground.
- (2) Hit ball after touching first and third base and goes out of ground.
- (3) Hit ball touches the officials or players who are out side the grounds.

**(C) Dead Ball :**

- (1) When the ball is batted illegally.
- (2) When pitcher shall be ready for pitching and batter shall leave the batter box.
- (3) When not pitch is declared.
- (4) When pitched ball touches any part of the batter's body or clothing.
- (5) Hitted ball goes to foul zone.
- (6) Before pitcher pitching the ball base man starts running, he shall be declared out.

**(13) Scoring of Runs :**

- (1) One run shall be scored each time a runner legally touches first, second and third base and home plate before the third batter shall declared out of the inning.
- (2) If batter being forced to run towards first base and first base runner has to run forward and if he without touching the next base runs forward shall be declared out.

**Exercise**

**1. Answer the following questions in detail :**

- (1) Why does chest guard used in softball game ? How is it made of ?
- (2) Describe the throwing skill in Softball.
- (3) Explain the catching skill in Softball.
- (4) What do you mean by pitching in Softball ? How is it performed ?

**2. Write short notes :**

- (1) Home Plate



- (2) Slager (Bat)
- (3) Ball
- (4) Base Plate
- (5) Uniform of Soft Ball players.

**3. Answer the following question in one or two sentences :**

- (1) How many players are required to start the game of Soft Ball ?
- (2) How many innings shall be played in Soft Ball ?
- (3) How pitcher shall stand before pitching ?
- (4) When correct pitching is called ?
- (5) Which position batter should take while pitching ?

**4. Answer the following questions by selecting correct choice from the options given below :**

- (1) What is the measurement of Soft Ball square ?
  - (A) 40 feet  $\times$  40 feet
  - (B) 60 feet  $\times$  60 feet
  - (C) 50 feet  $\times$  50 feet
  - (D) 55 feet  $\times$  55 feet
- (2) What is the maximum length of sluger (Bat) ?
  - (A) 25 inches
  - (B) 30 inches
  - (C) 34 inches
  - (D) 40 inches
- (3) How many sided home plate is ?
  - (A) 5
  - (B) 4
  - (C) 3
  - (D) 2
- (4) What is the measurement of base plate ?
  - (A) 8 inches  $\times$  8 inches
  - (B) 10 inches  $\times$  10 inches
  - (C) 12 inches  $\times$  12 inches
  - (D) 15 inches  $\times$  15 inches
- (5) Where is the centre fielder will take position ?
  - (A) Behind the second ball on the ground
  - (B) On the second base
  - (C) On the third base
  - (D) On the first base
- (6) Where the player numbers should be shown ?
  - (A) In front of T Shirt
  - (B) Left side of T Shirt
  - (C) Right side of T Shirt
  - (D) Back side of T Shirt
- (7) What is the measurement of number on the T Shirt ?
  - (A) 4 inches
  - (B) 5 inches
  - (C) 6 inches
  - (D) 7 inches

- (8) What is the distance of pitching plate from the home plate for senior men ?
- (A) 40 feet                      (B) 45 feet                      (C) 46 feet                      (D) 35 feet
- (9) Where does batter stand ?
- (A) On the base plate                      (B) On the pitcher's plate
- (C) In the batter box                      (D) In the home plate
- (10) When pitcher starts pitching ?
- (A) When home plate umpire given order of play    (B) When catcher is in catcher box
- (C) When team manager declares                      (D) When team captain declares

Activity

- Draw softball ground and indicate the positions of fielders.

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### Preface

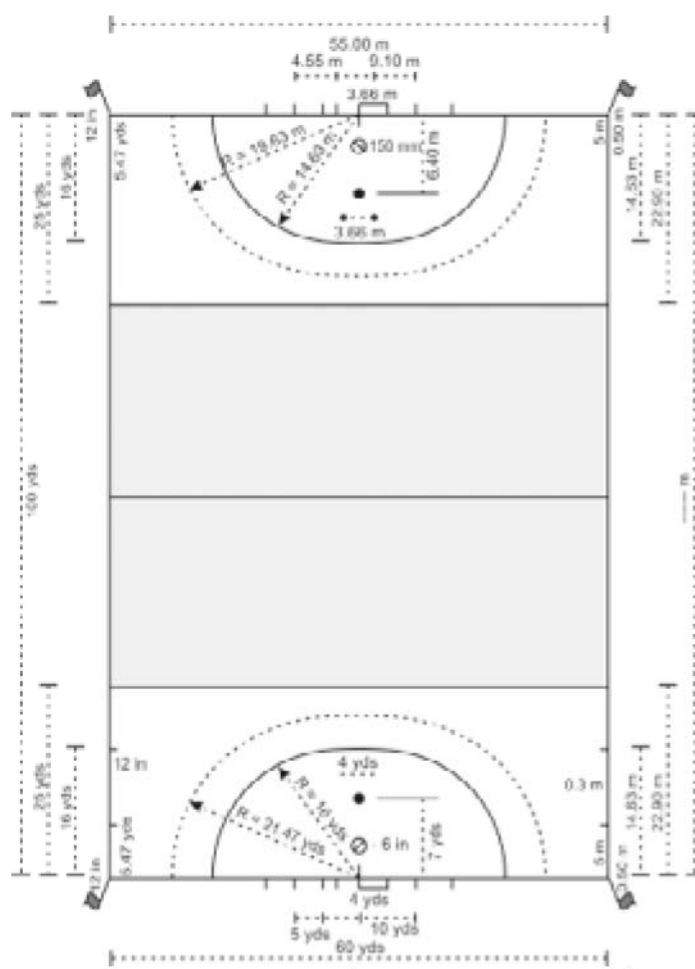
Though cricket is most popular game in India, our National game is Hockey. When is this game started for that there is no evidence found. It is presumed that in ancient time, a game played with bent rounded stick and ball who played in PARSHIYA. This game derived from Parshiya to Greece and Rome.

Hockey word is derived from the french word 'Hotic'. Hotic means a stick rounded at one end. In India this game was being played in the times of Mahabharat in the form of 'Gedi-Dada' American 'Auka' Japanees 'Kanchi', Scottish 'Shinti' games are almost similar to Hockey.

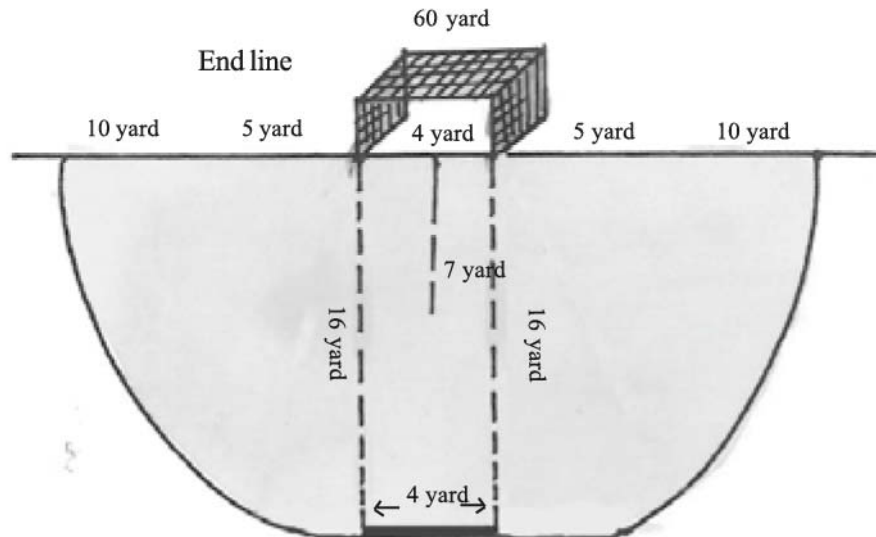
Modern Hockey game has been presented by England to the world. In 1861, the first world Hockey club was established in Blackkith. In 1875 the first world Hockey conference was organised in England. The rules of Hockey were framed in this conference. In India, hockey game was started by English Military officers in Kolkata in 1885. This game was introduced in Olympic game for the first time in 1908. All India Hockey Association was established in 1925-26. India participated in 1928 Olympic games organised in Amstardum. India had won gold medal in this Olympic game. Since then (1928) India had been winning the gold medals continuously upto 1956 Olympic games. In 1964 and 1982 Olympic games also India had secured gold medals. In getting maximum gold medals, the contribution of Hockey vizard Dhyanchand was the greatest. In reality his contribution was Gupara Ibel.

### The Hockey Ground

The hockey ground is a rectangular field. The measurement of hockey ground is decided in yard, foot and inch at International level, but the measurements are also given in Metric system metre-centimeter-millimeter in the figure. The detailed of the ground with measurements are given in the figure.



The Hockey Ground (As per metre and yard)



### Shooting Circle

(1) The hockey ground is a rectangular field. Its length is 91.40 m (100 yards) and its width 55 m (60 yards). The surface of the ground should be flat and levelled, without pits and bumps. The lines on the length side are known as 'side lines' while those on the width side are called 'goal lines'. The thickness on the end-lines and side lines is 7.5 cm (3 inches). All these lines are regarded as part on the playing field. At the National as well as International levels the surface of the ground is made of synthetic substances like 'Astra turf'.

(2) The Central or Middle line joining the two side lines is drawn at the middle of the ground and parallel to the Goal lines. It divides the hockey ground into two equal parts. Each part is called a 'Court.'

(3) Between the Goal lines and the Middle line, at a distance of 22.5 m (25 yards from the goal line and parallel) to the central line, two lines are drawn which join the side lines. These are known as the 25 yard lines.

(4) Near all the four corners of the ground at a distance of 4.55 m (5 yards) marks are made for 'corner' on the Goal lines and the Side Lines.

(5) Taking a radius of 14.63 m (16 yards) from the centre of each goal line, circular lines (arcs) are drawn on both the sides where by a shape like 'D' is formed on the front side of the goal post. These lines or arcs are joined a straight line 3.65 m (4 yards) long. This D shaped area is called the 'shooting circle'.

(6) At a distance of 4.55 m (5 yards) and 9.10 m (10 yards) marks for the penalty corner are made on both sides of the goal lines.

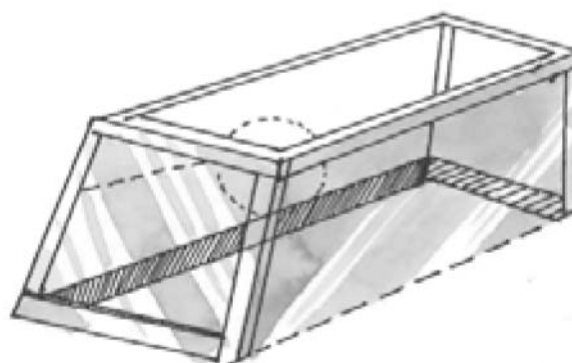
(7) From the centre point of each goal line 'penalty Stroke Points' are marked on the ground.

(8) Parallel to the shooting circle and outside it two semi-circles are drawn on the ground with broken lines at a distance of 19.63 m (21 yards) from the centre of the Goal Line with a radius of 19.63 m (21 yards). On all the corners of the ground flag posts are fixed which are 1.20 to 1.50 m about the ground in height and flags 300 mm × 300 mm are fixed on the flag posts.



## Goal

The goal Posts are fixed on the ground at a distance of 1.83 m on either side of the central point of both the goal lines so that the inside distance between the two posts is 3.66 m (4 yards). The height of each post above the ground is 2.14 m. A horizontal crossbar is fitted on the top of the Posts. This cross bar is 7.5 cm broad and 5.1 cm thick, having a rectangular shape. The goal Posts and cross-bars are painted white.



Goal and Goal boards

## Back-boards (Goal Boards) :

To stop the ball after it enters the goal a back-board is placed behind the goal. The length of the back-board is 3.66 m (4 yards) and its width 1.22 meter and the height is 46 cm. It is painted on the inside in a dark colour.

## Net

As shown in the Picture a net is fixed at the backside of the goal Posts and the back-boards. The net is made of strong thread and each knitted square is about 45 mm wide.



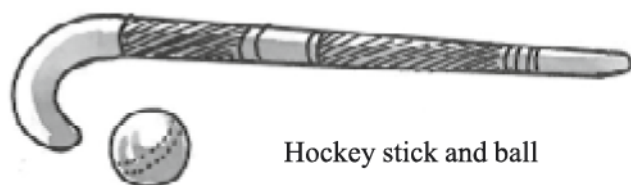
Net

## Equipment

### Hockey Stick :

The left side of the stick and the bend portion at the bottom should have a flat surface. The length of the stick should be between 75 cm to 93 cm (33 to 37 inches) and its weight should not be less than 12 ounces or more than 28 ounces.

The entire stick should pass through a ring with a circumference of 5.08 cm (2 inches). Metal is not used in preparing stick. The stick is made by joining two pieces of wood, so that it has some flexibility.



Hockey stick and ball

## Ball

The outer colour of the ball should white made from leather or some synthetic material. The circumference of the ball must not be less than 22.4 centimeter ( $8\frac{13}{16}$  inches), nor should it be more than 23.5 cm ( $9\frac{1}{4}$  inches). The weight of the ball must be not less than 156 gm ( $5\frac{1}{2}$  ounce) or more than 163 gm ( $5\frac{3}{4}$  ounce).



Ball

## Pads and Gloves for the Goal-Keeper

During a game the goal keeper can wear specially made pads or log guards on both his legs to protect his legs from the being injured. Similarly, he can wear hand gloves to be able to stop the ball without causing injury to his hands.

## Chest Guard

With a view to protecting himself from injury likely to be caused to the chest by a bumping ball, a goal-keeper can wear a chest guard.

**Helmet :** A goal-keeper can wear a helmet to protect his head from being injured by ball bumping high.

## Shin guard (Shin bone guard) :

During play, the shins of the players are likely to be hit and injured by the sticks of the opponents or the ball so in order to protect the shin bones shin guards can be placed inside the stocking used by the players.



Goal-Keeper's  
Pads and shoes

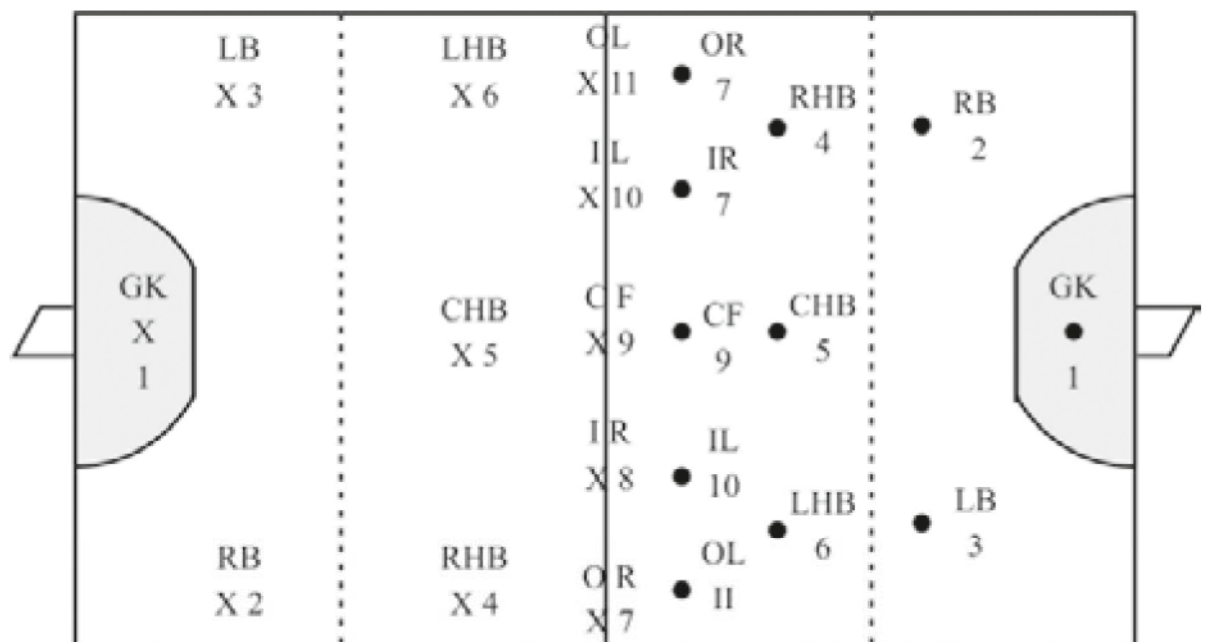
Fully equipped goal-Keeper  
(front view and side view)

## PLAYERS :

There are 16 Players in each team. Of these 11 players are actually on the ground during play, while five stay out as substitutes. These eleven players take their position at their appointed places and each player is known by the position he occupies on the ground at the start of Play.

These Positions are as follows

(1) Goal-Keeper (G.K.) (2) Right Full Back (R.B.) (3) Left Full Back (L.B.) (4) Right Half Back (R.H.B.) (5) Centre Half Back (C.H.B.) (6) Left Half Back (L.H.B.) (7) Out-side Right (O.R.) (8) Inside Right (I.R.) (9) Centre forward (C.F.) (10) Inside Left (I.L.) and (11) Out-Side Left (O.L.).



Positions of the Players on the ground

## Skills of the game :

**Dribbling:** This is a basic skill of hockey. Due to this skill one can control on the ball and he can move speedy with ball.

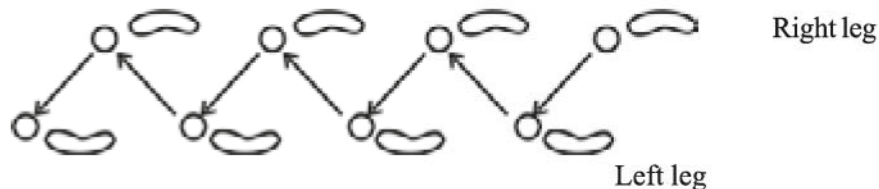
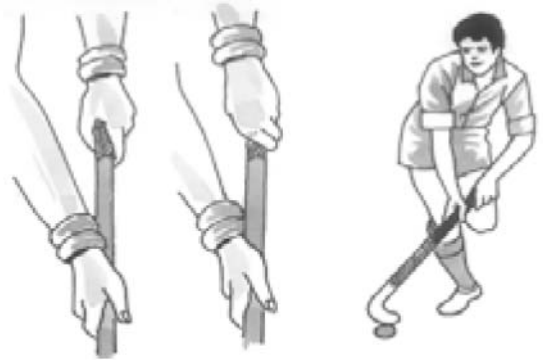
### Teaching steps

**Grip of the stick :** The stick should be gripped with the left hand at the upper end of the stick in such a way the flat side of the stick stays on the left side. The stick should be held at the middle part in a loose grip of the right hand. So that while dribbling, the stick can be quickly moved in either direction with the left hand.

**Body Position :** The legs should be in wide-spread. The body should be bent forward from the waist. The eye sight should be fixed mainly on the ball.

**Position of the ball :** Keep the ball at a distance 24 to 30 cm in front from the front leg.

**Dribbling Action :** First put one leg on the front side, and then dribble the ball at an angle of  $45^\circ$  in the opposite direction of the front leg. Then putting the other leg in front, dribble the ball at an angle of  $45^\circ$  in the opposite direction with reverse stick. Thus dribble the ball and go ahead



### Hitting (Striking the ball)

There are various types of hitting, for example the straight hit, the reverse hit, hit on the wrong foot etc.

#### Straight Hit :

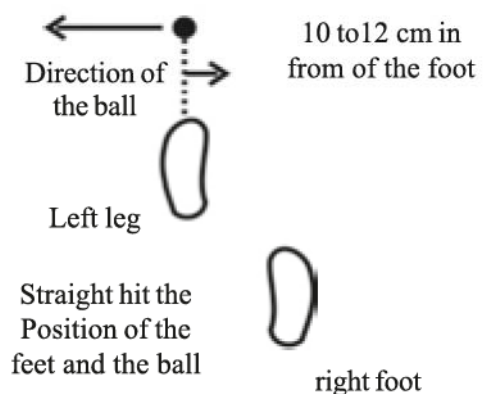
The action of hitting the ball to send it straight in the forward directions is called the straight hit.

#### Teaching Steps :

##### The Grip of the stick :

Leaving a 10 to 12 cm portion at the top of the stick, the stick should be held tightly with the left hand in such a way that the flat side of the stick is turned towards the left side. Then placing the right hand just below the left hand and just touching hit, take a strong grip on the stick with the right hand

**Position of the body :** Place left foot forward. Most of the weight of the body should be on the left foot. The right foot should be placed slightly at the back of the heel of the left foot. (It will also do if toes of the right foot are placed in such a way that then touch the ground). The body should be bent in the forward direction. The eyes should be on the ball and the left shoulder will be turned in the direction in which the ball is to be hit.





**Position of the ball :** The ball should be placed at a distance of 10 to 15 cm.

**The Action (of hitting) :** Raise the stick in the back ward and upward direction on your right hand side, and bringing it down quickly in the same way hit the ball using the strength of the wrist with the middle part of the bent part of the stick. Take care to see that the stick does not normally go above the level of the shoulders before or after hitting the ball.

**The follow through action :** The stick should be taken in the same direction in which the ball has been put and then the body should be turned in the direction of the ball.

### Stopping :

This is a very important skill. It is essential that the player has the self-confidence to be able to stop the ball. Stopping can be done in various ways. For example, stopping the ball coming from the opposite direction, stopping the ball coming from the right side, stopping the ball coming from the left side, stopping the ball coming through the air etc., Here we will see the stopping the ball coming from the front.

**Grip of the stick :** Hold the stick firmly with the left hand at the top end of the stick. Grip the stick slightly loosely in the middle part with the right hand in such a way that the flat side of the stick is in the direction from which the ball is coming.

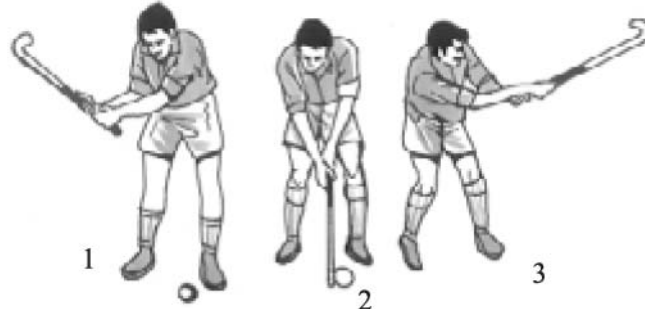
**Positioning of the Body :** Both feet should be placed at a natural distance near each other. The weight of the body should be kept on both the legs. The body should bend forward from the waist as needed and the eyes should be on the ball coming from the opposite direction.

**Action :** When the ball is within the reach of the stick, holding the stick in such a way that its flat side faces the ball, the ball should be stopped with the flat side of the stick. As soon as the ball touches the stick, the stick should be pulled a little behind with right hand so that the ball, after striking, will be stopped nearby.

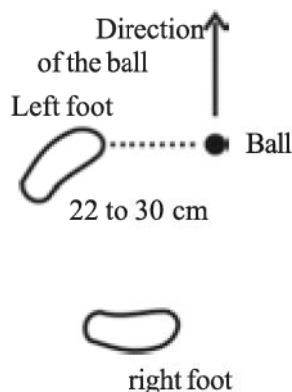
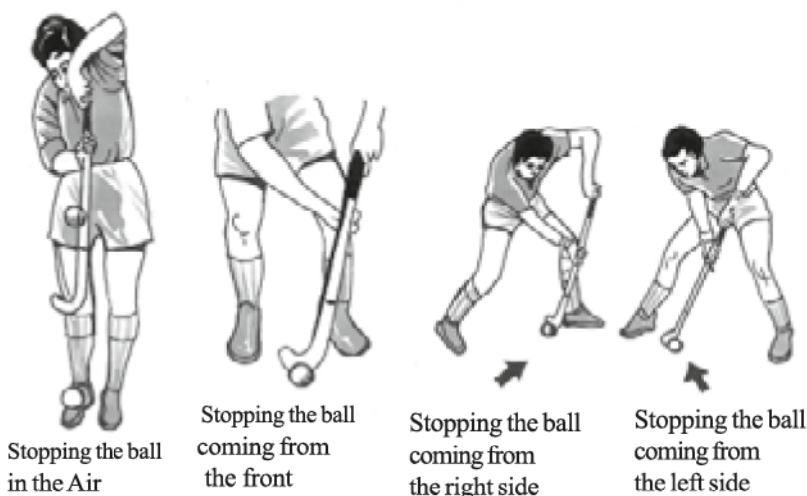
### Pushing : Straight Push :

In this skill the stick is placed touching the back side of the ball and the ball is pushed with the stick. The different types of pushes are; straight push, sweep push etc.. Here we will discuss for pushing the ball forward, which is called the straight push.

**Grip of the stick :** Hold the stick firmly with the left and at the top end of the stick and grip it in the middle with the right hand in such a way that its flat part faces the left side.



Various positions of the body before hitting the ball at the time of touching the ball and after hitting the ball.



Straight push-Grip at the stick and Position of the body



**Position of the Body :** Place the left foot forward in such a way that the toes are in the direction in which the ball is to be pushed. Place the right foot behind the left foot at a distance of 45 to 60 cm such a way that both the feet are at an angle of 45 degrees. The body should be leaning in the front in the direction of the ball. The entire weight of the body should be on the right foot before passing the ball and on the left foot after pushing the ball.

**The Position of the Ball :** The ball should be placed on the ground in front of the toes of the left foot, slightly on the right side 30 to 40 cm away.

**Action :** Three types of action are to be performed almost simultaneously.

- (1) Push the ball forward with the stick with the help of the arm.
- (2) Transfer the weight from the right foot to the left foot.
- (3) Turn the body also in the particular direction in which the ball in the front is pushed. If all the three actions are synchronized, the ball can be pushed in the desired direction.

**The follow-through Action :** Extend the stick in the direction in which the ball has been pushed and turn the body in the direction in which the ball is pushed and straighten it.

### Flicking :

The ball is tossed with the stick in such a way that it passes over the opponent's stick and remains in motion even after falling on the ground. Generally, the ball is tossed with the stick knee high or even chest high.

This action is called the 'Flick'. The different types of Flicking are. Flicking the stable ball, Flicking the rolling ball straight stick, reverse flick etc. Here we will see the straight flick.

**Straight Flick :** In this skill the ball is tossed with the stick straight over the opponent's stick.

**The Grip of the stick :** Grip the stick fully the upper end with the left hand while grip it slightly above the middle part with the right hand in such a way that the flat surface of the stick faces the left side.

**The Body Position :** Place the left foot forward in such a way that its toes point towards the direction in which the ball is to be flicked. Right foot should be placed behind the left foot in a distance of 1.5 to 2-0 feet  $\frac{3}{4}$  of the weight of the body should be on the left foot, while  $\frac{1}{4}$  of it will be on the right foot. The body will be bent from the waist in the forward direction and sight will be in the direction of the ball.

**The Position of the Ball :** The ball should be placed near the toes on their front side at a distance of 45 to 60 cm.

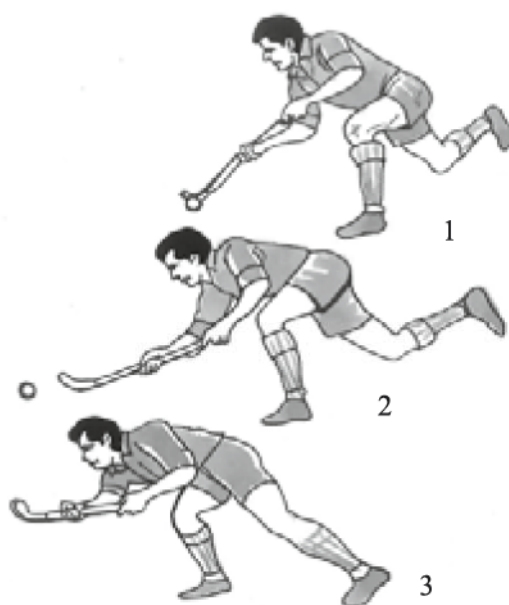
**Action :** The middle part of the curved part of the flat side of the stick should be placed just below the ball, touching it, in a slanting Position. Then, with the left hand, push the stick at the bottom towards the front side. At the same time pull the stick upwards with the right hand.

**The Follow Through Action :** Extend the stick on the front side straight in the direction in which the ball is travelling after being tossed, so the ball will not change direction.

### Scooping

The action of sending the ball towards one's team-mate by tossing it higher than the opponent's head is called 'scooping'. When it is not possible, to send the ball to a team-mate by pushing or hitting it with the stick, this skill is being used.

There are various ways of scooping, for example : (1) straight scoop (2) Reverse scoop (3) Push scoop. The push scoop is mostly similar to straight flick. The straight scoop is being done differently. We will see here



Various positions before, during and after flicking

the straight scoop.

**The Grip on the stick :** Hold firmly with the left hand at the upper end of the stick, Grip it at the middle with the right hand. The flat part of the stick should face the sky.

**Position of the Body :** Place the left foot forward in the direction in which the ball is to be tossed. The right foot should be placed behind the left one on the side 45 to 60 cm distant from it. Most of the weight of the body will be on the right foot in the beginning. The right leg will be bent, at the knee and the sight will be on the ball.

**The position of the Ball :** The ball should be placed on the front side of the forward foot at a distance of 15 to 25 cm from the toes of the leg.

**Action :** Put the rounded, flat part of the stick, behind the ball. Pushing the left hand stick downward, pull it at the same time upward.

**The Follow Through Action :** The stick should be raised in the direction in which the ball is tossed, taking care to see that the stick does not go higher than the shoulder. The body should be strightend.

### Tackling

This skill is used to take the control over the ball from an opponent, If a ball is not snatched, the player tries to intercept the speed of opponent in this, he will give a chance to his player to adjust in a suitable place.

There are may methods of tackling, for example, shadow tackling, Lunge tackling, as a last defender etc.



Push-Scoop



Shadow Tackling



Lunge Tackling

**Shadow Tackling :** In this type of tackling, a defending player will run along with the attacker like the latter's shadow and will create obstruction in attacker's way. A soon as an opportunity arises, he will try hard to snatch the ball from the opponent. In this way he will continue to shadow the attacker and slow down his (the attacker's) progress until he succeeds in getting possession of the ball or until his team mates have taken tactically advantageous positions on the ground.

**Lunge Tackling :** In this skill the defending player moves one forward and holding the upper part of the stick with only one (left) hand extends the stick forward. When the attacker raises his stick to hit the ball, the defender quickly takes the ball in his possession or passed the ball away from the attacker with his extended stick.

**Tackling as a last Defender :** When there is no player except Goalkeeper behind the defender, the defender gives his suitable open place to the attacker who is coming with ball. So that the attacker entices to forward in that direction with ball. During this the defender runs with attacker and snatches the ball and gets the control on it. Where attacker raises the stick for hitting the ball or he tries to pass the ball, he tries to snatch the ball.

### **DODGING :**

The action of moving ahead with the ball by confusing and deceiving the opponent is called 'Dodging'. This action particularly needs agility and speed on the part of the dodger. Dodging is done in many different ways.

**Dodging on the Defender's Right side :** The skill of moving ahead with ball after dodging the opponent by his right side when the opponent comes near you to snatch the ball from you, before he comes within the reach of the ball you should pretend, with a deceitful movement of the stick that you are taking the ball by his left side. You should actually move ahead with the ball by his right side after confusing and deceiving him with your action.

If another opponent comes to snatch the ball from you, you can dodge him in the same manner and move ahead towards the opponent's goal with the ball.

**Dodging on the Defender's left side :** In this action you have to move ahead with the ball by the left side of the opponent after confusing him. When you are facing an opponent who approaches you with a view to snatching away the ball from you, before he succeeds in coming within the reach of the ball, you will pretend to proceed further by the right side of the opponent, so that he will move in to that direction. At this time you will reverse the stroke suddenly on your right side and tap the ball with the reverse stick on the left side of the opponent. Having deceived him, you will proceed further with the ball.

Similarly, if another opponent approaches you, you will tap the ball again on your right side and will proceed with the ball by the left side of the opponent.

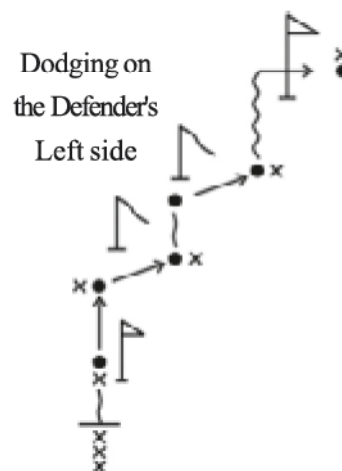
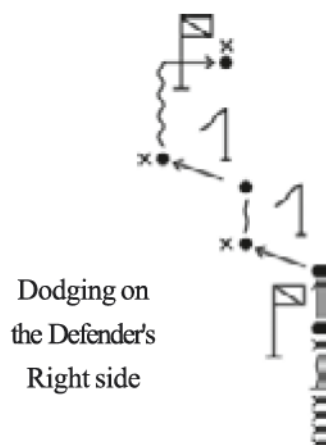
### **Passing :**

The skill of sending the ball rolling towards one's treatment using various techniques is called passing. The various passes are explained below.

**Through Pass :** When the situation is favorable for sending the ball from between two opponents to your teammate, the ball is passed to the teammate by passing the opponents standing in between.

**Return Pass :** When your team-mate is facing an opponent, he passes the ball to you. Finding an opportunity, you pass the ball back to the team-mate who had sent it to you.

**Back Pass :** When the situation is not favorable for proceeding towards the opponents goal with the ball, the ball is sent towards the team-mate who is on your back side. This action is called the 'Back Pass'.





**Parallel Pass :** Particularly when a player on the right outside or left outside reaches near the goal while playing and when he is not in a position to score a goal, he passes the ball to team-mate running parallel to him in the striking circle in a parallel line so as to enable that team-mate to convert the ball into a goal. This action of passing the ball in a parallel line is called the 'parallel pass'.

### **Forward Pass**

The action of passing the ball with the stick towards the teammate who is ahead of you during play is called 'Forward Pass'.

### **Bully :**

In this skill two players from the opposing teams (one from each) stand facing each other with their feet parted with the ball placed on the ground between them. Then each of them raises his stick and touches the ground with it. This action is done thrice. After this the player who gets an opportunity gains possession of the ball. There are various techniques of getting possession of the ball after performing the Bully. Some of these skills are as under :

(1) Pushing the ball with the reversed stick, It is sent to the team-mate of centre half player.

(2) The ball is pushed towards the team-mate standing near the opponent in the forward direction. The ball passes from between the stick and the legs of the opponent.

(3) The player participating in the Bully himself dodges his opponent and with agility takes possession of the ball and moves forward.



Players exchanging  
Bully

### **Goal-Keeping**

The art of goal-keeping is the heart of the game. A Good goal-keeper brings victory to his team, for the main responsibility of saving goals is on his shoulders. Good and skilful goal-keeping can be done by goal-keeper who possesses qualities like the power of reaching the correct inference in the ever changing circumstances during play, courage, logical thinking, the power of making quick decisions and a sharp eye-sight.



The goalkeeper trying to stop the ball going  
in the goal post



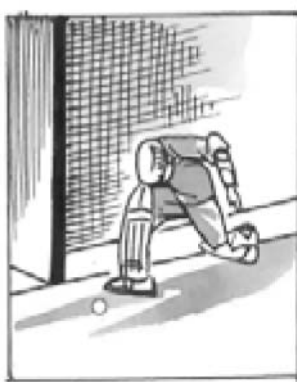
A goal keeper kicking the  
ball to prevent a goal

The goal-keeper has special privileges inside the striking circle. He can stop the ball with any part of this body. He can stop the ball with his feet or even kick it. Generally, the ball should be sent to a vacant area on the ground or towards a player of his team. If it is not possible, he should send the ball outside the ground, beyond





(1)



(2)



(3)

the side. The goal-keeper must not send the ball out side the ground from his goal-line.

(1) A goal-keeper stopping the ball with his stick (2) A goal-keeper protecting his goal by kicking the ball away. (3) A goal-keeper stopping the ball in the air.

### Rules of Hockey

**Game Time :** The playing time is divided into two halves of 35 minutes each. A rest period of 5 minutes is given between the two halves. If both the captains agree and the referee gives his consent the rest period can be of 10 minutes. If any time is lost during the play, the play can be extended by the time lost.

#### The starting of a game :

(1) Before play commences the ground or the 'centre pass' is decided by tossing a coin. The captain of the team winning the toss can choose between the ground or the centre pass. The team which was lost the toss has to accept the other option.

(2) At the time of starting the game with centre pass all the players except the player who is to start the play, will take their respective position in their own half of the ground.

(3) The centre pass is done either with a push or a hit, whichever is convenient to the starter. He can pass the ball to any part of the ground that he likes.

(4) At the time of the centre pass, all the players of the opposite team should be at least 5m away from the player who is executive the centre pass.

(5) Only after the ball passed or hit has travelled the distance of 1m can any player, except the one who has executed the centre pass, play the ball. Only after it has been played by another player, the player who has executed the centre pass can play it again.

(6) After a goal has been scored, a player belonging to the team against whom a goal has been scored can start the game again through a centre pass.

(7) Before beginning play in the second half of the game, both the teams exchange their sides of the ground. A player from the team whose opposite team had started the game in the first half will start the game in the second half with a centre pass.

**Substitution :** There are 16 players in each team of whom 11 actually participate in the play on the ground. During a game (except when a penalty corner is awarded to a team) any number of substitutions can be done. But if a player has been sent out as punishment, he cannot be replaced by a substitute.

**Goal :** When a member of the attacking team hits a ball with his stick from the shooting circle while he is in the defender's half and sends it across the goal-line and inside the goal posts, the attacking team is said to have scored a 'goal'.

### **General Rules of Hockey**

- (1) The ball can be played only with the flat side of the stick
- (2) When there is a player within a distance of five metres no player will hit the ball dangerously or in such a way that it will cause injury to another player.
- (3) No other player but the goal-keeper can stop or play the ball except with a hockey stick. Only the goal-keeper is allowed to stop the ball with any part of his body and even kick the ball away.
- (4) No player will obstruct an opponent with his stick or any part of his body. He will not also come in between the opponent and the ball or pass from between them.
- (5) If during play, the ball dashes against the Referee or if the ball hit by a player hits the goal post and returns to the ground, it will still be regarded as being in play.

### **Free Hit :**

- (1) Generally, if a rule is broken in any part of the ground except the shooting circle, the party opposing the one that has committed the breach is given the chance of putting the ball in play against with a 'free hit' executed from the spot where the breach was committed.
- (2) When a player is executing a 'free hit' all the players in the opposite team are required to stand at least five metres away from the 'hitter'.
- (3) A ball is hit by a free hitter, he (free hitter) will not play the ball again until another player of any team plays it.
- (4) While executing the free hit the ball can be either pushed or hit.

### **Push In :**

- (1) A player from the team opposing the team of the player who is responsible for sending the ball out, will be given a chance to put the ball again in play with a 'push in', at the place from when the ball goes it.
- (2) At the time of 'push In', the players of the opposite team should be at least 5 metres away from the player who is executing the push in.

### **Bully**

The game is started again with a 'Bully' under the following circumstances :

- (1) If, by chance, during play the ball is caught in the goal-keeper's pad or any other's players or the referee's clothes.
- (2) When players of both the teams commit a foul at the same time.
- (3) When during play the ball is torn open and it becomes necessary to take a new ball.
- (4) When the game has to be stopped because of a serious injury caused to a player during play.

Under the above circumstances, the game is started again with a Bully, from a spot decided upon by the referee. The spot should be 14.63 metres away from the back-line. In this action one player from each side stands facing the other in such a way that his right shoulder is turned towards the goal/back line of his side with legs placed apart at shoulder width distance. The ball is placed on the ground between these two players and the action of 'Bully' is executed when the referee gives a signal.

**Misbehavior :** If during play, the player is found to act in an unsportsman like manner, is playing violently, does not obey the decision of the referee or uses abusive language, the referee punishes him in the following ways, depending on the seriousness of his misbehaviour.

(1) If the player is misbehaving for the first time and if his offence is not serious, the referee calls and cautions him.

(2) Even after being thus cautioned, there is no improvement in the player's behaviour, the referee warns by showing him the Green card.

(3) If a player's misbehavior is of a serious nature, the referee shows him a yellow card and asks him to leave the ground for some definite period.

The power of deciding the seriousness of the misbehavior, rests with the referee. A player who has been sent out of the ground as punishment cannot be replaced by a substitute.

A player who has been sent out of the ground by the referee by showing him yellow card can return to the ground with the permission of the referee after completing the period of this punishment.

**In case of Tie :**

If after the completion of both the halves of the match, no goal has been scored by either team or when both the teams score an equal number of points, it is said that there is a tie in the game for deciding the winner. Under these circumstances even after the 'tie breaker' rule is applied, the tie is not resolute and the winner cannot be decided, each player of both the teams is given alternately five penalty strokes, under the 'Sudden Death' rule whichever team succeeds in scoring a goal first will be declared the winner and the game brought to an end.

**Penalty corner :**

The attacking team is awarded a penalty corner to be executed from a spot at a distance of 9 to 10 meters from the goal post behind the shooting circle area of the defending team under the following circumstance.

(1) If a foul is committed by a player of the defending team intentionally in the area between the back line of his side and the 20.90 m Line.

(2) When a defending player commits a foul in the 'shooting circle' area.

(3) If a player from the defending team hits the ball and intentionally sends the ball beyond the back-line.

If a foul is committed under the circumstances mentioned above a penalty corner is awarded as described below.

(1) The penalty corner is executed by placing the ball on the back-line, 9 to 10 m away from the goal post.

(2) While executing penalty corner, the ball can be hit or pushed.

(3) While the penalty corner is being executed, the player executing the penalty corner stands with one of his legs behind the back-line and all the other players of the attacking side stand outside the 'shooting circle'.

(4) While the 'penalty corner' is being executed the goal-keeper of the defending side and 4 other players of his team, i.e. five defenders in all stand behind the goal-line or back-line, at a distance of 4.55 m from the players executing the penalty corner while the other players stand in the ground in the front part of the central line.

(5) When the ball hit or pushed by the player executing the penalty corner goes out of the the shooting circle, the attacking player stops it and tries to hit it into the goal, after bringing it into the circle while the defending players try to stop the ball.



(6) Until the action of executing the penalty corner begins, players of neither party can enter the prohibited area.

(7) The player who executes the penalty corner cannot play the ball again until after another player has played it.

(8) During the execution of the penalty corner, if the defending team breaks a rule, the attacker is awarded another chance to take the penalty corner. However, if an attacker breaks a rule, the defending party will be awarded a free Hit from outside the shooting circle.

#### **Penalty stroke :**

When the attacking team is about to hit the ball from the shooting circle with a view to scoring a goal, if a player from the defending team breaks a rule and if the attackers are unable to score a goal, and if the referee feels that the attackers would certainly have scored a goal, under such circumstances the attacking team is awarded a chance to take a 'penalty stroke'. Also during the action of executing a 'penalty corner', if the defending team commits a foul intentionally and repeatedly, the attacking team is awarded a chance to take a 'penalty corner'.

At the time of the execution of a penalty corner, the goal-keeper stands steadily on his goal-line. The rest of his team-mates stand behind the 22.90 m long line on the side of the 'centre line', while one of the members of the attacking team stands near the penalty stroke point, for executing the 'penalty stroke'. His other team-mates also stand behind the nearby 22.90 m line in the direction of the centre line.

The player executing the 'penalty stroke' moves one step forward (only once) and tries to send the ball into the goal with a push, flick or a scoop. He cannot 'hit' the ball.

If the ball crosses the goal-line and enters the goal, the attacking team is awarded a goal. But if the goalkeeper steps the ball, play is resumed by giving a free hit to the defending team to be executed from outside the shooting circle, when a 'penalty stroke' is announced, the watch showing the time of play is stopped and is started again when the action of executing the penalty stroke begins.

#### **Referees :**

There are two referees and one table official in a game of Hockey. From two referees, each of whom gives decisions about his half of the ground. The judges record the timings of the game by agreement and in-co-ordination with each other. They also keep a record of the goals scored and of substitutions. Each of them also maintains a record of the cautions, warnings and dismissals in his own half of the ground.

### **EXERCISE**

#### **1. Answer the following questions in detail :**

- (1) State the steps of teaching the skill of Dribbling.
- (2) Give the detail information of 'Penalty Corner'
- (3) When can a goal be considered to have been scored ? How is a game started again after a goal has been scored ?
- (4) State the types of Tackling, and give detail of one of them.



**2. Answer each of the following questions in one or two sentences :**

- (1) What is the length and width of the hockey ground ?
- (2) When does a free hit given in hockey game ?
- (3) When is Bully given in Hockey game ?
- (4) How many referees are there ?

**3. Select a suitable-correct option from options given below the questions :**

- (1) After taking 'penalty stroke, if it is unsuccessful from where game is started ?  
(A) From the middle part of the ground                      (B) From the shooting circle  
(C) Again from the penalty stroke point                      (D) From Side Line)
- (2) What will be the radius from Goal Posts for marking 'shooting circle' ?  
(A) 14.75 metres                      (B) 14.90 metres  
(C) 15.00 metres                      (D) 14.63 metres
- (3) When during a hockey match, players of both the teams commit a foul at the same time how does the game start again ?  
(A) By corner Hit                      (B) By Bully  
(C) By penalty corner                      (D) By free hit taken from middle part of the ground

**Activity**

- Draw a Hockey Ground on the play ground

●

**Invention and development of Table-Tennis game :**

The game of Table Tennis was invented in 1880 in England. When this game has invented its name was "Gasima." Some years after the invention the name "Ping pong" was given to this game. The name of the inventor of this game was "Jems Gib' The association of Ping Pong game was established in 1902, in England for the first time. The same year its competition was held. The final name of Ping Pong game was considered as "Table Tennis in 1921. The newly named association was established in 1926. Table Tennis Association" as "England Table Tennies Association".

For the establishment of "World Table Tennis Federation", Dr. Olay Lahman of Germany had convened a meeting in 1926 in Berlin, in which Germany, Australia, England, Hungary, Czechoslovakia and Sweden countries had taken part. The first president of this newly established "World Table-Tennis federation" was Ewar Monteue. The first world Table Tennis competition of this first federation was also organised in 1926. Upto 1935 the countries taking part in Two yearly Table Tennis championship were all European countries.

America, England and India had started taking part in world championships in 1935, 1937 and 1939 respectively. Outside the European countries, the world Table Tennis championship was organised in the city of Keiro of Egypt country for the first time in 1939. Because of II world war, these competitions were not organised from 1939 to 1945.

In 1937 "All India Table Tennis Federation was established in India under auspicious of this Federation" National Table Tennis championship was organised in Kolkata in 1938, for the first time. After that, regularly the National competitions are being organised in India regularly..

In 1952 and 1975, under the auspices of All India Table Tennis Federation the 'World Table Tennis championships were organised in Mumbai and Kolkata respectively.

**Play ground:**

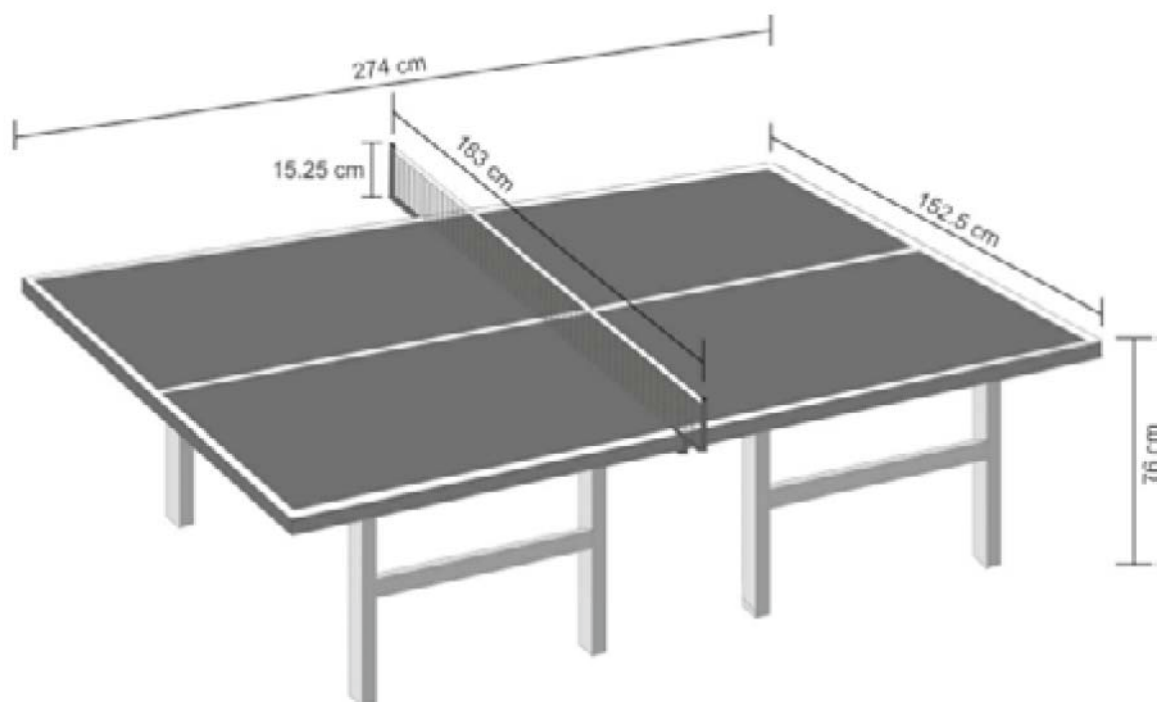
Mostly the game of Table-Tennis is being played in a closed big room or in a hall, Keeping a table. The length of the table is 274 cm, the breadth 152.5 cm and the height is 76 cm.

Since, the weight of the ball of Table Tennis is 2.40 gm to 2.54 gm, the possibility of the ball being deflected with a slight wind is there, hence the windows and the door of a room or a hall are kept closed. Presently this game is being played in an air-conditioned room or a hall. So that, at least one table can be put in a room and a player can have free movement around the table, the minimum length of a room, should be 25 feet and the height 15 feet. The ceiling of a room or hall from the floor should be 12 to 15 ft. minimum.

**Equipment :**

The equipments of the game of Table Tennis, are : (1) Table (2) Net with its supporting posts (3) ball and (4) Racket (Racquet)

**(1) Table :** The table is rectangular. The figure of the table shown is as under; As shown in the figure, the length is 274 cm (2.74 mts), the breadth is 152.5 cm (1.525 mts) and the height from the floor upto upper surface of the table is 76 cm. The upper surface of the table can be made from any substance, but should be such that, when a standard ball is dropped from the 30 cm height on the upper surface of the table, it should rebound upward from 22 cm to 24 cm.

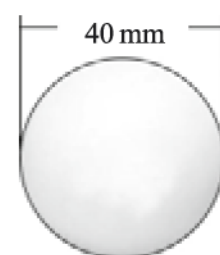


The colour of the upper surface should be dark especially green. The edge of the upper surface around the table should be 2 cm wide and it should be coloured with white colour. The 152.5 cm long lines are called end lines and the 274 cm long lines are called side lines

For the game of doubles, the upper surface of the table is divided in two equal halves by 1/4 cm wide central line, which also should be white in colour. It is called middle line. It is parallel to the side lines.

**(2) Net with supporting posts :** Net is tied in the centre of the table, which divides the table in two equal halves from the above surface of the table. The net shall remain parallel to the end lines. The length of the net shall be 183 cm and its width shall be 15.25 cm. It is tied with the supporting posts with the strings. The heights of the supporting posts also shall be 15.25 cm. The outer edges of the supporting posts shall be 15.25 cm away from the side lines. In the figure of the table the net is shown tied in the centre of the table.

**(3) Ball :** The ball should be completely round. It's diameter should be 40 mm. It's colour should be white or orange and unreflected. It's minimum weight should be 2.67 gm and maximum 2.77 gm.



**(4) Racket :** The surface of a racket should be dark and unreflected. The blade of the racket should be that of wood, having uniform thickness, flat and hard. To make both the sides of the blade uniform, the granular rubber can be fixed. Total thickness of the blade should not be more than 2 mm, or if the layer like a sponge is fixed below the rubber the total thickness along with the rubber should not be more than 4 mm. If on one side the rubber is fixed and on the other side the blade of wood is kept open, its colour should be natural like wood. It should not be cloured.

#### **Skills of Table - Tennis Game :**

We shall get information regarding the following skills :

- (1) Grip of Racket
- (2) Service :
  - (i) Fore hand service (ii) Back hand service (iii) Spin service
- (3) Attack (offence) :
  - (i) Fore hand shot (ii) Back hand shot
- (4) Defence :
  - (i) Fore hand return (ii) Back hand shot

**(1) Grip of Racket :** There are two types of Grip: (i) Shake hand grip (ii) Pen grip

**(i) Shake hand grip :** As we grip the hand of a person in the action of shaking the hands, here we have to grip the handle of the racket instead of the hand of a person. In this grip all the four fingers shall remain on one side of the handle and the thumb shall remain on the other side. The flat portion of the blade of a racket shall remain sideward and the rim of the blade shall remain upward.

**(ii) Pen grip :** In this grip we have to hold the racket, in the manner we hold the pen. In this grip the thumb and the first finger are adjusted on the handle in such a way that the flat portion of the racket remains upward.

**(2) Service :** There are three types of service : (i) Fore hand service (ii) Back hand service (iii) spin service.

**(i) Fore hand service :** While doing the service, a player keeps a ball in one hand and the racket in the other hand. If a player is right handed, he shall hold the racket in right hand and the ball in the left hand. In fore hand service, after tossing the ball, a player shall hit the ball with right hand in such a way that the palm of the right hand shall remain toward the player in front. The ball will be hit with the contact of the ball on the flat part toward the thumb side. The ball hit in such a manner shall cross the net and fall on the half portion of the table.

**(ii) Back hand service :** In the back hand service, after tossing the ball, the player shall hit the ball with right hand in such a way that the portion of the fingers on the back side of the palm shall remain toward the player in front. In this type of action, the ball will be hit with the flat portion of the racket opposite to the flat portion of the racket in the fore hand service hit.



**(iii) Spin service :** In the spin service, the ball after falling on the table shall fall on the half portion the table of an opponent player, turning in round position. The ball hit in this manner is so effective that it becomes difficult for the opponent player to play. In spin service there are three types. (a) Top spin service (b) back spin service and (c) side spin service.

**(a) Top spin service :** In the top spin service, while touching the ball with the racket, it (racket) is kept leaned forward at an angle of  $30^{\circ}$ . In this action, the racket touches the upper portion of the ball and pushes the ball on the front side, with the speedy action of the wrist, in the round motion. In this action, the hand catching the racket remains little bent in the beginning. This hand becomes straight after hitting the ball. In top spin service the player is always in the attacking position and he is very quick.

**(b) Back spin service :** In the back spin service, while touching the ball with the racket, it (racket) is kept leaned backward at an angle of  $30^{\circ}$ . In this action, the racket touches the lower portion of the ball. In this action the racket is moved on the back side with a jerk. The ball hit in this action, is tossed little higher than the top spin, but the ball instead of falling far on the table, it falls near the net. The opposite player can not imagine the motion of the falling ball, hence, the player may get failure in hitting the ball.

The position of the hand and the wrist in this spin is the same as in top spin. The back spin action is called as "chop" also.

**(c) Side spin service :** After getting mastery in the top spin and the back spin, it becomes easy to learn the side spin service, because the action of side spin is like the mixture of top spin and back spin. In side spin service, a player does not touch the ball from the front side, but touches from the side. The ball spun in this manner, goes outside the table with speed.

**(3) Attack (offence) :** There are two types of offence : (i) Fore hand shot and (ii) Back hand shot.

**(i) Fore hand short :** Here, the word shot has been used in the meaning of offence. The action of this skill is like an attack. Thus in the action of this skill, keeping in view the position of the coming ball, left leg and end the left hand are taken toward the net in such a way that the shoulders of a player make an angle of  $90^{\circ}$  with the net. Before doing this action, the hand shall remain bent from an elbow at an angle of about  $135^{\circ}$ . While performing this action of offence, in the beginning the hand is kept on the back side at the distance, 30 cm at the height of waist. After touching the ball, the hand is raised up to the height of shoulder. Since, the ball coming with speed is to be hit, the racket is kept at right angle and the action of hand is done freely. The palm of a hand shall remain facing the net in this action.

**(ii) Back hand shot :** Here also the word shot is used in the meaning offence. In this action, the hand is to be kept in the opposite direction of that of the fore hand shot. In this action, the palms of a hand shall remain in the opposite direction of the net. In this action also the touching with the ball is to be done at the maximum height of the ball like fore hand shot. While performing this action the right leg and the right hand come in such a position that the shoulders of a player shall remain at an angle of  $90^{\circ}$ . Here, a player has to take his position keeping his body little far from the ball, because the hand is to be taken on the left side from the front of the chest. This position makes the hitting action easy. In this action, the ball falls, on the opposite side of the table and goes away before the opponent player gets ready to play the ball.

**(4) Defence :** There are two types of defence (i) Fore hand return and (ii) Back hand return.

**(i) Fore hand return :** Here the return word is used in the meaning of defence. To make the speed of attack of the opponent player restricted the defensive game is being played. For the action of defence, the ball should be allowed to go little far. In this action, one has to stand at a distance from where he has to contact the ball. The position of standing at particular distance depends upon the attack of an opponent. For doing this action, one has to put his right leg on the right side in the direction of the coming ball.

**(ii) Back hand return :** Here also the return word is used in the meaning of defence. This action is to be done when the coming ball goes on the left side. In this action one has to put his left leg on the left side in the direction of the coming ball. The right hand is taken on the lower side from the front of the chest, and the body is to be leaned a little in front in the left side. In this action the ball is hit with a back spin push. This action is little difficult than fore hand defence. One has to keep the balance of the body while performing this skill. A player should play in ball with back hand defence only when the opposite player plays the ball either with fore hand defence or with back hand defence, when it comes to the left side.

#### **Rules of Table-Tennis game :**

##### **(1) Some Definitions :**

(i) Rally : The time during which the ball remains in play is called "Rally".

(ii) Let : The situation in which the points are not given is called "Let". e.g. when the served ball, after touching the upper edge of the net falls on the opposite table, it is called "Let". In this situation of Let the service of a player shall continue. He neither gets a point nor loses the point.

(iii) Point : Except the situation of let, the situation in which a player opposite to the player who makes the foul shall be given a point.

In the rally, a player who hits the ball first is called "Service doer" and who hits the ball latter on is called 'service receiver". In the single's game there are only two players, the service doer and the service receiver.

In double's game there are four players. The player who does the service is first player. The opposite player in cross, at the opposite side is the second player. On the left side of the server is the third player and opposite to the third player in cross is the fourth player.

**(2) Correct service :** The ball put in the free hand when becomes steady, a player can toss it in the upward direction under the watch of an umpire. When the tossed ball comes downward, a player shall hit it. When a ball hit in this manner, touches the table of server and crossing the net when falls on the table of the receiver, it is called "correct service".

In the game of double's, when the served ball falls on the right side half table of the opposite side, is received by the receiver, who in turn hits the ball and returns to the server is called the correct service. Before serving, the ball is to be kept in the free hand. The free hand fingers shall remain closed and the thumb shall remain free, and the palm will remain open. While tossing the ball the free hand should be above the surface of the table.

**(3) Ball in Play :** From the moment the ball is tossed, the ball will be considered in play except the situations given below.

- (i) The ball touches one side table twice.
- (ii) Except in service, the ball hit falls on one's table or touches it.
- (iii) A player hits the ball continuously for more than once.
- (iv) The ball touches any part of the body except the weight of the hand in which the racket is held, or the ball touches any part of the clothing.
- (v) The ball touches any thing except the net and its supports.
- (vi) The served ball in double's game, touches the left side table of the server or the receiver.
- (vii) In double's game, a player touches the ball out of this turn.

**(4) To send back the ball correctly :** A service ball, or a ball in play should be hit in such a way that it may fall on the table of the opponent player from over the net or from the side. In doing so, if the ball touches the net or the supports of the net and falls on the table of an opponent player, it shall be considered being sent back correctly.

**(5) Let :**

The rally shall be called Let in following situations.

- (i) When the served ball, in the action of passing from over the net, touches the net or its supporters. This time the service should be correct otherwise.
- (ii) The service is done when the receiver or his partner is not ready.
- (iii) In the out of control incidents when a player can not do the service correctly or return the ball.
- (iv) When mediation is done because of the mistake of play turn.

**(6) Point :** In the following situations a player shall lose the point :

- (i) When correct service is not done.
- (ii) When correctly played ball can not be sent back.
- (iii) When the ball is in play, a player touches the net or its support with his racket or the cloths put on by him.
- (iv) When the ball is in play, the free hand touches the upper surface of the table
- (v) When the ball is not in the play but the ball sent by a player otherwise, touches the player or the things put on by him, without touching the table on this side.
- (vi) In doubles game, when a player hits the ball out of his turn.

**(7) Game :** In single's game or double's game, whosoever scores 11 points first shall win the game. If they score 10 points, the single player or a pair of players when shall score the points, with a difference of two points, shall win the game.



**(8) Competition :** The competition shall be of seven games. The player or a pair of players whosoever wins four games out of seven games shall win the competition. The games shall have to be played continuously.

**(9) Selection of a side or a service :** Selection of any side of a table or doing the service is done with the tossing of a coin. If a winner in tossing selects the service, the loser will have an automatic choice of side. The winner of tossing the coin if wishes, can tell the loser to choose any of the two.

In the game of doubles, if a pair of players gets the choice doing first two services, they shall decide themselves as to which player of the pair shall do the first service. Likewise the opposite pair shall decide as to which player of the pair shall receive the first service. In the following games also such turns of doing services or receiving services shall continue.

**(10) Change of side or service :** A player or a pair of players who might have started the game with a particular side, shall start the next game from the other side. Likewise, till the end of the competition the sides shall have to be changed. In the last decisive game, whichever player or a pair of players shall score first 6 points, they shall have to change the sides.

In the double's game, first two services shall be done by the selected players. Likewise the receiving of the services shall be done by a selected players. The following two services shall be done by the receivers. Thus, doing of services and receiving the services shall continue till the end of the game.

When both the sides shall score equal 10 points, the turn of service shall remain the same but the players shall do one one services by turn. This shall continue till the end of the game of singles.

In the decisive game of doubles whichever pair scores first 10 points, they shall have to change the turn of service. The receiving pair shall change the turn of receiving the service. In the competition of double's game, the turn of receiving the service shall be changed in the next game. The player or a pair of players, whoever does first service shall receive the first in the following game.

**(11) Foul in changing the side doing the service and in receiving the service :** In the turn of changing of the side if it is not done so and whenever the foul comes to the notice, the side shall have to change immediately. Because of not finding the foul of changing the side, if the game is over, the foul shall not be taken into consideration. Before finding the foul, whatever points might have scored, shall be taken into consideration.

If any player, does the service by mistake out of turn or receives, the ball out of turn, such mistake shall be stopped and the same turn which was in the beginning shall be arranged or after the score of 10 points, what ever might be the turn, that shall be decided. The points scored at the time of finding the foul shall be taken into consideration.

## EXERCISE

### 1. Answer the following questions in detail :

- (1) Write the types of the grip of a racket and explain them.
- (2) Explain the fore hand service and back hand service.
- (3) Mention the types of spin service and explain them.



- (4) Explain the fore hand attack (offence)
- (5) Explain the back hand defence.

**2. Answer the following questions in short:**

- (1) Write the measurements of the table of Table Tennis game and explain.
- (2) Write the measurements of the net and a ball of Table Tennis game and explain.
- (3) Explain the making of Table tennis racket.
- (4) What is "Rally" in Table tennis ? Explain.
- (5) What is "correct service" in table tennis ? Explain.

**3. Write answers to the following questions by selecting correct option from the options given below :**

- (1) In which country the game of table tennis was found out ?  
 (A) France                      (B) England                      (C) Germany                      (D) Japan
- (2) From the beginning of the invention of the table tennis game till the present there were some names. One of the following is wrong. Find out  
 (A) Gasima                      (B) Asima                      (C) Ping Pong                      (D) Table Tennis
- (3) What is the length and the breadth of the table of table tennis game ?  
 (A) 264 cm - 142.5 cm                      (B) 290 cm - 163 cm  
 (C) 274 cm - 152.5 cm                      (D) 280 cm - 155 cm
- (4) What is the measurement between the upper surface of the table and the ground floor in table tennis game ?  
 (A) 56 cm                      (B) 66 cm                      (C) 76 cm                      (D) 86 cm
- (5) What is the diameter of table tennis ball ?  
 (A) 36.2 mm                      (B) 37.2 mm                      (C) 38.2 mm                      (D) 40.0 mm
- (6) What is it called, in which the ball remains in the play for some time ?  
 (A) Rally                      (B) Net                      (C) Bat                      (D) decided time
- (7) During the Rally, point is not given. What is it called ?  
 (A) Wrong point                      (B) Correct point                      (C) Let                      (D) Rally
- (8) What a player is called who hits the ball during the Rally ?  
 (A) Receiver of service                      (B) Sending the ball back  
 (C) Server                      (D) Player of a ball

- (9) How many players can play in table tennis double's game ?  
(A) Two (B) Four (C) Six (D) Eight
- (10) What does winner of tossing the coin select ?  
(A) Side or service (B) Ball (C) Racket (D) Umpire
- (11) At what score of the points a player or a pair of players have to change the side ?  
(A) 5 points (B) 10 points (C) 7 points (D) 12 points
- (12) What will a server be after 5 points in singles game ?  
(A) Hitter (B) Receiver (C) Player (D) Looser
- (13) In which year was the game of table tennis invented ?  
(A) 1871 (B) 1880 (C) 1891 (D) 1901
- (14) In which year was the "All India Federation of Table tennis established ?  
(A) 1927 (B) 1937 (C) 1947 (D) 1951
-

### Wrestling

Wrestling is a Farsi word which is known as "Batthambattha". It is played worldwide, in one or the other forms according to the cultures and skills of the region. It is recognized with different names in different parts of the world. For example: In Japan it is known as SUMO, in Russia - SAMBO, in Turkey-CHALGI, in Iran-Kushti, in India - Malyuddha.

In ancient Indian culture, Malyuddha was famous and during the times of Mahabharata, Shree Krishna, Balram, Bheem, Kans, Chanur, etc were the famous skilled players known. But in the present times it is played in two styles: Freestyle & Graeco-Roman which are widely accepted and famous. Wrestling is also included in Olympic Games. Wrestling was included in Olympics since 1896 rather; the importance of Wrestling took a tool after the World War II. Now, almost every country entertains the event internationally.

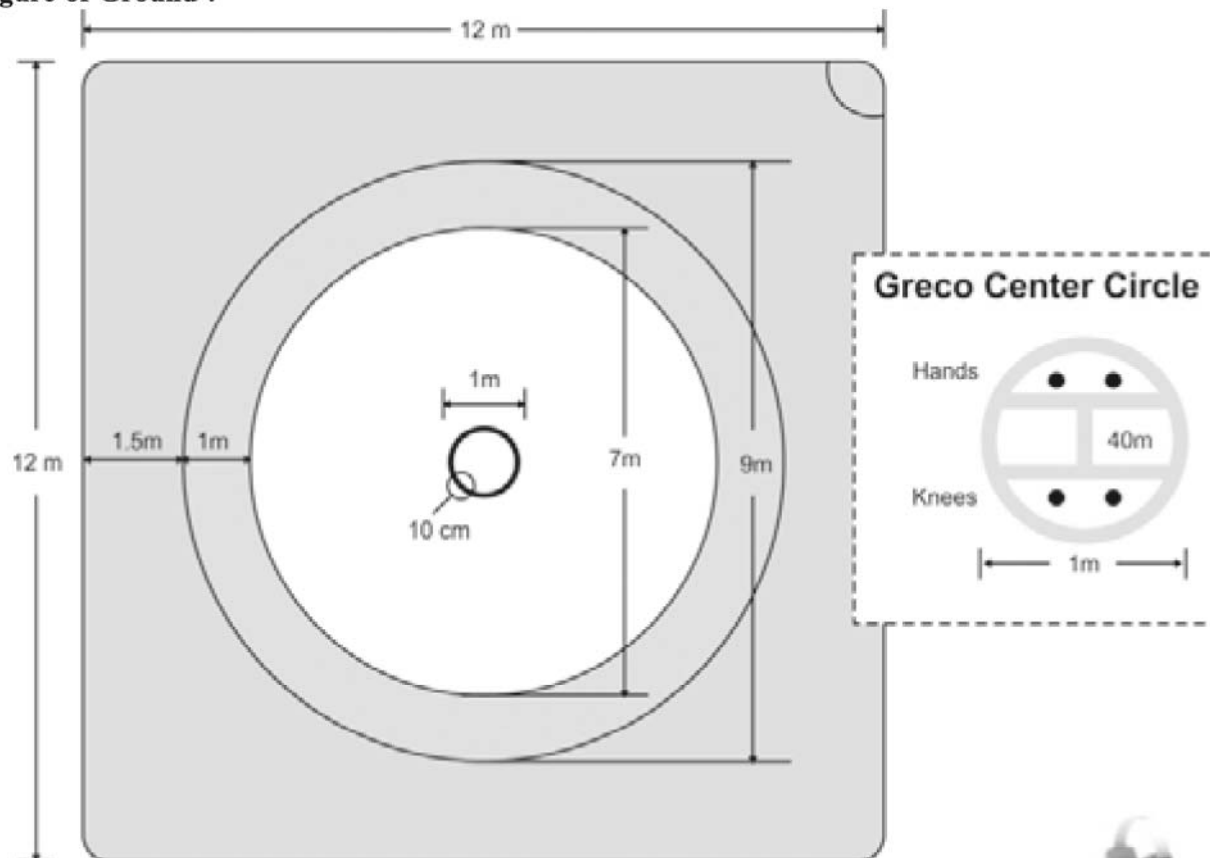
Freestyle of wrestling is very famous and has lot of viewership than the Graeco-Roman style. In that all styles of grip, throw and pinning the opponent is allowed, but duels are controlled by the International Rules of Wrestling. Graeco-Roman wrestling has the same rules as Freestyle, but the main difference is that you cannot hold the opponent below the hips or pin them with your legs. In both, pulling or snatching of the hair, muscles or the covert organs of the opponents, kicking the hands, legs or fingers; strangulating the neck are considered to be violating the rules.

### Rules :

- (1) In one weight category, only one player of any team can participate.
- (2) One the day of the competition, the competitor should be clean shaven or must have been growing it for a long time.
- (3) In the game of wrestling, there are 3 rounds of 2 minutes each. In between two rounds, there is a rest period of 1 minute. If the player wins before the time, the game will be over.
- (4) To win the game, you have to pin down the opponent with his/her shoulders on the mat and the hold is kept for 1 second to win the game.
- (5) If you wish to use ear protectors, you need to take prior permission from the authorities. It cannot be made of metal.
- (6) Players cannot wear dress with maps of countries logos or other emblems.
- (7) You should not wear wrist bands, unless permitted by doctor or in case of any injury.
- (8) The body cannot be smeared with oil or grease.
- (9) You should not step into the mat frequently during the competition.
- (10) Players should not wear rings, bracelets or any other things that injures the opponents.
- (11) While Weighing the players, the referee should investigate in accordance to the requirements of the game, and then the referee has to warn the player and not allow them to participate.
- (12) If the player is insufficiently dressed player should be given 1 minute time. In this given time, if the requirements are not fulfilled, the player is considered to lose the game.

- (13) A junior player is allowed to participate in the senior category after getting Doctor's certificate and permission from guardians.
- (14) To take part in any international competition, the male or female player must have been granted permission from the International organization.

**Figure of Ground :**



### Uniform

According to the international rules, competition-uniform is a singlet one-piece singlet. In this singlet, one is red and one is blue. Bandage or sports belt should be worn by doctor's advice. Light kneecap is permitted. Shoes should be light weight and without heels. The body should not be smeared with oil or grease. Nails should be cut and trimmed.

### Time

**Sub-junior section :** There are 2 rounds of 2 minutes each in sub-junior wrestling. There is a break of 30 seconds in between the rounds.

**Junior & Senior :** There are 2 rounds of 3 minutes each. There is a break of 1 minute in between the rounds. But, if any player wins before the time, the game will be over. The time-keeper announces the time every minute. When the time ends, the time-keeper will ring the bell and then the referee will blow the whistle and signals the end of the game.

### Officials :

In this game there are four officials-one referee, one chairman, one judge and time-keeper



**AGE Category :**

In accordance to the age of the players, the following categories are given :

- |                         |   |                    |
|-------------------------|---|--------------------|
| (1) For school students | : | 14 -15 years       |
| (2) For sub-junior      | : | 16 -17 years       |
| (3) For junior          | : | 18 -20 years       |
| (4) For senior          | : | More than 20 years |

**Weight Category :**

There is weight category similar to age category for school students, sub-junior, junior and senior players. For example, looking at a standard 11 student, the weight categories have been mentioned below :

School Children Weight (in kgs)	Sub-Junior Weight (in kgs)	Junior Weight (in kgs)
29 -32	39 -42	46 -50
35	46	55
38	50	60
42	54	66
47	58	74
53	63	84
59	69	96
66	76	96 to 120
73	85	-
85	-	-

**Skills**

**(1) Stance :** The game begins with salutation. They come in the middle of the ground and the wrestlers shake hands. The referee checks their nails and other requirements. Then the wrestlers move towards their respective corners. They face each other from their corners and after hearing the referee's whistle, they move quickly and with agility to start the game.

**(2) Push :** Immediately after the act of salutation is over, the wrestlers will start wrestling. In order to win over the opponent, they push and pull one another - which has two types.

**(i) Dandki Push :** In this action, both the players are in the right foot forward stance. One of the players would put pressure on the dand of opponent and push him back. The opponent would put his front leg behind and go back, and upon getting the take after two or three backwards move, would put pressure on the dand of the opponent and push him back.

**(ii) Neck Push :** Both the wrestlers will grapple behind each other's neck, and the one who tries to push the opponent will move his front leg back and pull the opponent forward towards him. He will move three steps back. The opponent also does the same.

**(3) Standing Dunki :** When the wrestler is standing on the right leg pavitraa, then he puts his left hand on his chest and keeps the left elbow in line with the shoulders. The right hand puts on his right side and pushing his right leg on the ground and taking full turn towards his right side and falls opposite left side. The full turn of the body in the air is called 'Khadi Dunki'. Before taking part in competition a player takes 15 to 20 Khadi - Dunki for warning up.

**(4) Sitting Dunki :** Similar to the above dunki, when the werestler puts his right leg in front in the sitting position and performs the above steps is called sitting dunki.

**(5) Bagli :** Standing in front of each other, taking stance and immediately taking the opponent's left hand's wrist with his left hand and pulling him towards us, turn left hand side and opponent's right shoulder inside your right armpit, and with right hand opponent's elbow's upper arm and pull him to the left hand side and push him down. The opponent is pinned on the ground in supine position. In this time, he quickly sits on the opponent and pins him down.

**(6) Bagli ki Rokh :** When the opponent holds your right shoulder, and pins you under his armpit and tries to use the Bagli skill, then we move our left leg to the opponent's left thigh from outside his body and hold him, which stops him from using the Bagli skill on him.



**(7) Standing Tang :** When the opponent holds him from behind with both arms around the waist then he breaks the hold by holding his right wrist and moving his hand from under his left shoulder, clasping him tight, he pull him towards the right side while locking our left leg behind his left leg at the knee. These both actions are done swiftly in one single fluid motion, the opponent will fall on his thorex on ground in supine position. His left hand is entwined around his neck and he is pinning the opponent on his left side.

**(8) Sitting Tang :** When he is in the sitting stance and the opponent is holding him from behind at the waist, then he performs a step similar to Standing Tang and pins the opponent to win the game.

**(9) Hand Ka Gal Khoda :** When the opponent is standing in front of him and his left arm is holding his neck from the left side and his head is pinned in the armpit and the entwined hand would be stretched to the opponent's right shoulder and then his right hand is under his right armpit and on his right side waist and hold him tight.



### EXERCISE

**1. Do as directed :**

- (1) What is push in wrestling ? Give details of this skill.
- (2) Draw the diagram of the wrestling ground.

**2. Write short notes :**

- (1) Standing stance (2) Bagli (3) Hand ka Gal Khoda (4) Bagli ki Rokh

**3. Give the answers in one or two sentences**

- (1) What is the Indian name of wrestling ?
- (2) What is the age group for school player ?
- (3) What are the wrestling styles famous in the modern age ?
- (4) What is height of the ground in wrestling ?
- (5) What is stance (salutation) in wrestling ?

**4. Find the right answer from the following:**

- (1) The age group of junior players in wrestling is :  
 (A) More than 10 years (B) 16 to 17 years  
 (C) 18-20 years (D) 14-15 years
- (2) How many rounds are played in wrestling ?  
 (A) One (B) Two (C) Three (D) Four
- (3) How many officials are there in wrestling ?  
 (A) One (B) Two (C) Three (D) Four



Since ancient times the weaponless fighting art are popular. Wrestling was one of the arts among all art which became popular since Ramayana & Mahabharat times. Another art originated in the end of 19<sup>th</sup> Century is Judo. It is believed that Japan is origin source of Judo. Japan has developed this game/art.

The Buddhist monks' monastery had lots of wealth in Japan. And there was a fear of that wealth being stolen by thieves/robbers. To get rid of this fear the Buddhist monks discovered this art so that they could defense against the thieves also and their principle of "Non violence the best religion" was also maintained. This art was "Judo". Thus to face the thieves without weapons and to protect their wealth and for self protection, Buddhist monk mastered in Judo game/art. Through this weaponless art they just gave physical pain to the robebrs/thieves and chased them away. Thus with the passage of time it became the game for self defence. Judo became regularized and competitive.

The fight fought without weapons was called YAWARA OR JU-JITSU, in Japan before 1870

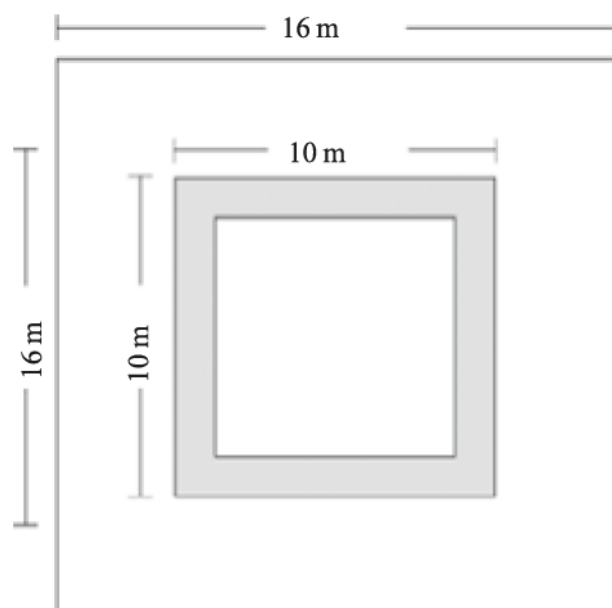
In 1870, Dr. Jigro Kano of Japan learnt, other types of arts fought without weapons and removed the wild elements from it. Then in 1882, this activity began to be taught as Judo in KODOKAN.

In the world Judo 'Ju' means gentle or soft and 'Do' means WAY. Thus this 'Gentle art' or 'civilized way' training was given to the soft and gentle people. In which Buddhist monks were included. 'Judo' means give way, according that he moves out of the way of the opponent and opponent is defeated just by giving some gentle force in the direction of opponent's velocity. By just little force he can be defeated.

Competitions of Judo started in world Olympic Games organized at Tokyo in Japan in 1964.

### Ground

As shown in the below figure Judo ground is 16 meters by 16 meters, but competition ground is of 10 meters by 10 meters. The ground outside the competition area is called the safety area.





## MATS

Judo is played on the mats of 10 metres x 10 metres. The mats are of synthetic material. A whole mat of 10 metres x 10 metres are not available, so the stripes of 2 metres long and 1 metre wide such 50 mats a 10 metres x 10 metres. Squares mat is made. If 16 metres x 16 metres square mat is to be made, then 2 metres x 10 metres strips are required.

This mate should be even and smooth so that easy movement is possible. And there is less possibility of being hurt. These are easily washable also. A big plastic cover is put on this mat. The cover should be red or green. The cover should be not slippery and it should be hard enough.

10 metres x 10 metres or 16 metres x 16 metres mats are arranged in the big hall in such a way that there is no space between them.

## UNIFORM

As Judo involves specific types of skills its dress is also unique. In this Uniform includes

(1) Jacket (2) Trousers (3) Belt

The dress is white or light white color. The dress is made of thick cotton cloth. For girls or women a long sleeveless T-shirt is worn inside the Jacket.

**(1) Jacket :** The jacket is open and long enough to cover the thigh; it is full sleeve and 3 to 5 feet less long than the arm length. The jacket collar should be 4 feet wide and toughly sewed. It has no buttons or buttons holes.

**(2) Trousers :** The trousers are loose. It should be longer than knees and 5 to 8 feet should be open. The knee part has extra thick cloth inside and strongly sewed to prevent the knee injury. The trousers have buttons or button holes.

**(3) Belt :** The belt is used to tightly tie the jacket on the waist part. The belt should be 3 to 5 cm wide and 2.40 metres, to 2.70 metres long. This belt's both ends are kept 15 cm hanging without trying a knot. The level of Judo player can be known from the belt he wears.



Uniform of Judo

The student level is called KYU, while teacher level is called DAN. The teacher level is in descending order and the students' level is in ascending order

#### KYU level in the descending order

Tenth level	–	Yellow
Ninth level	–	Yellow and red strip in middle
Eight level	–	Orange
Seventh level	–	Orange and red strip in middle
Sixth level	–	Green
Fifth level	–	Green and red strip in middle
Fourth level	–	Blue
Third level	–	Blue and red strip in middle
Second level	–	Cream
First level	–	Cream and red strip in middle

In the teacher level, 1 to 5 levels, the belt is black in colour, in 6 to 9 level it has red strip in middle and in 10<sup>th</sup> level the belt is red.

Before knowing the skills one should know, how the contestant in the end break fall on the mat to prevent any injury as a precaution.

#### Types of Break Fall :

There are four types of break fall:

- (1) Side fall (2) Back fall
- (3) Front fall (4) Rolling fall

**(1) Side fall :** In this type of fall, the contestant has to keep his hand straight on the side he wants to make a side fall and other hand is on the stomach. In this situation the straight hand's side is brought in front at shoulder height to get the momentum. And it is given motion to fall down on the mat. That side's leg is raised a bit from top and side falling on the mat is bent and then come in the lying position.

**(2) Back fall :** A back fall is performed when the opponent is pushing the contestant to throw him on the mat, then bending the leg from knees and resting on the knees. To get the reaction from mat both palm are on the mat side and body is allowed to fall on that with back facing the mat.

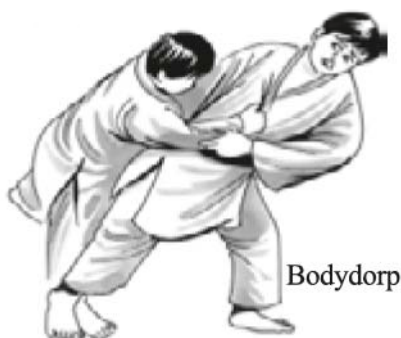
**(3) Front fall :** When the opponent pushes from back side and then fall with chest on the mat side, both the hands are bent from elbows and get the reaction by falling in the ground. The body weight is on both feet and both hands while doing this.

**(4) Rolling fall :** When the opponent is pushing from back then instead of falling directly one takes the support of one hand by bending and the other hand's palm facing outside keeping the hand between two legs roll on the hand and break fall in the supportive hand. While doing this it should be cared that head does not touch on the mat. The body should roll like a ball.

Now we will get the information about concerned skills. Generally these skills techniques are throw type so it is shown as break fall. We will get the information of following skills

- |                                 |                               |
|---------------------------------|-------------------------------|
| (1) Floating Drop : Ukio To Shi | (2) Body Drop : Terio Toshi   |
| (3) Belt Drop : Obio Toshi      | (4) Shoulder Throw : Seoluage |
| (5) Hip Throw : Lift Loin       | (6) Shoulder Drop             |
| (7) Shoulder Wheel              |                               |

**(1) Floating drop :** For this technique one has to stand in natural posture in front of opponent. Directly hold the jacket of the opponent, then for throwing firstly he is held high with both the hands and so that his body is unbalanced on the toes. At time, your left leg should be pulled back a little and at the same time pushed the opponent style side down and push him back with your right hand and the opponent will fall on this back. While falling, to prevent the injury, he will do the break fall on his left hand.



**(2) Body drop :** Stand in front of the opponent on the mat. Directly hold his jacket and then by pulling him, bring him on the toes, immediately take your right leg and put across the opponent's right toe. Then to drop him, push him on the left and right hand side feet firmly. So that the opponent falls on the right side. The opponent while falling will do the left hand's break fall.

**(3) Belt Drop :** Stand in the front of the opponent in the mat. Directly hold his jacket. Then put your left leg near the opponent's right leg. Then turning towards right, keep the right leg parallel to the left leg so that the opponent comes in the position to stand in the right side and on the right direction. In this position keep the left hand straight on his chest and hold the player right side belt from down side with the tight hand's fingers. Then bend a little down from knee, push your left and under the right hand of the opponent when he straightens, lift him high from the belt, catch and then leave him.. Then the opponent will fall on your left hand at an angle on his back fall after lifting to avoid the injury on the back fall hold one opponent on break fall.



**(4) Shoulder Throw :** Stand in the natural posture in front of the opponent and directly hold his jacket. Lift opponent with both the hands, he will rise on this feet. Quickly lift your right leg and keep it ahead of opponent's right leg and let leg in front of his left leg after turning. Hold the opponent right hand with your right hand from below. The from waist pull the opponent down, he will fall down your right shoulder. The opponent is falling break fall with left hand.



Shoulder Throw



Hip Throw

**(5) Hip Throw :** Stand in front of opponent in natural posture directly holding his jacket. Turn on left side and hold opponent wrapping him from back side of wasit keep you both feet in between his both legs in such a way that he comes on your back. Then bend in front from waist, keep your left hand on opponent's right waist. Push him and try to lift him form wasit with your right hand, then quickly pull him in front with your left hand, so that he rises from waist and fall on his back. The opponent should have breakfall with his left hand.

**(6) Shoulder drop :** Stand in natural posture in front of opponent directly holds him from jacket. For this technique hold strongly the opponent from right side's waist belt with your left hand's - from below. Hold the opponent right hand with right hand form below. Then it left hand pulls the opponent downwards and turns the left side. Bend your right leg from knee and pull back your left leg and drop his body on knee. The opponent will fall on mat. The opponent should break fall on left.



Shoulder drop



Shoulder wheel

#### **(7) Shoulder wheel :**

Stand in natural posture in front of opponent holding his jacket directly. For this technique right hand's grip is released bending down from waist, keep the right shoulder on opponent's left waist and lift him with right hand holding him between both the legs and stand up pull the opponent on left side downwards with left hand and push him upwards with right hand opponent will fall from the shoulder like spinning wheel on left side. The opponent should have break fall on left hand.



### **The rules of Judo game :**

**(1) Start of Game :** The contestants stand on the middle of the mat, keeping the distance of 4 metres between them facing each other. They do "Ray" or Namasker to each other and wait for the order of "Hajme" from referee to start the game.

**(2) End of the game :** At the end of the time, the referee says "Sore-made" and the game ends. At the end of the game both the contestants again stand facing each other in the middle of the mat as in the start. Then the referee will give the decision and the result will be declared.

**(3) Walk-over :** When one player is present and the other player is absent, then walk-over ("Fusen-Gachi") is declared. If any contestant withdraws his name from the competition then his opponent is declared the winner (Kiken-Gachi).

**(4) Injury, accident or illness :** When one or both contestants are injured, the referee, stops the game and gives maximum 5 minutes for players' rest or bandaging or rebandaging a wound. If the contestant is hurt or injured and injured seriously and if he is to be sent out of the competition area, then the referee calls it a day and, the referee gives a decision, according to the rules. If the contestant is hurt or ill or meets an accident and he is unable to carry on in the competition, then consulting the other judges, the referee can declare "Kachi-Make" or "Hike-Wake".

#### **Injury :**

- (i) If the contestants is hurt or injured by his own self, he loses the competition.
- (ii) One who is not injured by his own self but causes any harm to any other player, then the player causing the injury is declared the loser.
- (iii) When the harm caused to any player remains hidden, and then the referee may call "Hike-Wake".

#### **Illness :**

If the contestant is ill before or during the match, he/she would be declared disqualified.

**Accident :** When a contestant suffers an injury other than the means of Judo, then the judge and the referee might call a "Hike-Wake".

**(5)** When a situation arises which is not included in the rules and norms then the referee consults the judges and gives a decision.

**(6) Age Group :** For the school competitions, the age group will be as below :

- (i) Under 14 years (Till Grade VIII) (ii) Under 17 years (iii) Under 19 years

**(7) The time period for fight :**

- (i) 3 minutes for boys/girls under 14 years (ii) 4 minutes for boys/girls under 17 years
- (iii) 4 minutes for boys/girls under 19 years

**(8) Method of giving points :**

(i) When a contestant maintaining his balance drops the opponent on mat in such a way that his one shoulder touches the mat then he gets a YUKO.

(ii) When a contestant maintaining his balance drops the opponent and the opponent's shoulder touches the mat the WAZA-ARI point is given

(iii) When a contestant maintaining his balance drops the opponent such a way that his both shoulders touch the mat he gets IPPON means full point and the game is over.

(iv) When the player drops his opponent on mat and presses his back, it is said OSAI-KOMI. The points are given as below till the OSAI-KOMI activity is maintained on the opponent.

**YUKO Point** : For holding the opponent for 10-14 seconds

WAZA-ARI-for holding the opponent for 15-19 seconds

IPPON-for holding the opponent for more than 20 seconds

**(9) Penalty Point** -If the contestant plays a negative game, does not allow for the grip, does not take proper grip, does not try or attempt the turn, waste the time or attempt the illegal unlawful skills, then the penalty steps are taken according to the player's ill-will or mistake.

In the negative game, the referee can give the warning for three fouls. But on the fourth foul he is eliminated from the fight for that particular game.

(10) The contestants participating in one weight group are paired by the draw system. Generally it is knock out competition. A looser is given one chance again.

## **EXERCISE**

**1. Answer the following details :**

- (1) Explain what is included in Judo's dress.
- (2) Give details of KYU and DAN level in Judo.
- (3) Explain how does Judo start and end ?
- (4) Mention the decision given in case of injury, illness and accidents.
- (5) Explain the technique of awarding of the points in Judo.

**2. Answer the following questions in brief :**

- (1) Explain the floating drop technique in the game of Judo.
- (2) Explain the "shoulder throw" technique in Judo art.
- (3) Explain the "Belt Drop" technique in Judo art.
- (4) Explain the "Shoulder wheel" technique in Judo art.
- (5) Explain how the penalty points are awarded.

**3. Choose the correct option as the answer for the following questions :**

- (1) In which country was the Judo game discovered ?  
(A) North Korea      (B) Shouth Korea      (C) China      (D) Japan
- (2) What is the length and width of mat in Judo game ?  
(A) 5 metres x 25 metres      (B) 10 metres x 10 metres  
(C) 12 metres x 12 metres      (D) 16 metres x 16 metres
- (3) What should be the color of the mat in Judo art ?  
(A) Yellow or orange      (B) Red or Green  
(C) Black or white      (D) Green or blue
- (4) How should the Judo mate be ?  
(A) Thick      (B) Thin  
(C) Even and Smooth      (D) Rough
- (5) What is the outer area of Judo game called ?  
(A) Safe area      (B) Unsafe area  
(C) Dangerous area      (D) Comfortable area
- (6) What is the belt series in student level called ?  
(A) KUR      (B) RUK      (C) KYU      (D) KUY
- (7) What is the belt series of teachers' level called ?  
(A) NAD      (B) AND      (C) DAN      (D) DAM
- (8) Find out from below the incorrect skill of Judo  
(A) Floating Drop      (B) Shoulder drop      (C) Body drop      (D) Single drop
- (9) What is the colour of Judo dress ?  
(A) Yellow or light yellow      (B) White or light white  
(C) Cream or light cream      (D) White or Black
- (10) Which word is used to start the Judo game ?  
(A) SORE-MADE      (B) HIKE-WAKE      (C) KACHI-MAKE      (D) HAJME



### History

Buddhist monks introduced this art in India. In the early days, the Buddhist monks used this art to save themselves from the wild animals and thieves in the forests, by overpowering them without harming the opponents in accordance to the non-violence beliefs of Buddhism. As Buddhism gathered prominence in China and Japan, this art travelled with the monks and reached the foreign shores.

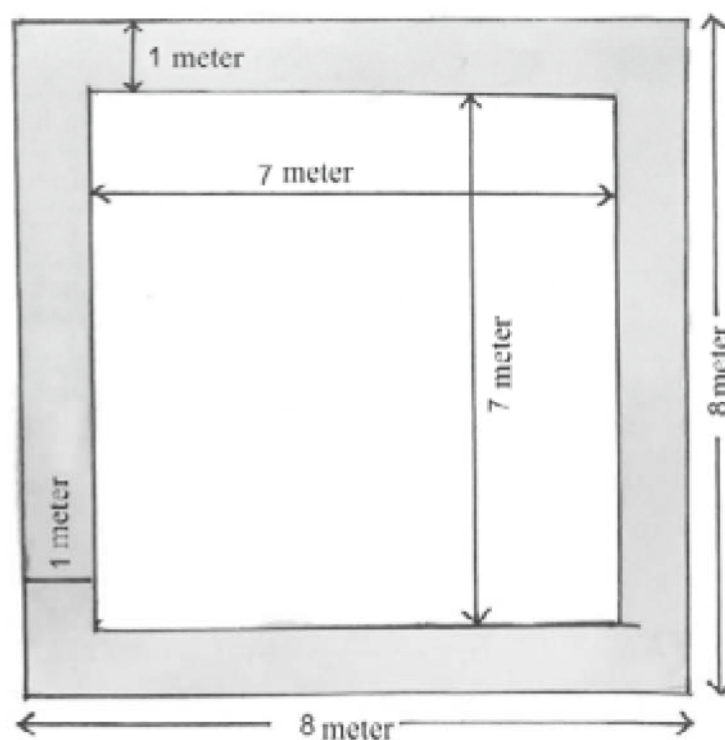
Karate is a Japanese word. "Kara" means empty, "te" means hands. The art of fighting with empty hands (without weapons), is called Karate.

In the 17<sup>th</sup> century, the King had banned the usage of weapons in the Okinawa province of Japan, so that no one could dare fight the King. Under these circumstances, the people of the province started to learn and promote fighting empty handed for self-defence to handle enemies and opponents, which became famous as Karate. From the Okinawa province, it spread all over Japan and then it spread to the whole world. Now people from more than 180 countries are learning Karate.

Gichin Funakoshi is revered as the founder of Karate in Japan. At the end of the 18<sup>th</sup> century, he promoted and popularised Karate. In the beginning of the 19<sup>th</sup> century, this art form was modernised and promoted across the western world by Hansi Gogin Yamaguchi.

In India, this martial art form was first demonstrated in Shanti Niketan. Shinzo Tagaki from the Tokyo province of Japan had come to India at the behest of Shri. Rabindranath Tagore

### Ground





The ground is 8 meters in length and 8 meters in width. This game is played on a square field. It used mats made out of specialised rubber materials. The mat is either Red or Blue in colour. The middle square of 2 metre by 2 metre is red in colour and the outside 1 metre is also in Red colour. This outside 1 meter red area is called the safety zone. Outside the safety zone, the opponent is not given any points. While in play, if any player enters the safety zone, the referee stops the play and calls the players into the middle area and then restarts the play.

### Equipment :

Specialised rubber mats, stop watch, Karate Gi

### Skills:

The main skills of karate are mentioned below :

- (1) Punch - Japanes word Zuki (2) Kick - Japanese word Geri
- (3) Block - Japanese word Uke

#### (1) Punch :

In Japanese, the punch style is called Zuki. There are many methods of punch and some of them are mentioned below :

##### (a) Choku Zuki (Straight Punch) :

In this stance the player keeps his balance on both the legs and with strong hands and at shoulder height, attacks the opponents.

##### (b) JodanZuki (Straight upper Punch) :

In this stance, the player keeps his balance on both the legs and with strong hands, attack the upper part (above the shoulders) of the opponent's body. He should avoid the eyes, nose and mouth of the opponent in this attack.

##### (c) Gedan Zuki (Straigtht Lower Punch) :

In this stance, the player keeps the weight of the body on his legs and with strong hands attack the parts of the opponent's body below the waist.

#### (2) Kick (Geri) :

This is an important stance in karate. The opponent can be attacked in various positions using the legs. Some of them are mentioned below:

##### (a) Hiza Geri (Knee Kick) :

In this stance, the player balances his body weight on his strongest leg and using the edge of the other leg kicks the knees of the opponent

##### (b) Mae Geri :

In this stance, the player balances his body weight on this strongest leg and raising the knee of the other leg to his waist, kicks the opponent.



**(c) Yoko Geri Side Snap Kick :**

In this skill the player puts his body weight on the stronger leg and kicks through other leg. While attacking or kicking the eyes should be on the place or region of the attack, so more attack kicking can be done.



**(3) Hand Blocks :**

In this game, defence is also equally important like attack. Through this the player can protect himself or save himself from any strong attack of opponent. In Japanese language defence is called 'UKE'

**(a) Jodan Uke:**

In this block the hand is bent from elbow and kept a bit above and away from forehead and the attack on the upper part of the body is blocked.



**(b) Chudan Uke Middle area Block :**

In this skill attack on the body's trunk part is blocked or made unsuccessful. In this skill the hand is bent from elbow, hand is fist and kept right in front of nose.



**Rules :**

- (1) The game is of two types (i) Kata (ii) Fight
- (2) In Kata type individual performance is done. This attack is done on the pre assumed imaginative opponent.
- (3) In second type two players attack each other, within norms and rules.
- (4) In this game a special kind of white loose jacket and white loose trouser (karate gi) are worn.
- (5) No gloves can be worn on hands or feet for any defence or attack.
- (6) It is played barefooted.
- (7) In this game there is one mat referee and three side judges.
- (8) Mat referee has to be on the mat when the match is on.
- (9) The player on the left hand side of the referee is called 'Aaeo' and the player on the right hand side called 'Aka'
- (10) During the match no hand attack can be done on eye, nose or any other lower part of waist.
- (11) Each match is of 3 (three) minutes.
- (12) And the match is of 2 (two) minutes for junior boys and girls.
- (13) It is compulsory to follow the safety rules during the match.
- (14) For different attacks different points are awarded. like

Sunbon	-	3 Points
Nihon	-	2 Points
Nippon	-	1 Point

(15) For different errors, different fouls or penalty points are given. Like

- (1) Keikoku - 1 point to opponent
- (2) Haso kuchuee - 2 points to opponent
- (3) Ippon - Knock out from the match

(16) Opponent's hair cannot be pulled.

(17) Opponent cannot be injured by biting with teeth during the game.

(18) One can make any sort of sound or noise for enthusiasm and excitement.

(19) If during match opponent is abused or said bad words then abuser is given 'Keikoku' points.

(20) If during the game, the referee or the judges are abused the 'Haso kuchuee' point is awarded.

(21) When player falls on the ground during the match then he cannot be attacked.

(22) When the match is indecisive in the stipulated time then one extra minute is given.

(23) If the player is not attacking even after the match has started then that player is given penalty point.

(24) In karate martial art, weight categories and age categories are taken care off.

(25) While playing karate, no metallic ornaments or metallic things can be worn on the body.

(26) Today karate is popular Sotokan, Shitoriyu, Gojoriyu, Vadoriyu, like style in India.

(27) During the match, when opponent is outside safety area no attack can be made.

(28) In today's Karate in some styles equipments like head guard, chest guard and chin guard are used as safety devices or safety purpose.

### EXERCISE

#### 1. Answer the followings questions :

- (1) Name and explain the techniques of Punch.
- (2) Name and explain the techniques of Kick.
- (3) Name and explain the techniques of Hand Block

#### 2. Write short notes on :

- (1) Ground of Karate
- (2) Dress for the karate competition.
- (3) Safety devices for karate competition

#### 3. Select the correct option from the given as an answer to the following questions :

- (1) Give the Length and breadth of Karate ground
  - (A) 8 metres x 8 metres      (B) 7 metres x 7 metres
  - (C) 8 metres x 7 metres      (D) 7 metres x 8 metres

- (2) Which of the following is the skill of Punch ?  
(A) Choku-zuki      (B) Hiza Geri      (C) Jodan Uke      (D) Chudan Uke
- (3) Which of the following is the kick attack skill ?  
(A) Jodan Juke      (B) Gedan Juke      (C) Mae Geri      (D) Chudan Uke
- (4) Which of the following is the skill of Hand Block ?  
(A) Jodan Juke      (B) Hiza Geri      (C) Mae Geri      (D) Jodan Uke
- (5) Where cannot it be attacked in Karate ?  
(A) On stomach      (B) On waist      (C) On shoulder      (D) On mounts
- (6) What is the match timing for junior group in Karate ?  
(A) 3 minutes      (B) 4 minutes      (C) 2 minutes      (D) 1 minutes
- (7) In which attack is the player awarded 3 points ?  
(A) Niton      (B) Ippon      (C) Sunbon      (D) Keikok
- (8) For which error is the opponent given 1 point ?  
(A) Hansoku Sui      (B) Keikoku      (C) Hansoku      (D) Ippon
- (9) What cannot be used in Karate game ?  
(A) Head guard      (B) Chest guard      (C) Chain guard      (D) Metal bangle
- (10) How many types of Karate are there ?  
(A) One      (B) Two      (C) Three      (D) Four

