*Strictly according to the latest syllabus prescribed by the Central Board of Secondary Education, New Delhi*

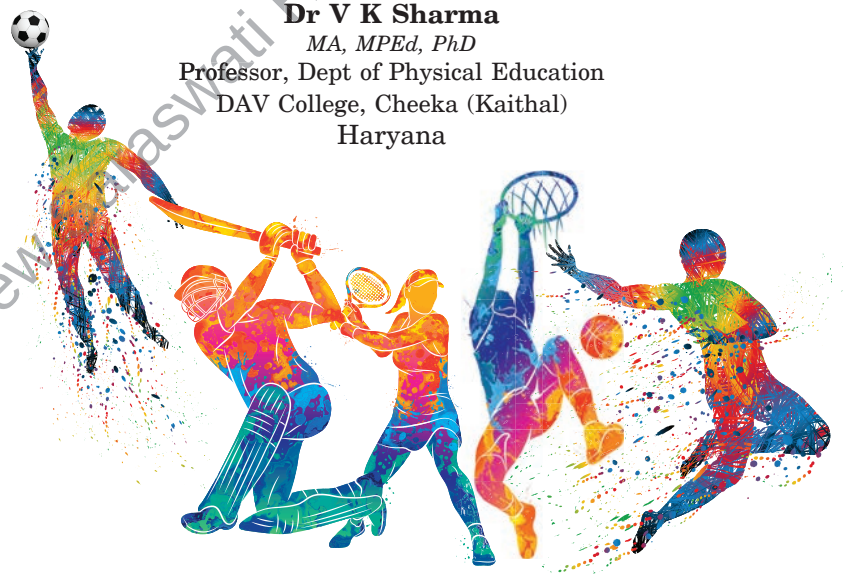
*Saraswati*

# HEALTH AND PHYSICAL EDUCATION

## Supplementary Book

XII

**Dr V K Sharma**
*MA, MPEd, PhD*
Professor, Dept of Physical Education
DAV College, Cheeka (Kaithal)
Haryana



© New Saraswati House (India) Private Limited

**New Saraswati House (India) Private Limited**
**New Delhi-1100 02 (INDIA)**

# NEWLY ADDED TOPICS IN PHYSICAL EDUCATION

(Based on the Syllabus released by CBSE on 31st March 2023
for the academic session 2023-24)

**For Class-XII**

**UNIT 1 : Management of Sporting Events**

- Combination tournaments.
- Intramural & Extramural tournaments – Meaning, Objectives & itsSignicance
- Community sports program (Sports Day, Health Run, Run for Fun, Run for Specic Cause & Run for unity).

**UNIT 2 : Children & Women in Sports**

- Exercise guidelines of WHO for different age groups.
- Women's participation in Sports – Physical, Psychological, and Social benefits.

**UNIT 3 : Yoga as Preventive Measure for Lifestyle Disease**

- Back Pain and Arthritis: Procedure, Benefits & Contraindications of
  Tadasana, Urdhawahastotasana,
  Ardh-Chakrasana, Ushtrasana, Vakrasana, Sarala Matsyendrasana, Bhujangasana, Gomukhasana, Bhadrasana, Makarasana, Nadi Shodhana pranayama.

**UNIT 4 : Physical Education and Sports for CWSN**

- Concept of Classication and Divisioning in Sports
- Concept of Inclusion in sports, its need, and implementation

**UNIT 5 : Sports & Nutrition**

- Eating for Weight control—A Healthy Weight, The Pitfalls of Dieting, Food Intolerance, and Food Myths
- Importance of Diet in Sports—Pre, During and Post competition Requirements

**UNIT 6 : Test & Measurement in Sports**

- Measurement of CardioVascular Fitness –

$$\text{Harvard Step Test} = \frac{\text{Duration of the Exercise in Seconds} \times 100}{5.5 \times \text{Pulse count of 1-1.5 Min after Exercise}}$$

- Johnsen – Methney Test of Motor Educability (Front Roll, Roll, Jumping Half-Turn, Jumping Full-Turn)

**UNIT 7 : Physiology & Injuries in Sports**

- Physiological changes due to ageing

**UNIT 8 : Biomechanics and Sports**

- Types of Levers and their Application in Sports

**UNIT 9 : Psychology and Sports**

- Motivation, its type & techniques.
- Exercise Adherence: Reasons, Benefits & Strategies for Enhancing it

**UNIT 10 : Training in Sports**

- Circuit Training - Introduction & its Importance

© New Saraswati House (India) Private Limited

# CONTENTS


- **New Syllabus 2023-24** ..... (iv)

**Unit 1 : Management of Sporting Events** ..... **7**
- Combination tournaments.
- Intramural & Extramural tournaments – Meaning, Objectives & itsSignicance
- Community sports program (Sports Day, Health Run, Run for Fun, Run for Specic Cause & Run for unity).

**Unit 2 : Children & Women in Sports** ..... **22**
- Exercise guidelines of WHO for different age groups.
- Women's participation in Sports – Physical, Psychological, and Social benefits.

**Unit 3 : Yoga as Preventive Measure for Lifestyle Disease** ..... **28**
- Back Pain and Arthritis: Procedure, Benefits & Contraindications of Tadasana, Urdhawahastotasana, Ardh-Chakrasana, Ushtrasana, Vakrasana, Sarala Matsyendrasana, Bhujangasana, Gomukhasana, Bhadrasana, Makarasana, Nadi Shodhana pranayama.

**Unit 4 : Physical Education and Sports for CWSN** ..... **33**
- Concept of Classication and Divisioning in Sports
- Concept of Inclusion in sports, its need, and implementation

**Unit 5 : Sports & Nutrition** ..... **39**
- Eating for Weight control—A Healthy Weight, The Pitfalls of Dieting, Food Intolerance, and Food Myths
- Importance of Diet in Sports—Pre, During and Post competition Requirements

**Unit 6 : Test & Measurement in Sports** ..... **53**
- Measurement of CardioVascular Fitness –

$$\text{Harvard Step Test} = \frac{\text{Duration of the Exercise in Seconds} \times 100}{5.5 \times \text{Pulse count of 1-1.5 Min after Exercise}}$$

- Johnsen–Methney Test of Motor Educability (Front Roll, Roll, Jumping Half-Turn, Jumping Full-Turn)

**Unit 7 : Physiology & Injuries in Sports** ..... **58**
- Physiological changes due to ageing

**Unit 8 : Biomechanics and Sports** ..... **61**
- Types of Levers and their Application in Sports

**Unit 9 : Psychology and Sports** ..... **64**
- Motivation, its type & techniques.
- Exercise Adherence: Reasons, Benefits & Strategies for Enhancing it

**Unit 10 : Training in Sports** ..... **75**
- Circuit Training - Introduction & its Importance



This material is designed to be used as a supplementary with
**Saraswati Health and Physical Education-XII**
(ISBN: 978-93-55572-89-9)


© New Saraswati House (India) Private Limited

# Syllabus-XII

| THEORY | Max. Marks 70 |
|---|---|

**Unit-I : Management of Sporting Events**

- Functions of Sports Events Management (Planning, Organising, Staffing, Directing & Controlling)
- Various Committees & their Responsibilities (pre; during & post)
- Fixtures and their Procedures–Knock-Out (Bye & Seeding) & League (Staircase, Cyclic, Tabular method) and Combination tournaments.
- Intramural & Extramural tournaments – Meaning, Objectives & Its Significance
- Community sports program (Sports Day, Health Run, Run for Fun, Run for Specific Cause & Run for Unity)

**Unit-II : Children & Women in Sports**

- Exercise guidelines of WHO for different age groups.
- Common postural deformities-knock knees, flat foot, round shoulders, Lordosis, Kyphosis, Scoliosis, and bow legs and their respective corrective measures.
- Women's participation in Sports – Physical, Psychological, and social benefits.
- Special consideration (menarche and menstrual dysfunction)
- Female athlete triad (osteoporosis, amenorrhea, eating disorders

**Unit-III : Yoga as Preventive measure for Lifestyle Disease**

- **Obesity:** Procedure, Benefits & Contraindications for Tadasana, Katichakrasana, Pavanmuktasana, Matsayasana, Halasana, Pachimottansana, Ardha– Matsyendrasana, Dhanurasana, Ushtrasana, Suryabedhan pranayama.
- **Diabetes:** Procedure, Benefits & Contraindications for Katichakrasana, Pavanmuktasana,Bhujang asana, Shalabhasana, Dhanurasana, Supta- vajarasana, Paschimottanasana, Ardha-Mastyendrasana, Mandukasana, Gomukasana, Yogmudra, Ushtrasana, Kapalabhati.
- **Asthma:** Procedure, Benefits & Contraindications for Tadasana, Urdhwahastottansana, UttanMandukasan-a, Bhujangasana, Dhanurasana, Ushtrasana, Vakrasana, Kapalbhati, Gomukhasana Matsyaasana, Anuloma- Viloma.
- **Hypertension:** Procedure, Benefits & Contraindications for Tadasana, Katichakransan, Uttanpadasana, Ardha Halasana, Sarala Matyasana, Gomukhasana UttanMandukasan-a, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadi-shodhanapranayam, Sitlipranayam UttanMandukasan-a, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadi- shodhanapranayam, Sitlipranayam.
- **Back Pain and Arthritis:** Procedure, Benefits & Contraindications of Tadasan, Urdhawahastootansana, Ardh-Chakrasana, Ushtrasana, Vakrasana, Sarala Maysyendrsana, Bhujandgasana, Gomukhasana, Bhadrasana, Makarasana, Nadi-Shodhana pranayama

**Unit-IV : Physical Education & Sports for CWSN (Children with Special Needs - Divyang)**

- Organizations promoting Disability Sports (Special Olympics; Paralympics; Deaflympics)
- Concept of Classification and Divisioning in Sports.
- Concept of Inclusion in sports, its need, and Implementation;
- Advantages of Physical Activities for children with special needs.
- Strategies to make Physical Activities assessable for children with special needs

© New Saraswati House (India) Private Limited

**Unit V: Sports & Nutrition**

- Concept of balanced diet and nutrition
- Macro and Micro Nutrients: Food sources & functions
- Nutritive & Non-Nutritive Components of Diet
- 4. Eating for Weight control–A Healthy Weight, The Pitfalls of Dieting, Food Intolerance, and Food Myths
- Importance of Diet in Sports-Pre, During and Post competition Requirements

**Unit VI: Test & Measurement in Sports**

- Fitness Test – SAI Khelo India Fitness Test in school: Age group 5-8 years/ class 1-3: BMI, Flamingo Balance Test, Plate Tapping Test Age group 9-18yrs/ class 4-12: BMI, 50mt Speed test, 600mt Run/Walk, Sit & Reach flexibility test, Strength Test (Partial Abdominal Curl Up, Push- Ups for boys, Modified Push-Ups for girls).
- Measurement of Cardio- Vascular Fitness – Harvard Step Test – Duration of the Exercise in Seconds x100/5.5 X Pulse count of 1-1.5 Min after Exercise.
- Computing Basal Metabolic Rate (BMR)
- Rikli & Jones - Seniorm Citizen Fitness Test
  - ☞ Chair Stand Test for lower body strength
  - ☞ Arm Curl Test for upper body strength
  - ☞ Chair Sit & Reach Test for lower body flexibility
  - ☞ Back Scratch Test for upper body flexibility
  - ☞ Eight Foot Up & Go Test for agility
  - ☞ Six-Minute Walk Test for Aerobic Endurance
- Johnsen – Methney Test of Motor Educability (Front Roll, Back Roll, Jumping Half-Turn, Jumping full- turn

**Unit VII: Physiology & Injuries in Sports**

- Physiological factors determining components of physical fitness
- Effect of exercise on the Muscular System
- Effect of exercise on the Cardio-Respiratory System
- Physiological changes due to aging
- Sports injuries: Classification (Soft Tissue Injuries -Abrasion, Contusion, Laceration, Incision, Sprain & Strain; Bone & Joint Injuries - Dislocation, Fractures - Green Stick, Comminuted, Transverse Oblique & Impacted)

**Unit VIII Biomechanics & Sports**

- Newton's Law of Motion & its application in sports
- Types of Levers and their application in Sports.
- Equilibrium—Dynamic & Static and Centre of Gravity and its application in sports
- Friction & Sports
- Projectile in Sports

**Unit IX Psychology & Sports**

- Personality; its definition types (Jung Classification & Big Five Theory)
- Motivation, its type & techniques.
- Exercise Adherence: Reasons, Benefits & Strategies for Enhancing it
- Meaning, Concept & Types of Aggressions in Sports
- Psychological Attributes in Sports – Self-Esteem, Mental Imagery, Self- Talk, Goal Setting

© New Saraswati House (India) Private Limited

**Unit X Training in Sports**

- Concept of Talent Identification and Talent Development in Sports
- Introduction to Sports Training Cycle – Micro Meso, Macro Cycle.
- Types & Methods to Develop – Strength, Endurance, and Speed.
- Types & Methods to Develop – Flexibility and Coordinative Ability.
- Circuit Training - Introduction & its importance

## PRACTICAL

**Marks 30**

| | | |
|---|---|---|
| 01. | Physical Fitness Test: SAI Khelo India Test, Brockport Physical Fitness Test (BPFT)* | 6 Marks |
| 02. | Proficiency in Games and Sports (Skill of any one IOA recognised Sport/Game of Choice)** | 7 Marks |
| 03. | Yogic Practices | 7 Marks |
| 04. | Record File *** | 5 Marks |
| 05. | Viva Voce (Health/ Games & Sports/ Yoga) | 5 Marks |

* Test for CWSN (any 4 items out of 27 items. One item from each component: Aerobic Function, Body Composition, Muscular strength & Endurance, Range of Motion or Flexibility)

** CWSN (Children With Special Needs – Divyang): Bocce/Boccia , Sitting Volleyball, Wheel Chair Basketball, Unified Badminton, Unified Basketball, Unified Football, Blind Cricket, Goalball, Floorball, Wheel Chair Races and Throws, or any other Sport/Game of choice.

** Children With Special Needs can also opt any one Sport/Game from the list as alternative to Yogic Practices. However, the Sport/Game must be different from Test - 'Proficiency in Games and Sports'

*** Record File shall include:

- Practical-1: Fitness tests administration.
- Practical-2: Procedure for Asanas, Benefits & Contraindication for any two Asanas for each lifestyle disease.
- Practical-3: Anyone one IOA recognised Sport/Game of choice. Labelled diagram of Field & Equipment. Also mention its Rules, Terminologies & Skills.

© New Saraswati House (India) Private Limited

CHAPTER 1

# Management of Sporting Events

### 3. Tabular Method*

Tabular method is called graph method. If the number of teams is in even number such as 2, 4, 6, 8, 10, etc., then N + 1 squares are made vertically and horizontally where N represents the number of teams participating in the tournament. If the number of teams is in odd number such as 3, 5, 7, 9, 11, etc., then N + 2 squares are made vertically and horizontally. For example, if 7 teams are participating in league tournament then N + 2, *i.e.,* 7 + 2 = 9 squares are to be made. After that a diagonal line is drawn from the left side of the top to the right side of the bottom.

**Method of Putting the Numbers in Squares.** First of all, write down the names of the teams such as A, B, C, D, etc. vertically as well as horizontally on left side squares and upper side squares. If the number of teams is in odd number, write down 'Bye' in the last columns of both sides.

**Example 1:** Draw a fixture of 6 teams according to tabular method of league tournament.

Number of teams = 6

**Solution:** Squares = N + 1 = 6 + 1 = 7 Squares

Number of rounds = 5

Number of matches

$$= \frac{N(N-1)}{2} = \frac{6(6-1)}{2} = \frac{6\times5}{2} = \frac{30}{2} = 15 \text{ matches}$$

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| A | | 1 | 2 | 3 | 4 | 5 |
| B | | | 3 | 4 | 5 | 2 |
| C | | | | 5 | 1 | 4 |
| D | | | | | 2 | 1 |
| E | | | | | | 3 |
| F | | | | | | |

| IR | IIR | IIIR | IVR | VR |
|---|---|---|---|---|
| A × B | A × C | B × C | B × D | C × D |
| C × E | D × E | A × D | A × E | B × E |
| D × F | B × F | E × F | C × F | A × F |

**Example 2:** Draw a fixture of 7 teams by using tabular method.

**Solution :** Number of teams = 7

Number of matches = $\frac{N(N-1)}{2} = \frac{7(7-1)}{2} = \frac{7\times6}{2}$

$= \frac{42}{2}$ = 21 matches

Number of columns or squares = N + 2 = 7 + 2 = 9 squares

Number of rounds = 7 rounds

* Read after Staircase Method on Page p22 of Saraswati Health & Physical Education-XII

© New Saraswati House (India) Private Limited

| | A | B | C | D | E | F | G | Bye |
|---|---|---|---|---|---|---|---|---|
| A | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| B | | | 3 | 4 | 5 | 6 | 7 | 2 |
| C | | | | 5 | 6 | 7 | 1 | 4 |
| D | | | | | 7 | 1 | 2 | 6 |
| E | | | | | | 2 | 3 | 1 |
| F | | | | | | | 4 | 3 |
| G | | | | | | | | 5 |
| Bye | | | | | | | | |

| I R | II R | III R | IV R | V R | VI R | VII R |
|---|---|---|---|---|---|---|
| A × B | A × C | B × C | B × D | C × D | C × E | D × E |
| D × F | E × F | A × D | A × E | B × E | B × F | C × F |
| C × G | D × G | E × G | F × G | A × F | A × G | B × G |
| E × Bye | B × Bye | F × Bye | C × Bye | G × Bye | D × Bye | Ax Bye |

## Combination Tournaments

Combination tournaments are conducted when the matches are to be played on group basis or zonal basis. As a matter of fact, these tournaments depend on the suitability of the activity, the number of participating teams and the areas and distance from which they come to participate. For example, in case of national-level competition, it becomes difficult for all the state teams to reach the designated place for tournament. To avoid such a type of difficulty, at least four zones can be made and a tournament can be organised at a central place in each zone. After that the winner of each zone can participate at the national level. Depending upon the number of teams in each zone and the availability of time, the tournament can be organised on the basis of knock-out or league and after that at national level the tournament can also be conducted either on knock-out or league basis. Usually, the following combinations of tournaments are used.

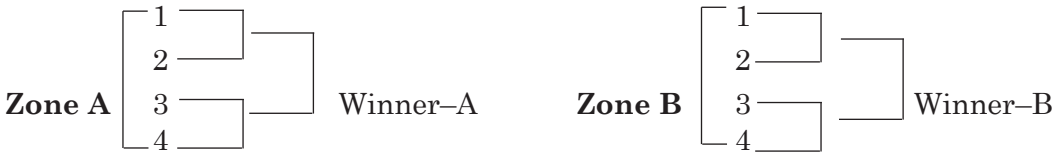
1. Knock-out cum Knock-out
2. League cum League
3. Knock-out cum League
4. League cum Knock-out

The description of the above-mentioned combination tournaments is given below.

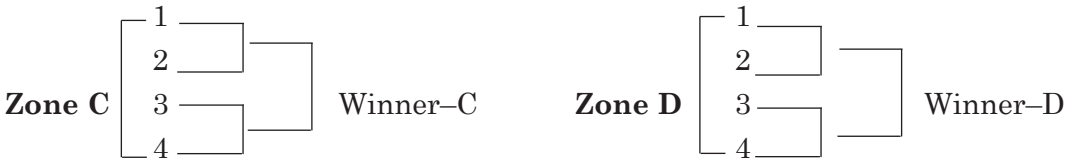
### 1. Knock-out cum Knock-out

In this type of tournament, the total number of teams are divided into four equal zones. First of all the teams of each zone play on knock-out basis. In this way, a team becomes the winner from each zone. All the four winner teams again play their matches on knock-out basis. The team that wins in the final becomes the winner of the inter-zonal tournament.

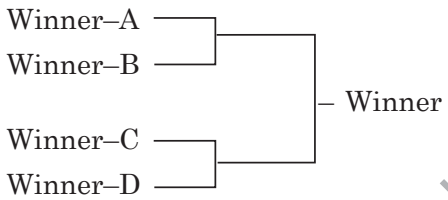
***Example***: Zonal Tournament on Knock-out basis




© New Saraswati House (India) Private Limited



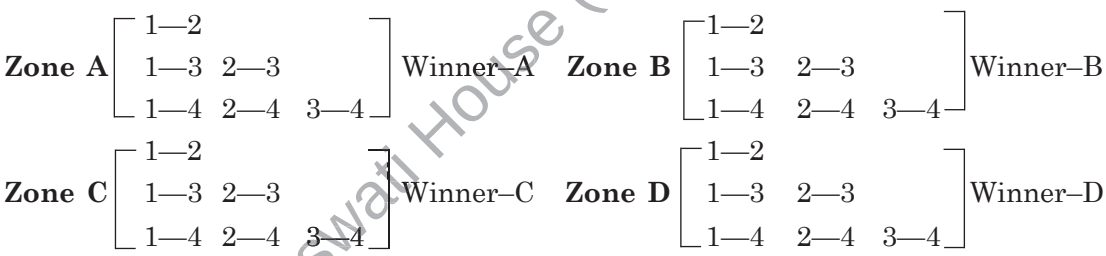

***Example***: Inter-zonal Tournament on Knock-out basis



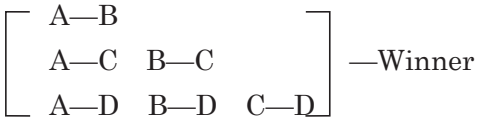

## 2. League cum League

In this type of tournament, total number of teams are divided into four zones. All the teams play their matches in their respective zones on league basis. One team from each zone becomes the zonal winner. It is called the zonal or group tournament. After that all the zonal winner teams again play the matches on league basis and one team becomes the winner of the inter-zonal or group tournament.

***Example***: Group or Zonal Tournament on League basis




***Example***: Inter-group or Zonal Tournament on League basis

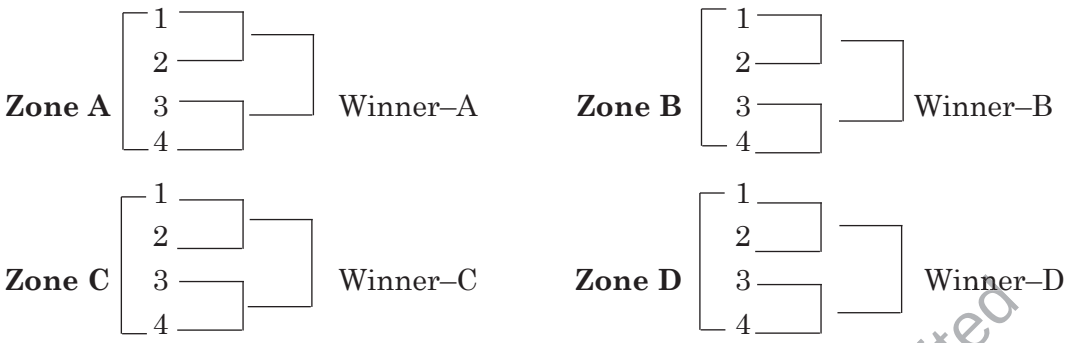



## 3. Knock-out cum League

All the teams are divided into four zones. First of all the teams play their matches in their respective zones on knock-out basis and one team becomes the winner from each zone. After that, the four winner teams again play their matches on league base and one team becomes the winner of the inter-group or zone tournament.

***Example***: Group or Zonal Tournament on Knock-out basis

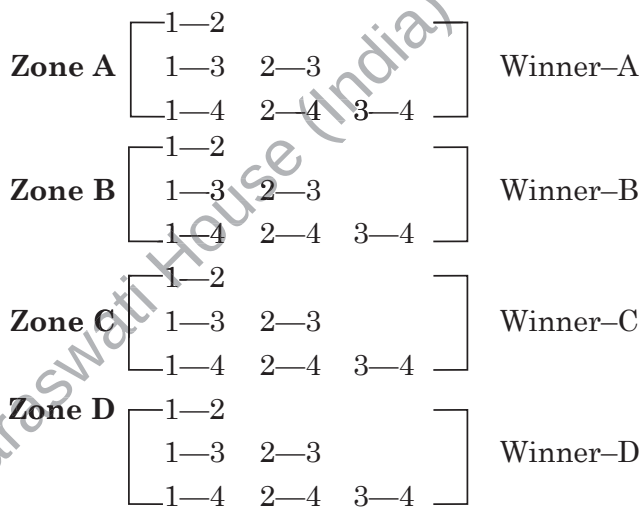
© New Saraswati House (India) Private Limited



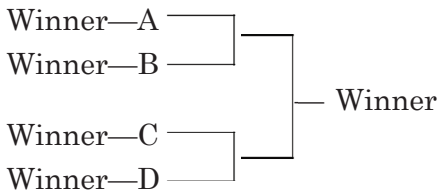

### 4. League cum Knock-out Tournament

All the teams are divided into four zones. All the teams play their matches in their respective zones on league basis. One team from each zone or group becomes the winner. It is called the zonal tournament. After that, the four winner teams play their matches on knock-out basis and one team becomes the winner of the inter group or zonal tournament.

***Example*:** Group or Zonal Tournament on League basis




***Example*:** Inter-group or Zonal Tournament on Knock-out basis




© New Saraswati House (India) Private Limited

## 4. INTRAMURAL AND EXTRAMURAL: MEANING, OBJECTIVES AND THEIR SIGNIFICANCE

### Meaning of Intramural

The word 'Intramural' is derived from the Latin words 'Intra' and 'Muralis'. 'Intra' means 'within' and 'Muralis' means 'wall'. It means that the activities which are performed within the walls or within the campus of an institution are called 'intramurals.' These activities are organised only for the students of a school or an institution. No student of other schools can participate in these activities. In fact, intramural competition is one of the best means to motivate all the students of an institution for taking part in the games and sports. 'A game for each and each for a game' may be considered the motto of intramurals. There is no doubt that regular physical education programmes develop good habits, skills, knowledge and other social qualities in the students but the effective programmes of intramurals may enhance further development. Various competitions of sports and games such as at the levels of block, zone, district, state as well as at national are held every year for the students but all the students cannot participate in these competitions. It is usually seen that approximately 5 per cent students of a school are selected to participate in such competitions. Have we ever thought about the remaining percentage of students of a school? The intramural programmes can solve this problem because these programmes offer ample opportunities for voluntary participation and competition among the students in the same institution.

These activities are the most pleasurable as well as enjoyable for the students. They get maximum educational benefits from such competitions. So, a large number of students must be involved in a wide range of intramural activities.

### Origin of Intramurals

It is well known that children have a tendency to play. It is an innate or inborn instinct in them. They used to take part in such activities within the walls of their school in the ancient period also during their leisure time. Probably, it was the beginning of intramurals. With the passage of time, these activities were developed in a systematic way and termed as intramurals. In the USA, the intramural of baseball was organised in 1864. After that in the beginning of the 20th century, some progressive physical education teachers showed interest in intramurals and they realised that through intramurals, physical education can be developed more extensively. In 1925, every high school started the mission to establish intramural department in the USA. As a result of such focus on developing intramurals, the programmes of physical education are not considered complete and successful if intramurals are not organised in every school or institution. But in India, we lag behind in this field. As a matter of fact, there are various reasons behind the failure of intramurals taking off in India. The foremost reason is the materialistic approach of most of the people involved. The maximum number of parents want their children

© New Saraswati House (India) Private Limited

to devote maximum time on studies. Such parents are not concerned with the physical and social development of their children. The second reason is the lack of good programmes of intramurals in schools. In fact, most of the schools do not show any interest in organising intramurals for each and every student. In fact, intramurals must be organised even for less abled or differently abled students. In a democratic society, they have equal rights to participate in such programmes. Only then can the real benefits of intramurals be achieved.

## Significance of Intramurals

In simple term, intramural means, 'A game for each and each for a game'. So, it can be said that intramural activities are significant for every student of each class of an institution. The following points can express the significance of intramurals for students.

1. Intramurals are significant for physical, mental, emotional and social development of students.
2. These programmes also lay stress on moral and ethical values of students.
3. Intramurals are necessary for the development of health of children.
4. These programmes are also important to tone down the fighting instinct of children.
5. These programmes refresh the children and make them agile.
6. Intramurals provide maximum recreation to the students.
7. They provide ample opportunities to the students to participate in games and sports.
8. They are also essential for developing leadership qualities among the students.

## Objectives of Intramurals

There are various objectives of intramurals which are described below.

1. **To Provide Opportunity to Every Student to Participate in Games and Sports:** To provide ample opportunities to every student in games and sports is one of the major objectives of intramurals. Generally, a few students are able to participate in zonal-level and district-level games and sports. So, mass participation of students from a school is impossible at such levels of competitions. But in intramurals each and every student can take part in games and sports. In fact, every student is free to participate in the games and sports of his/her choice. So, it can be said that providing ample opportunities to all the students to participate in games and sports is the major objective of intramurals.
2. **To Develop Leadership Qualities Among Students:** To develop the leadership qualities among students is another significant objective of intramurals. Intramural activities are helpful in developing leadership qualities among the students who participate in these activities. Although all the students do not become leaders, intramural activities help in developing leadership qualities among those students who have some innate qualities of

© New Saraswati House (India) Private Limited

leadership. Other students develop the qualities of followers which are equally important.

3. **To Develop Cooperation:** A person cannot succeed all by himself in the field of sports and games. In fact, cooperation is essential to achieve an apex position in games and sports. We cannot think about winning, especially in team games if the players do not cooperate with each other. Intramural activities help in developing cooperation among students.
4. **To Provide Recreation:** To provide recreation to the students is another vital objective of intramurals. In fact, intramural activities provide a number of opportunities for recreation to the students. Students participate in intramural activities according to their interests. Hence, they get a lot of joy, fun and pleasure by participating in such intramural activities/competitions.
5. **To Develop Feeling of Sportsmanship:** To develop the feeling of sportsmanship is another vital objective of intramurals. Sportsmanship means to show respect and courtesy to opponents and officials. It also means to be humble in victory and gracious in defeat. The intramural competitions encourage such qualities among students who participate in such activities.
6. **To Provide an Opportunity to Learn a Variety of Games and Skills:** To provide the opportunity to learn a number of games, their fundamental skills, rules and regulations and impart technical and tactical knowledge is another important objective of intramurals. Though there is no doubt that regular programme of physical education provides the previously mentioned opportunity but intramural activities provide additional opportunity to be efficient in various games. In fact, students get a number of opportunities to participate in various types of games in intramurals.
7. **To Provide an Opportunity to Get an Experience of Organising Competitions:** To provide an opportunity to the students to get an experience in organising competitions is also an objective of intramurals. In intramural competitions, a number of committees are formed for their smooth organisation in which students are also involved directly or indirectly. So, by taking up these responsibilities, students also get an experience in organising games and sports.
8. **To Identify Talented Sportspersons:** This is also a significant objective of intramurals. It is a well-known fact that every nation of the world wants to win medals at international level such as World Cup and Olympics. It is easier said than done. In the previous century, the Germans adopted 'catch them young' technique. Intramural competitions aid to identify the talented sportspersons due to participation of all the students in such competitions.
9. **To Provide an Opportunity to Develop Personality:** Providing an opportunity to students to develop their personality is another objective of intramural activities. These activities provide a number of opportunities that help develop physical, mental, social and emotional aspects of personality.

© New Saraswati House (India) Private Limited

## Activities for Intramural Competition

There are a number of activities which may be included in intramural competitions. The activities for intramurals should be selected very carefully. Mainly, the selection of activities should be based on two factors viz. interests of students and availability of facilities in the institution or school. Along with these, we should not forget the recreational aspect of intramurals. All the intramural activities must provide recreation to the students.These activities should aid in achieving the goals of education and contribute to general development of the students. Hence, the selection should be made out of the following categories of activities:

1. **Major Games:** Volleyball, Hockey, Cricket, Basketball, Kabaddi, Swimming, Athletics, Cycling, Wrestling, Lawn tennis, Football, Softball, Badminton, etc.
2. **Minor Games:** Shuttle Runs, Kho-Kho, Circle games, Tag game, Roller skating, Potato Race, Sack Race, Three-Legged Race, etc.
3. **Rhythmics:** Lazium, Dumb bell, Marching, Folk dance, Group dance, Solo dance, Mass PT, Rhythmic gymnastic, etc.
4. **Creative Activities:** Painting, Drawing, Sculpturing, Making models.
5. **Combative Activities:** Boxing, Judo, Taekwondo, Karate, etc.

## Meaning of Extramural

The word 'Extramural' is derived from the Latin words 'Extra' and 'Muralis'. 'Extra' means 'outside' and 'Muralis' means 'wall'. It means that the activities, which are performed outside the walls of an institution or a school. It points towards the activities that are organised by an institution/school and also the students of two or more schools participate in them. In fact, in extramural competitions, the students of other schools also participate in sports-related activities. Extramural competitions are also called inter-school competitions. Extramurals are fixed well in advance so that the students of other schools may prepare well for such competitions.

## Significance of Extramural Competitions

Extramural competitions are significant in the field of physical education because without extramural competitions, the programmes of physical education remain incomplete. The following points show the significance of extramural competitions.

1. **Provide Opportunities to Schools to Show their Sports Capabilities:** Extramural competitions provide ample opportunities to schools to showcase their sports capabilities. If the students of a school have good sports capabilities and show good performance in extramurals, it will add a feather to the cap of that institution. This will enhance the image of that institution.
2. **Enhance the Standard of Sports Performance:** Through extramural competitions, the standard of sports performance can be enhanced. Especially the losing individual or team can make strenuous efforts to improve their sports performance in the next extramural competition.
3. **Provide Appropriate Knowledge of Sports Techniques:** Extramurals are essential to provide appropriate knowledge of new techniques of sports. The

© New Saraswati House (India) Private Limited

teams that are not familiar with the appropriate as well as advanced techniques of various sports and games, can imbibe such knowledge by participating in extramurals.

4. **Plan and Implement the Programmes of Physical Education More Effective:** Extramurals are essential for planning and implementing the programmes of physical education more effective. Extramurals also help in broadening the base of sports.
5. **Improve the Opportunities to Participate in Sports:** Extramural competitions provide opportunities to the students of various schools to participate in sports. Many schools that usually do not take part in such competitions are motivated and consequently such schools tend to participate in extramurals.

## Objectives of Extramurals

1. **To Improve the Standard of Sports:** It is one of the objectives of inter-school or extramural competitions to improve the standard of sports. By participating in extramurals, the students become technically and tactically efficient in respective sports. They become skillful. They develop abilities to perform well in competitions. In this way, extramurals improve the standard of sports.
2. **To Provide Enriching Experience to Students:** Experience has its own value in any field. Extramurals provide experience to students who participate in such competitions. By gaining experience through continuous participation, students exhibit good performance in competitions.
3. **To Develop Sportsmanship and a Feeling of Fraternity:** To develop sportsmanship and a feeling of fraternity in students is another important objective of extramural competitions.
4. **To Broaden the Base of Sports:** Many students from various schools participate in extramurals. Other schools, that do not participate in extramurals, get motivated to do so. Such motivation broadens the base of sports.
5. **To Provide Knowledge of New Rules and Advanced Techniques:** To provide knowledge of new rules, regulations, advanced techniques and tactics of sports and games to the students is another objective of extramurals. Students come to know about new rules and regulations of the games and sports. They learn new techniques as well as tactics which enable them to perform efficiently and thus helps in improving their performance.

© New Saraswati House (India) Private Limited

## 5. COMMUNITY SPORTS—PURPOSE AND BENEFITS

## Community Sports

Community sports consists of two words, i.e, community and sports. To have a clear-cut meaning of these two words, it is essential for us to understand the concept of community sports.

**Meaning of Community:** A community can be a group of children/youth, who share geographical connection, such as studying in the same school/college or living in the same town or neighbourhood and who interact socially. A community may also be defined as children/youth who have common characteristics, such as shared religious belief or something that distinguishes them—may be they are infirm or have disability. A common interest may bring together the youths or people who have a passion for a sport or physical activity.

**Meaning of Sports:** Sports means all forms of physical activity which, through causal or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competitions.

Sports may also be defined as any form of physical activity that contribute to physical fitness, mental well-being and social interaction such as playing, recreation, organized or competitive sport and indigenous sports and games.

So **"Community sports"** are those organized physical activities that are based in community, school and local sports organisations. Community sport is an essential and significant pillar of any well-functioning community. Community sports provide many opportunities for as many people as possible to participate in sports.

In fact, communities which participate in sports develop strong social bonds. People, who live in such communities are usually healthier, and happier in comparison to the people who do not participate in sports. Community sport is widely seen as a way for the people of different backgrounds to interact and integrate.

**Purpose.** The main purpose of community sports is to build stronger, healthier, happier and safer communities. It's purpose is also to build character, to develop strategic thinking, leadership qualities, good setting, risk taking and shaping personality. Conclusively, it can be said that the overall purpose of community sports is to aid the holistic development of children and youth.

## Benefits of Community Sports

Community sports play a significant role in all round development of children and youth if they participate regularly in such sports. There are various benefits of community sports which are described below:

1. **Helps in Improving Physical Health:** Community sport helps in improving physical health of those who take part is community sports activities regularly. Even World Health Organization recommends that children as well as youth should have at least one hour of moderate to vigorous physical activities everyday. These sports activities strengthen bones and muscles, improve cardio-respiratory fitness. These sports activities also improve speed, flexibility and other coordinative abilities.

© New Saraswati House (India) Pvt. Limited

2. **Helps in Improving Mental and Emotional Health:** No doubt, community sports provide ample opportunities to be physically healthy, but these activities also help in improving emotional and mental health. These sports improve mental our emotional health by reducing isolation as well as loneliness. Sports activities trigger the release of chemical hormones like endorphins and serotonin, which make us feel happy and reduce the levels of stress hormone called cortisol. As a result of these hormones, our mood is elevated. These activities help in soothing and calming our mind. The calmer the mind, more efficient would be our emotional and mental health.

3. **Helps in Improving Social Health:** Community sports help in improving social health of children and youth. These activities help children and youth to develop many of the social skills they will need for life. Community sports teach them to cooperate, to be less selfish, give them a sense of belonging and help in developing courtesy, fair play, tolerance, sympathy, etc. Community sports also provide vehicle for inclusion, drawing together children and youth of different races, religions and cultures.

4. **Helps in Learning to Overcome Challenges and Obstacles:** There are many benefits of community sports outside the sports field. When children participate in community sports, they learn to make quick decisions while playing sports. The frustration of defeat is also learnt by participating in community sports. This can be tough for many to face but is ultimately inevitable. They gain the ability to compassionate loser and see how it is possible to learn from these situations. Finally, community sports help children to learn how to solve problems and overcome obstacles and challenges. The ability to take on problems and work through them is a valuable skill, which the children/youth will carry with them into adulthood.

5. **Plays a Vital Role in Reducing Crime Rates:** Community sports play a vital role in reducing crime rates. A combination of various risks factors, including boredom and lack of proper supervision can lead to abusive or delinquent behaviour. Community sports is the best means to provide a positive as well as healthy outlet for suppressed negative emotions. In these sports, children spend their free time and relieve boredom, which is one of the biggest factors in youth. Regular participation in community sports team also reduces their anti-social behaviour.

6. **Helps in Building Stronger Community:** Community sports are helpful in building stronger community by bringing children and youth together. These sports provide vehicle for inclusion, drawing together people of different races, religious and cultures. These sports bring people together by providing opportunities for social interaction. These sports also provide appropriate exposure to different peer group values. In this way, community sports help in building stronger community.

7. **Provides Social Benefits:** Community sports help children and youth to develop many of social skills they will need for life. These sports teach them to cooperate, to be less selfish and to listen to other children. These sports give children a sense of belonging and help them to make new friends and enlarge their social circle. Community sports help in developing various social qualities such as patience, sympathy, cooperation, cohesion, dedication and working together.

© New Saraswati House (India) Private Limited

8. **Helps in Making Connections:** As children and youth grow and develop, they learn to make connections in order to understand how the world works. As a matter of fact, community sports provide a good way for children and youth to make connections as these sports allow to find mentors. These sports also allow for parents with kids to connect with other parents at sporting events, increasing their networking and strengthening the community. Community sports help in bringing a community together, in increasing meaningful connections and social bonds. They are a great facilitator for community engagement and interaction. They also build appropriate connections within your neighbourhoods. Community sports is a significant means to meet people who share the same interest as you.

9. **Helps in Developing a Sense of Belonging:** Community sports help in developing a sense of belonging. The feeling of belonging can have a vital impact on physical and mental health. In fact, being a part of a community sports, children can make all the difference in terms of their self-esteem, personal development and stress management. Community sports can help them to connect with other group in a group setting as they work together towards common objectives which can lead to a strong sense of belonging for every individual in the group.

10. **Helps in Economic Condition :** Community sports are helpful in reducing the total expenditure made on health. First of all, these sports are capable to develop the health and fitness of individuals who participate regularly in these sports. They do not fall prey to diseases owing to good immunity power. Secondly, those individuals who take part in community sports programmes get sufficient amount of money as prizes in various competitions so they are economically helped in such a way.

Conclusively, it can be said that community sports help in building stronger, healthier, happier and safer communities. Community sports are beneficial in the holistic development of children and youth.

## Community Sports Programmes

Community sport events are usually held in cities, schools and colleges or nearby area in villages where maximum numbers of community participate frequently. They may be young ones, adolescents, adults and old age persons. They get a lot of enjoyment by taking part in such sports. These community sport events/programmes are described below:

### Sports Day

In the contemporary age, specific stress is laid down on the holistic development of children in schools. Owing to this, emphasis is laid on other co-curricular activities in addition to education. Along these lines, sports day is organised so that the all-round development of children could be attempted. Various sports activities in which physical and recreational activities are included, are conducted on sports day. Generally, sports day is organised by each and every school. A specific day

Global sports programme

© New Saraswati House (India) Private Limited

is fixed for conducting sports day in a year. On that day, ample opportunities are provided to every child to take part in activities. School authorities also lay stress on the maximum participation of children.

These activities are vital for children. By participating in these activities, students develop leadership qualities in them. Their interest in such activities is enhanced. The activities, that are conducted on sports day, provide ample opportunities for recreation to children. The health condition of children is also improved as they take part in such activities. Various social qualities such as honesty, brotherhood, friendship, cooperation, tolerance, unity, feeling of respect and group cohesion are instilled in children as they take part in sports activities such as minor games and other recreational activities.

### Procedure of Organising Sports Day

First of all, a specific day should be fixed for organising sports day. The appropriate place should also be selected as early as possible. In fact, a proper plan should be prepared for organising the sports day. After that an administrative or organisation committee should be constituted. This committee conducts all the programme of sports day systematically. Other committees are constituted by this committee for organising the sports day in a smooth and efficient way. The various committees, such as decoration committee, playground committee, programme committee, reception committee, refreshment committee, first aid committee, prize distribution committee, etc., are formed for organising sports day successfully.

## Health Runs

Health runs

Health runs are organised by the health department, sports department or social organisations. Usually, their purpose is to ameliorate the standard of health in a country along with raising funds for charity. Health run is a great physical activity that offers significant health benefits. Health run does not require any specific preparation. For health runs the requirement is only a pair of shoes and light clothes. There is no competition involved but registration of participants is required in advance. The date and time are also fixed well in advance. There is no age limit in health runs and the distance course of running is also fixed. But, before participating in the health runs, everyone should take a note of the following suggestions to make the running experience safe and effective.

1. Avoid tension. Make sure that your arms, shoulders, neck and fingers are relaxed. Hands should be unclenched.
2. Your breathing should be rhythmic and deep. Exhale with controlled force. When you pick up the pace don't let your breathing get shallow.
3. Don't bend your body from the hip level.
4. Run softly and your strides should be normal.

© New Saraswati House (India) Private Limited

5. Your arms should swing equally.
6. Always consume adequate amount of fluid before and after the run, especially in heat.
7. Consult a doctor as a precautionary measure if you are over 60 years old and do not exercise regularly.

## Run for Fun

Run for fun is also organised with an objective to spread the message of remaining healthy and fit among the masses. It may be organised to motivate people to exercise regularly and stay healthy. It is also organised in the same way as the health runs. Run for fun is more related to having fun and frolic during running. In fact, run for fun is a friendly race that involves either road running or cross country running and in which people take part for their own enjoyment and recreation rather than competition.

Run for fun

Generally, run for fun is organised to raise funds for a charity. The sponsors only deduct the organisational expenditures. Run for fun can include novelty such as wearing costumes and defining age categories for children, teenagers and adults.

## Run for a Specific Cause

Run for a specific cause is the run which is related to a good and noble cause. It can be organised for various categories of participants. The distance of the run may vary for different categories of participants. Prizes can be given to the position holders. Its main purpose is to raise funds for specific cause but the cause should be noble. In fact, we all run for different reasons. Generally, the main reason is to stay fit and to have a healthy balance in life. Most of the social non-profit organisations organise marathon races or runs for various noble causes such as for helping the patients of cancer, mentally and physically challenged people and people suffering from arthritis, AIDS, leukemia and so on. For instance, the Mumbai and Chennai marathons are organised for such noble causes. Every year a lot of people including children, adults and old ones take part in such runs and in this way help in raising funds for the needy people.

Running for a specific cause

## Run for Unity

Such a run is organised with a specific purpose, i.e., to consolidate unity and peace among the people of different religions. Its purpose may be national and international integration and brotherhood. In some countries, run for unity is organised to

© New Saraswati House (India) Pvt. Ltd.

celebrate their independence. It may be in the form of relay race of long distance. Every participant runs for some distance. In the form of relay, they feel united. The run may be in the form of a marathon race usually organised in different metro cities for example, Mumbai. A lot of people from the corporate world participate in this race along with film stars and marathon runners from other countries. The cash prize is given to the first three position holders. Such runs promote harmony, peace and solidarity among people of different religions. Such a run brings a sense of togetherness among people.

Run for unity

## EXERCISES

### Objective Type/Multiple Choice Questions (Carrying 1 Mark)

**Fill in the blanks.**

1. ..... means the activities which are performed within the campus of an institution.
2. ..... are also called inter-school competitions.
3. ..... help in building stronger community.

**Choose the correct answer.**

1. Intramurals are significant for:
   (a) Physical development (b) Mental development
   (c) Social development (d) All the above
2. Which sports competition is organised within the school?
   (a) Inter state (b) Extramural (c) Intramural (d) None of these

### Short Answer Type Questions-I (Carrying 2 Marks)

1. Discuss any two objectives of intramural.
2. Discuss the meaning of intramurals and extramurals.
3. What do you mean by "Community" and 'Sports"?
4. How do community sports develop social health?
5. Discuss the procedure for organising school sports day.

### Short Answer Type Questions-II (Carrying 3 Marks)

1. Briefly mention the disadvantages of league tournament.
2. Explain any three objectives of intramurals.
3. Briefly explain any three objectives of extramurals.
4. Briefly explain about any three community sports programmes. *[AI 2020]*
5. Mention the activities that are included in intramurals.
6. Distinguish between Intramural and extramural programmes.
7. Briefly explain the significance of extramural competitions.
8. Discuss in detail about sports day.

© New Saraswati House (India) Private Limited

Or

Explain different steps to be followed for organising a health run in your school. *[AI 2011]*

9. What are community sports programmes? Explain with suitable examples. *[AI 2017]*
10. Write three differences between intramurals and extramurals. *[Delhi 2017]*

**Short Answer Type Questions-III (Carrying 4 Marks)**

1. What do you mean by intramurals? Explain any three objectives of intramurals.
2. What do you mean by community sports? Explain any three benefits of community sports.
3. Discuss any four community sports programmes.

**Long Answer Type Questions (Carrying 5 Marks)**

1. What do you mean by intramurals? Mention the significance of intramurals for school children.
2. What do you mean by extramurals? Elucidate the significance of extramurals.
3. Discuss the objectives of extramurals in detail.
4. What do you mean by community sports programmes? Explain about health runs and run for unity in detail.
5. What do you mean by community sports programmes? Explain any three. *[Delhi 2012]*
6. What do you mean by community sports. Discuss the benefits of community sports for a community.

## Objective Type/Multiple Choice Answers

**Fill in the blanks.**

1. Intramural 2. Extramural competitions 3. Community sports

**Choose the correct answer.**

1. (d) All the above 2. (c) Intramural

# CHAPTER 2 Management of Sporting Events

## 1. EXERCISE GUIDELINES OF WHO FOR DIFFERENT AGE GROUPS

Exercise or physical activity has the potential to improve the physical and mental health of the nation, reduce the maximum causes of mortality and improve life expectancy. Physical activity helps in preventing and managing non-communicable diseases such as heart diseases, stroke, diabetes and several types of cancer. Physical activity also helps in preventing hypertension, maintaining healthy body weight and improving quality of life.

In fact, physical activity is defined as any voluntary bodily movement produced by contraction of skeletal muscles that require energy expenditure. Physical activity

© New Saraswati House (India) Private Limited

can also be defined as any movement of the body that requires energy expenditure. Walking, climbing stairs, gardening, playing any game, dancing, running, swimming and yoga can be considered the best examples of physical activity. According to the department of **Health and Human Services,** "Physical activity generally refers to any movement that enhances health."

At global level, it is estimated that one in four adults and 81% of adolescents do not do enough physical activity. Increased levels of physical inactivity have negative impacts on health systems, the environment, economic development, community well-being and quality of life.

As a matter of fact, regular physical activity is one of the most significant things people can do to improve their health. So, it is always beneficial to move more and sit less, regardless of age, sex, race and current fitness level. That is why it is said that any amount of physical activity is better than none and more is better.

## World Health Organisation Guidelines on Physical Activity/ Exereise

First time, the World Health Organization issued certain guidelines on physical activity/exercise in the year 2010, which were updated and replaced in the year 2020. The World Health Organization guidelines provide details for different age groups on how much, physical activity/exercise is required for good health, however, the guidelines for children over the age of 5 years, adults and older adults are included for the first time. These guidelines are mentioned below according to the different age groups.

### (A) For children under 5 years of age

#### (i) In a 24-hour day, infants (less than 1 year)

1. They should be physically active several times a day in a variety of ways, particularly through interactive floor-based play; more is better. For those infants, who are not yet mobile, they should be kept at least 30 minutes in prone position throughout the day while awake.
2. They should not be restrained for more than one hour in prams/strollers or high chairs, etc. Screen time is not recommended as it is a sedentary activity that consumes very little energy.
3. When sedentary, engaging in reading and storytelling with a caregiver is encouraged, and 14 to 17 hours (0-3 months of age) or 12 to 16 hours (4-11 months of age) of good quality sleep, including naps.

© New Saraswati House (India) Private Limited

### (ii) In a 24-hour day, children (under 1-2 years of age)

1. They should spend at least 180 minutes in a variety of types of physical activity at any intensity, including moderate to vigorous intensity physical activity, spread throughout the day; more is better.
2. They should not be strained for more than one hour at a time in prams / strollers, high chairs or sit for extended periods of time.
   - For 1 year olds, sedentary screen time such as watching T.V. or videos or playing computer games, etc is not recommended.
   - For those aged 2 years, sedentary screen time., should not be more than 1 hour; lesser is better.
3. When sedentary, engaging in reading and storytelling with a caregiver is encouraged.
4. They should get 11-14 hours of good sleep; including naps, with regular sleep and wake-up times.

### (iii) In a 24-hour day, children (3-4 years of age)

1. They should spend at least 180 minutes of variety of types of physical activities at any intensity, of which at least 60 minutes is moderate to vigorous intensity physical activity spread throughout the day; more is better.
2. They should not be restrained for more than 1 hour at a time in prams/ strollers or sit for extended periods of time; less is better.
3. When sedentary, engaging in reading and storytelling with a caregiver; encourage them.
4. They should get 10-13 hours of good quality sleep which may include a nap, with regular sleep and wake-up times.

## (B) Children and adolescents (5–17 years)

1. Children and adolescents should do at least an average of 60 minutes per day of moderate to vigorous intensity, mostly aerobic, physical activity, across the week.
2. They should include vigorous-intensity aerobic activities such as walking, running or playing soccer, as well as those that strengthen muscle and bone, at least 3 days a week. In these activities, climbing, push-ups for strengthening muscles and gymnastics and jumping rope for strengthening bones should be incorporated.
3. They should limit the amount of time spent being sedentary, particularly the amount of recreational screen time.

© New Saraswati House (India) Private Limited

## (C) Adults (18-64 years)

1. Adults should do at least 150–300 minutes of moderate intensity aerobic physical activity or at least 75–150 minutes of vigorous intensity aerobic physical activity; or an equivalent combination of moderate and vigorous-intensity activity throughout the week. Brisk walking should be included in physical activity for substantial benefits.
2. For additional health benefits they should also do muscle-strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week.
3. Adults may increase moderate intensity aerobic physical activity to more than 300 minutes; or more than 150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate and vigorous-intensity activity throughout the week for additional health benefits.
4. They should limit the amount of time spent being sedentary. They should replace their sedentary time with physical activity of any intensity (including light intensity) which provides health benefits.
5. Adults should start by doing small amounts of physical activity and gradually increase the frequency, intensity and duration over time.
6. If adults are not meeting these recommendations, doing some physical activity will also be beneficial for their health, because doing some physical activity is better than doing none.
7. For reducing the detrimental effects of high levels of sedentary behaviour on health, they should aim to do more than recommended levels of moderate to vigorous intensity physical activity.

## (D) Adults (65 years and above)

1. All the older adults should undertake regular physical activity.
2. They should do at least 150 to 300 minutes of moderate intensity aerobic physical activity such as brisk walking or at least 75 to 150 minutes of vigorous intensity aerobic physical activity or on equivalent combination of moderate and vigorous intensity activity throughout the week for substantial health benefits.
3. They should also do muscle strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week as these provide additional health benefits.

© New Saraswati House (India) Private Limited

4. As a part of their weekly physical activity, they should do varied multi component physical activity that emphasizes functional balance (standing on one foot) and strength training at a moderate or greater intensity, on 3 or more days a week to enhance their functional capacity and to prevent falls.
5. They should limit the amount of time spent being sedentary. They should replace their sedentary time with physical activity of any intensity including light intensity that provides health benefits.

**Recommended Levels of Variety of Physical Activity / Exercise for Health Benefits for Adults at a Glance**

| Moderate Intensity Aerobic Activity | Vigorous Intensity Aerobic Activity | Combination of Moderate and Vigorous Intensity Aerobic Activity |
|---|---|---|
| **Examples:** Brisk or fast walking, hiking, cycling or water aerobics, etc., for 150 minutes per week. | **Examples:** Running or jogging, swimming, fast cycling or playing basketball, etc., For 75 minutes per week. | **Examples:** Activity related to moderate intensity or vigorous intensity can be done or a mix of the two each week but keep in mind that minute of vigorous intensity activity is about the same as 2 minutes of moderate intensity activity for 2 or more days per week. |
| **Muscle Strengthening Activities / Exercises**<br>***Examples*** **:** Light weight training, push ups, sit ups, working with resistance bands, yogic exercises, etc., should be included for all the muscle groups, i.e., legs, abdomen, chest, arms, shoulders, hips and back for 2 days per week. | | |

## 3. WOMEN'S PARTICIPATION IN SPORTS – PHYSICAL, PSYCHOLOGICAL AND SOCIAL BENEFITS

The benefits of participation in sports for women are well known. Research studies conducted in this field indicate that sports participation provides important physical, psychological and social benefits to women who take part extensively in the field of sports. The significant benefits such as physical, psychological and social benefits of sports participation for women are described below.

### (A) Physical Benefits

There are a number of physical benefits of sports participation for women. Various research studies show that the women who participate in sports tend to have excellent health than non-participants. They have reduced risk of chronic illnesses later in life such as heart diseases, high blood pressure, diabetes., colon and breast cancers due to stronger immune system. Women who participate in sports and games are less obese then non participants. They have stronger bones and reduced risk of osteoporosis. They have low risk of degenerative diseases associated with ageing. The women, who participate in sports and games, can be easily able to maintain healthy bones, muscles and joints. They are be able to maintain a good neuro-muscular coordination in later life.

© New Saraswati House (India) Private Limited

## (B) Psychological Benefits

Those women, who participate in sports and games are found have improved ability to deal with the pressure. In fact, through participation in sports, they learn to win and lose. They acquire resilience and coping skills for stress. They have higher self -esteem and better self-image. They tend to have more self-confidence. Owing to sports participation, they feel mentally, and emotionally stronger. Sports participation help them in managing stress, tension and worry. They are better at organizing and possess time management skills, which are helpful for success in later life. Research studies indicate that females who participate in sports and games do better in the filed of academics in schools and colleges. Sufficient sports participation is proven to improve learning memory function and concentration which help in better academic performance. Women, who participate in sports are less likely to use drugs and they experience fewer emotional and behavioural problems. They have higher opinions of their abilities and competencies.

## (C) Social Benefits

Women, who participate in sports and games are more socially well-adjusted in society than women who do not participate. By participation in sports, women get opportunities to learn teamwork and sense of belonging. Playing by the rules and overcoming adversity helps women to learn qualities of good sportsmanship and personal responsibility. They also get opportunity to build a new social network. Owing to participation in sports, women are more likely to be involved in community activities in adulthood. Sports participation helps women to cooperate and to be less selfish. It helps them to adjust to new surroundings.

© New Saraswati House (India) Private Limited

## EXERCISES

**Objective Type/Multiple Choice Questions (Carrying 1 Mark)**

**Choose the correct answer.**

1. At global level, it is estimated that one in four adults and ..... percent of adolescents do not do enough physical activity.
   (a) 61 (b) 71 (c) 81 (d) 91
2. .....is also called the rate at which sports activity is being done.
   (a) Frequency (b) Intensity
   (c) Mass (d) Volume
3. Children of 3–4 years of age should spend at least ..... minutes of variety of types of physical activities at any intensity.
   (a) 40 (b) 80 (c) 140 (d) 180
4. Adults should do at least ..... minutes of moderate intensity aerobic physical activity.
   (a) 40 – 80 (b) 100 – 120
   (c) 150 – 300 (d) 300 – 400

**Short Answer Questions-I (Carrying 2 Marks)**

1. Discuss the WHO guidelines on physical activity for children 3 – 4 years of age.

**Short Answer Questions-II (Carrying 3 Marks)**

1. Discuss the WHO guidelines on physical activity for children under 5 years of age.

**Short Answer Questions-III (Carrying 4 Marks)**

1. Elaborate the benefits of sports participation for women.

**Long Answer Questions (Carrying 5 Marks)**

1. Discuss the exercise guidelines of WHO for children under 5 years of age and adults (18-64 years) in detail.
2. Elucidate physical activities/ exercise guidelines of WHO for different age groups.
3. Discuss the physical, social and psychological benefits of sports participation of women in detail.

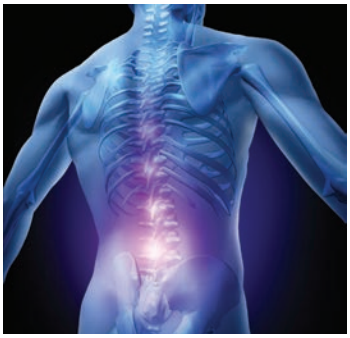
## Objective Type/Multiple Choice Answers

**Choose the correct answer.**

**1.** (c) 81 **2.** (b) Intensity **3.** (d) 180 **4.** (c) 150 – 300

# CHAPTER 3 Yoga

## 5. BACK PAIN AND ARTHRITES: *VAKRASANA, ARDHA CHAKRASANA, BHUJANGASANA, URDHWA HASTOTTANASANA, USTRASANA, GAUMUKHASANA, MAKARASANA, ARDHA/SARALA MATSEYENDRA ASANA, BHADRASANA, NADI SHODHAN PRANAYAMA*



Back Pain

The pain which is felt in the back usually originates from the bones, joints, muscles, nerves, etc. It may be in the cervical, thoracic or lumbar region. It may be spontaneous or can be chronic. It can be constant, affecting one region or radiate to other parts such as arms, hips or legs. It may give a feeling of burning sensation. Sometimes numbness may be felt in the legs or arms. In fact, back pain is not only the problem of our country but it is also prevalent all over the world. As a matter of fact, nine out of ten persons experience back pain at least once in their life. That is why it is said that back pain is a common complaint or problem throughout the world. Due to this problem the affected persons are not able to do their work smoothly and efficiently. Even there are a number of cases when people start absenting themselves from their work. Though it is not a serious problem, it may be painful, especially when it radiates to arms or legs.

Back pain may result owing to bad personal health habits and personal risk factors such as overweight, lack of physical activity or exercise, excessive smoking, lack of

© New Saraswati House (India) Private Limited

flexibility or undue stress on back. Back pain can be prevented as well as cured if the following asanas are performed regularly.

**EXTENSION ACTIVITY**

Have a discussion in the class regarding the following questions related to low back pain:
- What is the most common cause of low back pain?
- How can you diagnose low back pain?
- How does one can get rid of lower back pain fast?
- How does the pain affect one's life?
- Which asanas are beneficial for preventing and curing low back pain?
- What is the proper posture to avoid injuring your back?

## Arthritis

Arthritis is a disease/ disorder which causes swelling and pain in joints such as knee joints, elbow joints, fingers' joints, wrist joints, etc. It makes difficult for joints to move or stay active. It may be due to repeated stress on your joints while playing a game/sports or sitting constantly for a longer period. It may be caused due to viral infections. Your age, lifestyle and obesity may also lead to arthritis.

## Types of Arthritis

There are different types of arthritis but the most common types are mentioned below:

**Osteoarthritis:** It develops when joint cartilages break down from repeated stress. It is the most common type of arthritis.

**Juvenile arthritis:** It is a disorder where the immune system attacks the tissue around the joints.

**Gout:** It is a disorder/disease that causes hard crystals of uric acid to form in your joints. In fact, too much amount of uric acid may lead to gout.

**Rheumatoid arthritis:** It is also a disease/disorder that causes the immune system to attack synovial membranes in your joints. Medications, physiotherapy may help in reducing symptoms and improve quality of life.

**Symptoms:** Different types of joints have different symptoms. They can be mild, moderate or severe. The common symptoms are given below:

(*i*) Stiffness in joints
(*ii*) Pain in joints
(*iii*) Inflammation or swelling in joints
(*iv*) Tenderness
(*v*) Redness
(*vi*) Decreased range of motion difficulty in walking or muscle weakness
(*vii*) Physical deformity

## 1. Tadasana

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.3].

© New Saraswati House (India) Private Limited

## 2. Vakrasana

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.26]

## 3. Bhujangasana

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.12–3.13]

## 4. Ardha Chakrasana

**Procedure:** Stand straight with both feet together. Hold your hips with your hands. Bend backwards without bending your knees with slow inhalation. Remain in this pose for some time. Do it 2 or 3 times.

Ardha Chakrasana

### Benefits

1. It helps to make ankles, thigh, shoulders, chest, spine and abdomen stronger.
2. It relieves stress and tension.
3. It improves digestion.
4. It cures menstrual disorders.
5. It cures pain in legs.
6. It reduces fat in the waist and thigh.
7. It helps to alleviate upper back pain.
8. It relieves stress in the neck and shoulders.

### Contraindications

1. Avoid performing this asana if you have migraine, headache, low blood pressure, diarrhoea and insomnia.
2. Avoid doing this asana if you have peptic ulcer and hernia.
3. Avoid this asana in case of hip or spinal problems.
4. Pregnant women should avoid doing this asana.

## 5. Urdhwa Hastottanasana

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.22–3.23]

## 6. Ustrasana

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.8–3.9]

## 7. Gomukhasana

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.17–3.18]

## 8. Makarasana

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.37]

© New Saraswati House (India) Private Limited

## 9. Ardha/Sarala Matseyendrasana

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.7]

## 10. Bhadrasana

The word "Bhadrasana" is formed by the combination of two Sanskrit words 'Bhadra' and 'Asana'. Here, 'Bhadra' means 'noble, gracious' or 'gentle' 'asana' means 'posture' or 'pose'. This asana helps us in staying beautiful and healthy.

Bhadrasana

**Procedure:** Sit on yoga mat and stretch your legs in front you. Now fold both of your legs and bring them close to each other so that soles of the foot touch each other. Then hold the toes of your feet with hands. After that bring your legs toward perinium, touching the mat. Your spine, neck and head should be straight and both the shoulders should be relaxed. Your breath should be normal and rhythmic. Try to maintain this pose for as long as you feel comfortable.

**Benefits**

1. It helps in improving digestion. It is helpful in giving relief in acidity, gastritis and constipation.
2. It is helpful in getting rid of respiratory problems such as asthma.
3. It strengthens backbone, thighs, hips and buttocks.
4. It is helpful is developing flexibility of legs.
5. It improves focus and concentration.
6. It calms down the mind and reduces mental activity.
7. It is helpful in arthritis.
8. It eases delivery, labour during child birth.
9. It stimulates the spinal nerves, relieves pain in back, sciatica and neck.
10. It activates mooladhara chakra.

**Contraindications**

1. Avoid the practice of this asana if you have severe joint or abdominal pain. However, in normal pain, it is helpful in relieving joint or abdominal pain.
2. Pregnant women should practise it under the expert supervision of a yoga teacher/instructor.

## 11. Nadi Shodhana Pranayama

[Refer to Saraswati Health & Physical Education-XII Section 3 on page 3.38–3.39]

© New Saraswati House (India) Private Limited

# EXERCISES

## Objective Type/Multiple Choice Questions (Carrying 1 Mark)

**Choose the correct answer.**

**1.** Back pain is mainly caused by:
(a) Lack of physical activity (b) Excessive smoking
(c) Lack of flexibility (d) All the above

**2.** Which one of the following asanas should be practised for preventing back pain?
(a) *Tadasana* (b) *Vakrasana* (c) *Ardha Chakrasana* (d) All of these

**3.** Which one of the following is not the type of Arthritis?
(a) Osteoarthritis (b) Juvenile arthritis
(c) Rheumatoid arthritis (d) Cummulative arthritis

**4.** Which of the following asanas is not beneficial in case of backpain and arthritis?
(a) *Tadasana* (b) *Shavasana* (c) *Ustrasana* (d) *Gaumukhasana*

## Short Answer Questions-I (Carrying 2 Marks)

**1.** Discuss the symptoms of arthritis in brief.
**2.** What is back pain?
**3.** What is arthritis?
**4.** What are the causes of back pain?
**5.** Discuss the symptoms of back pain.
**6.** Draw diagram of Bhadrasana and discuss the procedure for performing it accurately.

## Short Answer Questions-II (Carrying 3 Marks)

**1.** What do you mean by Back pain?
**2.** Explain the procedure of Nadi Shodana Pranayama along with the benefits for curing back pain and arthritis.
**3.** What are the possible causes of back pain and arthritis? Discuss.
**4.** Discuss the benefits of Ardha Chakrasana for preventing back pain.

## Short Answer Questions-III (Carrying 4 Marks)

**1.** What do you mean by back pain? Discuss Nadi Shadhana Pranayama for curing backpain and arthritis.

## Long Answer Questions (Carrying 5 Marks)

**1.** What do you mean by Back Pain? Discuss the procedure and benefits of *Nadi Shodhan Pranayama*.
**2.** What are the causes of back pain? Explain the procedure, benefits and contra-indications of any two asanas recommended to cure back pain. *[CBSE 2018, AI 2020]*
**3.** What do you mean by Arthritis. Discuss the procedure of any two asanas for curing arthritis.

## Objective Type/Multiple Choice Answers

**Correct Answer**

**1.** (d) All the above **2.** (d) All of these **3.** (d) Cummulative arthritis **4.** (b) Shavasana

© New Saraswati House (India) Private Limited

## 2. CONCEPT OF CLASSIFICATION AND DIVISIONING IN SPORTS

The main purpose of classification and divisioning in sports is to provide equal and fair competition to the athletes/sportspersons with various types of disabilities. The objective is same to the grouping system used in mainstream sports and games according to the age group, gender and weight categories. The common aim of any type of classification or division in sports of disability is to eliminate or reduce the effect on sports performance owing to age, gender, weight categories or abilities. In fact, classification determines which athletes are eligible to compete in sports and games and how those athletes are grouped for the competition. This process is essential in order to eliminate or minimise the impact of the athletes' disabilities on sports performance. For a clear-cut understanding of "classification" and "divisioning" in the field sports and games, it is essential to know their meanings.

**Classification:** Classification is a process of grouping related to Paralympics and Para-athletes. The classification process provides categories to athletes or sportspersons based on different types of disabilities.

**Divisioning:** Divisioning is a process of grouping related to Special Olympics. It is a performance-based system of grouping of athletes/sports sportspersons. It is based on their level of skill. Special Olympics uses "divisioning" to structure competitions so that athletes compete with other athletes of similar ability in equitable divisions. All these athletes of all ability levels are encouraged to participate in Special Olympics.

### Classification in Paralympics

Paralympics are governed by International Paralympic Committee (IPC). Classification in Paralympics is performed as per the rules and regulations of International Paralympic Committee. The Classification is used to decide which athletes are eligible to compete in each of sports. It aims to create a level playing field by grouping athletes into classes based on their ability to perform a certain activity. Each athlete competing at paralympics goes through an evaluation conducted by officials called "Classifiers". They are appointed by the International Governing Body.

### Process of Classification

It is a long term process which takes place at all major-events, before and during competition. There are various steps which are involved in the process of classification.

**The first step** in the process of classification in Paralympic is to determine whether the athlete has an eligible impairment or not.

© New Saraswati House (India) Private Limited

## Eligible Impairments in Paralympics for Classification

The Paralympic Movement offers sports opportunities for athletes with physical, visual and intellectual impairments. These impairments can be divided into 10 eligible impairment types including physical impairments, visual impairment and intellectual impairment. These impairments must be permanent in nature. There are following Eligible Impairments, which are recognized by International Paralympic Committee (IPC) along with examples of different health conditions that may lead to those impairments.

(*i*) **Impaired muscle power:** Reduced force generated by muscles or muscle groups, may occur in one limb or the lower half of the body. Examples may include spinal cord injury (complete or incomplete) muscular dystrophy, post-polio syndrome and spina bifida.

(*ii*) **Impaired passive range of movement:** Athletes with impaired range of movement have a limitation or restriction or a lack of passive movement in one or more joints. Examples include arthrogryposis or contracture resulting from chronic joint immobilization or trauma affecting a joint.

(*iii*) **Loss of limb or limb deficiency:** Athletes with limb deficiency have total or partial absence of bones or joints as a consequence of trauma (for example, traumatic amputation), illness (for example, amputation due to bone cancer) or congenital limb deficiency (for example, dysmelia).

(*iv*) **Leg-length difference:** Athletes may have a difference in the length of their legs due to a disturbance in limb growth or as a result of trauma.

(*v*) **Short stature:** Athletes with short stature have a reduced length in the bones of the lower limbs and/or trunk. Examples may include achondroplasia, growth hormone dysfunction and osteogenesis imperfecta..

(*vi*) **Hypertonia:** Athletes with hypertonia have abnormal increase in muscle tension and reduced ability of a muscle to stretch caused by damage to the central nervous system. Examples, include cerebral palsy, traumatic brain injury and stroke.

(*vii*) **Ataxia:** Athletes with ataxia have lack of coordination of muscle movements. These are caused by damage to the central nervous system. Examples include: cerebral palsy, traumatic brain-injury, stroke and multiple sclerosis.

(*viii*) **Athetosis:** Athletes with athetosis have continual slow involuntary movements. Examples, include cerebral palsy, traumatic brain injury and stroke.

(*ix*) **Visual impairment:** Athletes with impaired vision have reduced or no vision caused by damage to the eye structure, optical nerve or optical pathways or visual cortex of the brain. Examples include retinitis pigmentosa and diabetic retinopathy.

(*x*) **Intellectual impairment:** Athletes with an intellectual impairment have a restriction or limitation in intellectual functioning and adaptive behaviour which affects conceptual, social and practical adaptive skills required for everyday life. This impairment must be present before the age of 18.

© New Saraswati House (India) Private Limited

The presence of a permanent eligible impairment must be proven by means of medical diagnostic information that must be presented prior to athlete evaluation.

**The second step** is usually a functional assessment which includes two parts: first of all observing an athlete in training and then observing an athlete in competition.

The **third step** is to decide athlete's sports class. In this process,the classification panel assesses which sport class the athlete will compete in. There are various sports classes based on the level of impairment. In athletics, for example, F 11-13 (visual impairment), F 20 (intellectual impairment), F 40–41 (short stature), F 42–44 (leg impairment), F31–34 (wheel chair for athletes with movement disorder) and F 51–57 (wheel chair events with a lower body impairment). The above classification is related to throwing events. T 33–34 and 51–54 is related to wheelchair racing.

## Divisioning in Special Olympics

The unique difference that sets Special Olympics competitions apart from those of other sports competitions is that athletes of all ability levels are encouraged to participate and every athlete is recognized for his/her performance. Competitions are structured so that athletes compete against similar ability athletes in equitable divisions. Indeed, athletes are matched with others of the same gender, about the same age and most significantly of about the same competitive ability.

## Divisioning Process for Special Olympics

The following process is undertaken for divisioning for Special Olympics.

**Step 1 :** Divide athletes by Gender i.e., male and female.

**Step 2 :** Divide athletes by Age. Divide male and female into the following age groups:

| **Individual Sports** | **Team Sports** |
|---|---|
| 8–11 years | 15 and under |
| 12–15 years | 16–21 years |
| 16–21 years | 22 and above |
| 22-29 years | |
| 30 and above | |

**Step 3 :** Divide athletes by their skill ability scores which are recorded by a committee through preliminary and at the site of events.

## 3. CONCEPT OF INCLUSION, ITS NEED AND IMPLEMENTATION

## Concept of Inclusion

The term 'Inclusion' is used in the field of education that is why it is called as Inclusive Education. In fact, it is an approach to educate both normal and students with disabilities or with special educational needs together. Inclusive education means normal students and special needs students learn while sharing the same physical space and interacting socially and academically. It can be stated that in this education differently abled children are educated with normal children within the same roof. It

© New Saraswati House (India) Private Limited

brings all students together in one classroom and community. In inclusive education, students with special needs spend most of their time with non-special needs students. Inclusion completely rejects the use of specific school or classrooms to separate students with disabilities from students without disabilities.

**Inclusion in Sports:** Inclusion in physical education and sports is related to the students with disabilities to participate in all the activities. These students get equal chance to participate in all the activities and they also learn the same curriculum just like other students. It would be the idea of breaking down these barriers, so that all the CWSN have equal chance to take part in programmes of physical education and sports, regardless of disability.

## Need of Inclusive Education

Inclusive education provides perfect training of real life. All students, with or without disabilities, learn to interact and work collectively. Indeed, in India there is a dire need as well as importance of inclusive education. The need and importance of inclusive education are stated below.

1. **For Self Esteem:** Each and every individual has self-esteem. Generally, it may be seen that differently abled individuals are less strong. Research studies conducted in this field indicate that after inclusion in a regular school the students with disabilities have shown improvements in self-confidence. They display qualities of self-efficacy. They develop confidence in their ability to interact with one another and the society in which they live.
2. **For Better Social Skills and Communication:** Inclusive education provides ample opportunities to have better social relations among students with disabilities and without disabilities. As a matter of fact social skills are learnt properly through observation and imitation. Students with disabilities get a better understanding of the world around them. They feel exhilarated about being part of the regular community. A number of case studies show that children with autism demonstrate change in their social behaviour while being with other children without disabilities. Their communication skills are improved a lot.
3. **Greater Sensitivity:** It is usually observed that students without disabilities become more sensitive by learning along with students with special needs. They understand how words can hurt. They practise patience and learn empathy.
4. **For Better Understanding of Strengths and Weaknesses:** Students with or without special needs in inclusive schools learn that each and every individual has strengths as well as weaknesses. They learn to appreciate these differences.
5. **For Better Sense of Belongingness:** Inclusive education is essential for having a better sense of belongingness among students with and without special needs. It teaches the value of another human being—no matter what

© New Saraswati House (India) Private Limited

that person looks or sounds like. Students with special needs enjoy the feeling of belongingness, being loved, having relationship and friendships with students without special needs. Students without special needs also show increased awareness of tolerance and better understanding of other students with special needs.

6. **Higher Academic Achievement:** Inclusive education is beneficial for the students with special needs because research studies conducted in this field show that these students have done academically well than in exclusive education.
7. **For Improvement in Motor Skills:** Inclusion in physical education is needed for improvement in motor skills of students with disabilities. Their movements become efficient and refined. Even level of fitness is also improved up to some extent.

## Implementation of Inclusive Education in India

In India, the number of children/persons with disabilities or special needs is really large. They have a number of problems in getting education especially inclusive education. Now, it is important that inclusive education is implemented in India so that the benefits are enjoyed by all individuals. We know that there were many great scientists like Thomas Alva Edison, Albert Einstein and Graham Bell who had learning disabilities. Considering the benefits that we could derive by educating children with special needs along with children without disabilities in inclusive education, Government of India should propose pointers that can build a strong as well as effective education system in the country. Government of India should emphasize on the following measures for effective implementation of inclusive education.

1. The Right to Education is to be made effective in all states so that every child receives education and through inclusion, addressing children with special needs is also taken care of.
2. Teachers, especially in rural areas, are to be trained well so they are equipped with the required knowledge to teach children with special needs in an inclusive system of education. Workshops to be conducted to keep them abreast of the recent developments in inclusive education.
3. Regular analysis of schools, curriculum and amenities are to be done to develop a support team to give access to the regular curriculum methods to children with difficulties in learning. This is possible with a flexible approach whereby teachers and students are able to rectify the problems that they face during the teaching-learning process.
4. Parents should be taken as a resource and be involved in decision-making process to enhance their child's learning. They are to be made partners in the education so that a collaborated effort would result in effective inclusive education.

© New Saraswati House (India) Private Limited

5. For proper implementation of inclusive education in schools the differently abled students should be treated equally as normal students. In fact, the differently abled students should not be looked at sympathetically. They should be recognised by their talents, capabilities and abilities.
6. To enroll children with special needs in regular schools requires a lot of adjustments in terms of classrooms, transport facilities and educational materials. Materials should be provided based on the needs of the students so that they are able to learn along with their regular peers. These include books, stationery, assisstive devices, audio textbooks or Braille textbooks, etc.
7. A suitable examination system and periodic evaluation of children with special needs to be in place to meet the challenges and changing trends in special education. Curriculum experts should carefully design programmes so that curriculum is made parallel for all the children with or without special needs in inclusive education.
8. Sincere efforts should be made to develop good relations between families of students with disabilities and without disabilities. In this way, both types of students i.e., with or without disabilities will also develop good relations among themselves. It will be helpful in creating an appropriate environment for implementing inclusive education.
9. For proper implementation of inclusive education, students related materials like uniforms, books, stationery, transport allowance, stipend for girls, boarding and lodging facilities, therapeutic services, teaching and learning materials, assistive devices, etc., should be provided to students with special needs by the schools.
10. Inclusive education should be flexible. The flexibility in this field should be reflected in the teaching methods and materials provided to the students with disabilities.
11. A school should form a support team to develop strategies for the whole school to meet the requirements of students with special educational needs.

In conclusion it can be said that the Government as well as the school teachers should lay due stress on the above-mentioned measures for effective implementation of inclusive education.

© New Saraswati House (India) Private Limited

## EXERCISES

### Objective Type/Multiple Choice Questions (Carrying 1 Mark)

**State True or False.**

2. Inclusive education provides perfect training of real life. (True/False)

**Choose the correct answer.**

1. Which one of the following is not the age group for team sports in Special Olympics?
   (a) 8–11 years (b) 15 and under
   (c) 16–21 years (d) 22 and above

2. F 11–13, Sports class in Para-athletics is related to:
   (a) Visual impairment (b) Leg impairment
   (c) Limb deficiency (d) Intellectual impairment

**Short Answer Questions-I (Carrying 2 Marks)**

1. What do you mean by Classification and Divisioning in sports?
2. Discuss any two eligible impairments in Paralympics for classification.
3. Briefly mention divisioning process for Special Olympics.
4. How does inclusion in sports help to improve communication skills of students?

**Short Answer Questions-II (Carrying 3 Marks)**

1. What do you mean by inclusion in education?
2. Briefly discuss the implementation of inclusive education in India.

**Short Answer Questions-III (Carrying 4 Marks)**

1. Mention four benefits of inclusive education.
2. Discuss the benefits of inclusive education for CWSN.
3. What is inclusion is sports? Is there any need of inclusion in physical education? Justify in brief.

**Long Answer Questions (Carrying 5 Marks)**

1. What is inclusion? Discuss the need of inclusive education.
2. How can inclusive education be implemented in India effectively? Explain.
3. How does inclusion in Physical education provide benefits to CWSN?

## Objective Type/Multiple Choice Answers

**State True or False**

**1.** True

**Correct Answer**

**1.** (a) 8–11 years **2.** (a) Visual impairment

# CHAPTER 5 Sports & Nutrition

## 4. EATING FOR WEIGHT CONTROL—A HEALTHY WEIGHT, THE PITFALLS OF DIETING, FOOD INTOLERANCE AND FOOD MYTHS

### Meaning of Healthy Weight

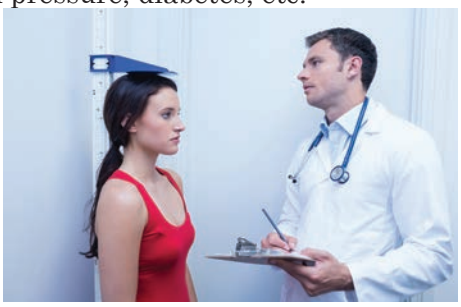
Usually an individual who has healthy weight leads a healthy life with a reduced risk of diseases. It means that if an individual has a healthy weight, he can lead a healthy life. On the other hand, if an individual has an unhealthy weight be it underweight or overweight, he/she is not able to lead a healthy life.

According to **National Institute of Health**, "*A healthy weight is considered to be the one that is between 19 and 25 (BMI). If the BMI is between 25 and 29 an adult is*

© New Saraswati House (India) Private Limited

*considered overweight. If the BMI is 30 or greater, the person is considered to be obese.*"

In simple words, it can also be said that a healthy weight is that weight which lowers an individual's risk for various health problems such as heart diseases, stroke, high blood pressure, diabetes, etc.



Measurement of height

Measurement of weight

There are usually two popular methods to find out or calculate the healthy weight, i.e., height and weight chart and body mass index chart (BMI chart). Height and weight chart tells us about healthy body weight, whereas another method is based on BMI using which one can come to know whether one has healthy body weight or not.

### 1. Method to know healthy weight through height and weight chart

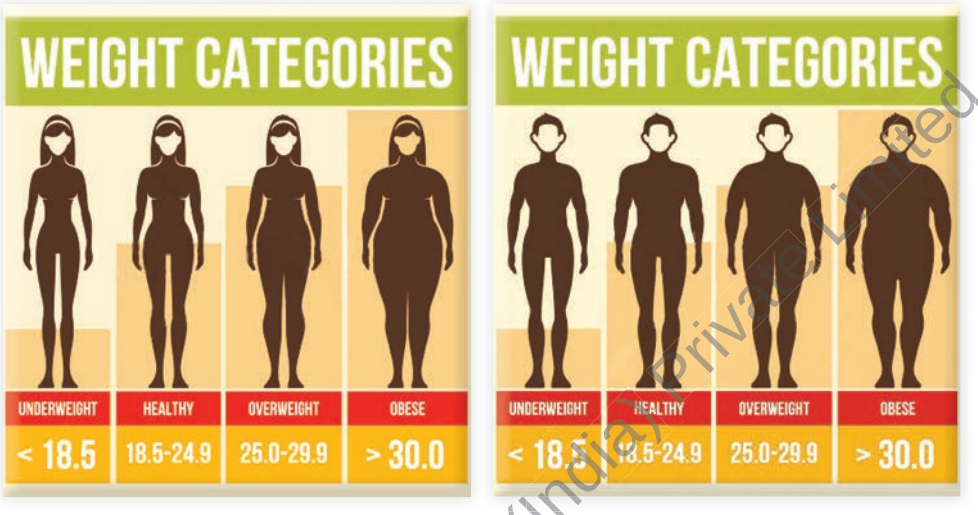
**Chart of Height and Weight**

| Male | | | | Female | | | |
|---|---|---|---|---|---|---|---|
| Height in cm | Low Weight (kg) | Medium Weight (kg) | Maximum Weight (kg) | Height in cm | Low Weight (kg) | Medium Weight (kg) | Maximum Weight (kg) |
| 157.5 | 50.7–54.4 | 53.7–57.1 | 57.1–63.9 | 147.5 | 41.7– 44.4 | 43.5–48.5 | 47.1–53.9 |
| 160 | 52.1–55.8 | 54.8–60.3 | 58.5–65.3 | 150 | 42.6–45.8 | 44.4–49.9 | 48.0–55.3 |
| 162.5 | 53.5–57.1 | 56.2–61.6 | 59.8–67.1 | 152.5 | 43.5–47.1 | 45.8–51.2 | 49.4–56.7 |
| 165 | 54.8–58.5 | 57.8–63.0 | 61.2–68.9 | 155 | 44.9–48.5 | 47.1–52.6 | 50.8–58.0 |
| 167.5 | 56.2–60.3 | 59.0–64.8 | 62.6–70.0 | 157.5 | 46.2–49.9 | 48.5–53.9 | 52.1–59.4 |
| 170 | 58.0–62.1 | 60.7–66.6 | 64.4–73.0 | 160 | 47.6–51.2 | 49.9–55.3 | 53.5–60.7 |
| 172.5 | 59.8–63.9 | 62.6–68.9 | 66.6–75.2 | 162.5 | 49.0–52.6 | 51.2–57.1 | 54.9–62.6 |
| 175 | 61.6–63.7 | 64.4–70.7 | 68.4–77.1 | 165 | 50.3–53.9 | 52.6–58.9 | 56.7–64.4 |
| 178 | 63.4–68.0 | 66.6–72.5 | 70.3–78.9 | 167.5 | 51.6–55.8 | 54.4–61.2 | 58.5–66.2 |
| 180 | 65.3–69.8 | 68.0–74.8 | 72.1–81.1 | 170 | 53.5–57.6 | 56.2–63.0 | 60.3–68.0 |
| 183 | 67.1–71.6 | 69.8–77.1 | 75.3–83.4 | 172.5 | 54.8–59.4 | 58.0–64.8 | 62.1–69.8 |
| 185.5 | 68.9–73.4 | 71.6–79.3 | 76.1–85.7 | 175 | 57.1–61.2 | 59.8–66.6 | 63.9–71.6 |
| 188 | 70.7–75.7 | 73.4–81.6 | 78.4–87.9 | 178 | 58.9–63.5 | 61.6–68.4 | 65.7–73.9 |
| 190.5 | 72.5–77.5 | 75.7–83.9 | 80.7–90.2 | 180 | 60.7–65.3 | 63.5–70.3 | 67.5–6.2 |
| 193 | 74.3–79.3 | 78.0–86.1 | 82.5–92.5 | 183 | 62.6–67.1 | 65.3–72.1 | 69.4–78.4 |

© New Saraswati House (India) Private Limited

2. **Method to Calculate BMI.** If you want to know your body mass index, then divide your body weight in kg by your height in metre square, viz.,

$$\text{Body Mass Index} = \frac{\text{Weight in kg}}{\text{Height in m}^2} \quad \text{or} \quad = \frac{\text{Weight}}{\text{Height} \times \text{Height}}$$




Healthy BMI for both women and men

The WHO criteria for underweight, healthy or normal weight, overweight and obesity by BMI are as follows:

| Category | BMI |
|---|---|
| Underweight | < 18.5 |
| Normal weight | 18.5 – 24.9 |
| Overweight | 25 – 29.9 |
| Obesity Class I | 30 – 34.9 |
| Obesity Class II | 35 – 39.9 |
| Obesity Class III | > 40 |

So, you can understand your weight category by having a glance at these criteria.

## Methods to Control Healthy Body Weight

Stress should be laid on the following points for proper methods to control healthy body weight.

1. **Set an Appropriate Goal:** For losing body weight, you should set an appropriate goal, i.e., how much weight you want to shed or lose. While setting the goal, you should know about your capacities and limitations. Your goal should be achievable. You may set your goal for one month. Take a pledge that

© New Saraswati House (India) Private Limited

you will lose 1 kg per month depending on how much excess weight you have. After that you can further set your goal for weight control.

2. **Lay Stress on Health Not on Weight:** It is a well-known fact that losing weight for health rather than appearance can make it easier to set reasonable goals. From the point of view of health, you should make efforts to achieve or maintain a body mass index between the range of 18.5 and 24.9. If your BMI or waist measures beyond these limits you may be at a risk of contracting various diseases. So, from the point of view of health try to maintain these limits.
3. **Cut Your Calories:** Keep a plan ready to get back on the track if your body weight begins to exceed the required level. It is a simple plan to follow. Just cut or subtract only 100 calories a day. In this way, you can return to your set goal.
4. **Active Lifestyle:** An active dynamic lifestyle plays a pertinent role in controlling weight. School children should prefer to walk to school instead of going by car or motorbike. Instead of elevators, they should take stairs. If they want to switch off the TV, they should not use a remote control but should do this physically. They should not watch TV for more hours. Instead of watching TV for more hours they should play outdoor games. In this way, they can lead an active lifestyle, which will be beneficial in their weight control.
5. **Bring Out Support:** No doubt, you can lose or maintain your weight without anybody's support, but if you get support from other people it makes the process of losing weight easier and more pleasant. Tell people who are close to you about your intention that you are serious and committed to losing weight. Tell them that you would appreciate their support. In fact, having a support of a partner really works wonders for many persons. Promising to meet a partner for the regularly scheduled gym time is a great way to stick to a workout routine. Such type of support can be sought for lifetime. It will help you in maintaining your weight.
6. **Yogic Exercises:** Yogic exercises can help in controlling as well as maintaining proper weight. For example, pranayama and yogic asanas, are helpful in controlling weight. As a matter of fact, research studies have proved that stress and tension tend to increase weight. Meditative asanas are beneficial in relieving stress and tension. Therefore, yogic exercises can also be used for keeping a good control on weight.
7. **Avoid Fatty Foods:** If you want to lose or maintain weight, you should avoid fatty foods in your diet. Fats are known to have maximum number of calories. These extra calories will be accumulated in your body. So avoid fatty foods, if you want to remain healthy.
8. **Avoid Junk and Fast Foods:** Try to avoid junk and fast foods such as pizza, burger, chips, cookies, pastry, chocolate, cold drinks, etc., if you want

© New Saraswati House (India) Private Limited

to lose weight. These foodstuffs are also rich in empty calories. Intake of such foodstuffs leads to the condition of overweight.

9. **Avoid Overeating:** To control or maintain weight, you should not overeat. It means that you should eat food as per the requirement of your body. Suppose, you require 2,000 calories per day, then you should take the food that consists of only 2,000 calories. If you take 2,100 calories per day, the 100 calories will be accumulated daily as fat in your body. So, you should avoid overeating.
10. **Don't Eat Smaller Meals Frequently:** You should not form a habit of eating smaller meals frequently. So, avoid eating smaller meals frequently to avoid adding excess fat to the body.
11. **Avoid Rich Carbohydrate Food:** To lose weight, avoid rich carbohydrate foods. But it does not mean that you should not take carbohydrates at all. Carbohydrate is necessary to increase the level of energy. So, you should just reduce the amount of carbohydrate in your diet. For this purpose try to avoid sugar, rice, potatoes, toffees, chocolates and other sweets.
12. **Don't Skip Meals:** Don't skip your meals, such as breakfast, lunch and dinner. If you skip your meal, the next time you will definitely indulge in overeating which may lead to obesity. In fact, skipping meals increases hunger and it results in greater food consumption in the next meal that you take.
13. **Regular Exercise or Physical Activity:** Exercise helps to control your weight by using up excess calories. On the other hand, if you do not exercise, the excess calories will be stored as fat. In fact, your body weight is regulated by the number of calories you take in and use each day. In reality, whatever you eat, contains calories and whatever you do, uses calories. Even calories are used while breathing, sleeping and digesting food. Regular exercise or physical activity is a vital part of weight loss or weight control programme for lifetime. Research studies consistently indicate that regular physical activity/ exercise such as aerobic exercise and strengthening exercise for at least 30 minutes, combined with healthy eating habits, is the healthiest way to control weight for a lifetime. Whether you are making endeavours to lose weight or maintain it, you should never forget the significant role of exercise/physical activity.
14. **Balancing the Intake of Calories and Expenditure of Calories:** For maintaining a healthy weight, you should always try to strike a balance between your intake of calories and expenditure of calories. For implementing this, try not to eat more calories than your body burns each day. Always stick to your eating plan even on a holiday or a function. If your intake of calories is more than what you need, the excess calories are stored as fat. Too much stored fat raises your BMI and makes it hard to return to your aimed weight. Lay stress on the following points for balancing the intake and burning of calories.

© New Saraswati House (India) Private Limited

(*a*) When you take more calories than you require to do your day's activities, your body stores the extra calories and as a result of this you gain weight.

(*b*) When you take less number of calories than your expenditure of calories, you lose weight.

(*c*) When your intake and expenditure of calories remain same, your body weight also remains the same.

By laying stress on the above-mentioned points, a healthy body weight can be achieved. It is usually said that you may lose your body weight for short period but it is difficult to maintain it for a lifetime. Indeed, it requires a strong willpower, dedication, firm determination, persistent endeavours and motivation to control weight and maintain a healthy weight.

## The Pitfalls of Dieting

Food intolerance

Nowadays everybody wants to remain slim and trim. People who are overweight use various methods to lose weight. Most of them adhere to dieting. In the beginning, dieting produces good results or success. But after initial success it adds more weight later on. Even research studies indicate that 90% of the dieters gain all of their weight back and sometime more than that. In fact, we are all aware that shedding or losing weight is not as simple as it sounds. Eat less and exercise more to burn calories. We know this scientific fact but it is difficult to implement. In fact, there are some pitfalls/dangers of dieting that keep us away from losing or reducing weight. The major pitfalls of dieting are stated below.

1. **Extreme Reduction of Calories:** For dieting, intake of calories is reduced extremely. Research studies indicate that 1800 calories a day cannot meet all the nutritional requirements of an individual. If you reduce intake of calories it will result in a huge loss of weight. It can be dangerous for you. It will definitely lower your metabolism and as a result of this your body weight will not be reduced in a healthy manner.
2. **Restriction on Some Nutrients:** Generally some nutrients like carbohydrates and fats are restricted in dieting. In reality, your body needs all types of nutrients. If you don't take all the nutrients in required amounts, the proper functioning of the body will be impaired.
3. **Skipping Meals:** It is a fact that if you have good metabolic rate, you can maintain or lose weight. If your metabolic rate is slow you gain weight very

© New Saraswati House (India) Private Limited

easily. So, if you skip meals, it will lower your metabolism to conserve energy. So, skipping meals works against your weight-loss plans. Research studies also show if you skip one meal, you take more calories during the next meal.

4. **Intake of Calories through Beverages:** If you want to lose your weight, most probably, you lay stress on not to eat more and not on what you drink. In fact, beverages, coffee with cream and sugar, sweetened juices and sodas really contribute to weight gain.
5. **Underestimating the Calories:** It is a fact that most of the persons who go on dieting usually underestimate the number of calories they consume. So, it is essential to be more aware of the amount of calories you take in your diet.
6. **Intake of Labelled Foods:** Most of the persons who go on dieting usually go for such food products that carry the label 'lean', 'sugar free', 'low calories' or 'no fat or fat-free'. Such type of food is not always the best for losing weight. In addition, it does not meet all the nutrient requirements of your body. As a matter of fact, three chocolate biscuits contain 140 calories whereas three non-fat cookies contain 120 calories. This difference is insignificant. Apart from this, when you eat such products you think that these products have very few calories and so you tend to eat more, as a result of which, you end up consuming more calories.
7. **Not Exercising:** If you go on dieting and do not exercise, it will work against the weight-loss programme. Instead of losing weight you are likely to gain weight. As a matter of fact, exercise has a positive effect on metabolism and also helps to burn some extra calories. Exercise increases metabolic rate which ultimately reduces body weight. So, dieting is beneficial only if you exercise alongside.

## Food Intolerance

Food intolerance is more common than food allergy. Food intolerance is a term used widely for varied physiological responses associated with a particular food. In simple words, food intolerance means the individual elements of certain foods that cannot be properly processed and absorbed by our digestive system. Some persons can tolerate a reasonable amount of the food but if they eat too much or too often they get symptoms of food intolerance because their body cannot tolerate unlimited amounts. Food intolerance comes on gradually not frequently. It is not life threatening.

### Causes of Food Intolerance

Food intolerance is caused by part or complete absence of activity of the enzymes responsible for breaking down or absorbing the food elements. These deficiencies are usually innate. Sometimes food intolerance can be diet-related or can be due to illness.

### Symptoms

Food intolerance can cause nausea, stomach pain, diarrhoea, vomiting, flatulence, gas, cramps, heartburn, headaches, irritability, nervousness, etc.

© New Saraswati House (India) Private Limited

### Management of Food Intolerance

Individuals can try minor changes of diet to exclude food causing adverse reactions. Sometimes it can be managed adequately in such a way without the need for professional assistance. If you are unable to know the food which causes problem you should seek expert medical help. Guidance can also be provided by your general practitioner to assist in diagnosis and management. For managing food intolerance, fructose intolerance therapy, lactose intolerance therapy and histamine intolerance therapy can be applied.

## Food Myths

There are various food myths which are prevailing not only in India but all over the world. What to eat, when to eat and how often to eat are such questions which usually confuse most of the individuals. We believe in such myths because they sound like they could be true. Nowadays, we have scientific knowledge and on the basis of that knowledge we should not believe in food myths. The most common food myths which are still prevalent in our contemporary society are stated subsequently.

1. **Potatoes Make You Fat:** Earlier, people used to think that carbohydrate-rich foods such as rice, potato, etc., increase body weight. So, for losing or reducing weight they used to eliminate carbohydrate-rich foods from the diet. Now, we know that carbohydrates are the body's preferred energy source. Potatoes do not automatically make you fat. So, there is no problem in taking potatoes in moderate quantity.
2. **Fat-free Products Will Help You in Losing Weight:** Fat-free labelled products can lead to weight gain, In fact, these foods have more calories. Approximately, these products have the same number of calories (may be slightly less) in comparison to other regular food. In addition, most of the persons eat more quantity of labelled food under the misconception that it comprises less calories. However, they ultimately consume more calories which can cause weight gain.
3. **Eggs Increase Cholesterol Levels So Avoid Them:** Eggs are, undoubtedly good source of health. An egg provides you various nutrients such as protein, vitamins A, B, D, zinc, iron, calcium, phosphorus, etc. It also fulfils the daily requirement of cholesterol by our body. So, taking one egg daily causes no problem in the level of cholesterol.
4. **Drinking While Eating Makes You Fat:** The actual fact behind this misconception is that enzymes and their digestive juices will be diluted by drinking water while eating. It will slow down your digestion which may lead to excess body fat. In contrary, there is a scientific fact that drinking water while eating improves digestion.
5. **Don't Take Milk Immediately After Eating Fish:** Many people believe that you should not take milk immediately after eating fish. They think that it will

© New Saraswati House (India) Private Limited

make you sick. Some people even think that spots can appear on your skin if you consume milk after eating fish. As a matter of fact, there is no scientific reason in taking milk immediately after eating fish. Indeed, these products may be taken together.

6. **Starve Yourself If You Want to Lose Weight:** Eating a good diet is more important than not to eat when you are on a weight-loss programme. Include such food items in your diet which suppress appetite and increase metabolism so that you don't eat too much. So, there is no need to starve yourself if you want to lose weight.
7. **Exercise Makes You Eat More:** Exercise burns calories which may increase your hunger. Research studies conducted in this area have not shown that the individuals who do exercise, consume more calories than those who don't exercise. So, there is no truth in this statement.

## 5. IMPORTANCE OF DIET IN SPORTS AND PRE, DURING AND POST REQUIREMENT

### Important of Diet in Sports

Diet and sports performance

Any diet which has all the constituents of food in sufficient amount, necessary for the maintenance and growth of body is essential for all the individuals whether they do simple work or engage in highly competitive sports. The requirement of diet varies a lot from one individual to another that to fix a standard diet for a group of persons would be meaningless. Generally, the daily requirement for an active person may vary from 3000 calories to 8000 calories, depending upon his/her size, weight, age, physical condition and the severity of the work done on each day.

Various claims have been made to ascertain the role of diet on the performance of sportspersons. Many researchers who have investigated the role of diet on sports performance say that a well-balanced diet is essential to ensure good performance. Some studies indicate that diet can improve sports performance, whereas some studies do not claim any significant effect of diet on sports performance. A number of studies indicate that a particular diet can improve the sports performance. As a matter of fact, a well-balanced diet may not guarantee success in sports but it is a given fact that imbalanced diet definitely affects the performance adversely, whether in sports or in other type of work. To know the role of a particular diet, it would be better to know the role of essential nutrients on performance. These essential nutrients are described below.

© New Saraswati House (India) Private Limited

## Fat

Fat is considered as a major source of fuel for light to moderate levels of activity. Various types of sports require different proportions of fat to muscles to maximise performance. A minimum amount of fat is desirable for a distance runner, high jumper and a gymnast. These athletes require nominal fat. Adding weight to their body will hinder their performance. Distance swimmers need a certain amount of fat distributed near the skin surface to diminish the heat loss to the water.

Research studies show that extra weight of fat that has to be carried by a runner definitely diminishes the performance.

## Carbohydrate

Carbohydrate is also a major fuel for muscular contraction. Research studies suggest that carbohydrate is helpful in increasing the endurance of sportspersons. Carbohydrate should not be given to athletes in excessive amount. It may be risky for them. Again, a low level of carbohydrate usually results in exhaustion. Balance is the key.

## Protein

Protein is necessary for the growth and development of various tissues of the body. Now, it has been understood that some amount of protein is consumed as fuel for muscular work. If fat and carbohydrate are available, then they are chosen preferentially over protein as the source of energy.

The results of various studies have shown that work performance is neither improved nor decreased by protein supplementation or deprivation. Recent studies suggest that protein helps in the growth of lean tissues but does not have any significant effect on performance.

## Vitamins

Vitamins are essential in the normal diet for good performance in work and sports but there is no clear evidence that extra amount of vitamins improves the performance. In fact, the body cannot store a large amount of vitamins; most of the excess amount of vitamins is excreted through the urine. So, an excess of vitamins only gives extra work to the excretory organs. There are only three vitamins which have received the attention of researchers. These are:

1. **Vitamin C:** Low level of vitamin C intake does not reduce the work performance significantly. Approximately, 60 mg of vitamin C intake by non-athletes and 300 mg to 500 mg intake by successful athletes do not have any harmful effect on kidneys.
2. **Vitamin E:** Vitamin E has been claimed to have beneficial effects in the treatment of many diseases and especially heart diseases. Several studies conducted on the use of Vitamin E have shown little or no effect on the performance. It has been established that excess amount of Vitamin E intake does not improve the performance in sports.
3. **Vitamin B-complex:** Deficiency of vitamin B-complex has shown decrease in the sports performance. Several studies related to excess amount of vitamin

© New Saraswati House (India) Private Limited

B-complex intake show both improvement in performance and no influence on performance. In fact, there is a need of further research and studies to establish the effect of this vitamin on the performance of athletes.

## Minerals

It is a well-known fact about minerals that their deficiency can decrease the performance, especially during the exercise in hot climate. Sweating reduces the amount of sodium and chloride in the body. Excess amount of salt intake can lead to potassium loss and increased water retention. This condition can be harmful for the persons with hypertension. Still, there is no clear indication by research studies that an excess amount of intake of minerals improves the performance of athletes.

## Water

Water is essential for life. The deficiency of water in the body has shown decreased performance. There can be the risk of central nervous system disorders. On the other hand, the excess amount of water intake does not have any improvement in sports performance because it has no calorific value.

It can be concluded that there is a significant effect of diet on sports performance. Successful sportspersons also require a well balanced diet to display a good performance in sports. Hence, a well-balanced diet is essential for every sportsperson.

Sports nutrition

**Importance of Diet in Sports at a Glance**

(*i*) Diet provides sufficient energy during training and competition.
(*ii*) Diet provides proper nutrition to repair cells and decreases tiredness.
(*iii*) Provides energy to improve sports performance.
(*iv*) Helps in maintaining appropriate body weight.
(*v*) Diet provides sufficient amount of fluids beneficial to improve hydration.
(*vi*) Helps in recovery process.
(*vii*) Helps in improving health and immune function.
(*viii*) Diet reduces the potential for injuries in sports.

## Intake of Nutrition Before, During and After the Competition or Training

Most of the sportspersons are concerned about what to eat before, during and after the competition or training because intake of nutrition plays a very significant role

© New Saraswati House (India) Private Limited

in enhancing the performance in sports and games. However, it is also a fact that optimal health and sports performance are achieved by having proper diet every day and not just the day before, during and after the competition or training. It is also essential to take a variety of foods daily in order to consume all the nutrients needed for good health and maximum performance. Intake of such nutrients cannot be ignored. The explanation of the intake nutrition (fluid and meal) before, during and after the competition or training is stated below.

### Nutrition Before the Competition

What a sportsperson consumes before a competition or training is really very important for a good sports performance. As a matter of fact, at least a week before competition, an athlete/sportsperson should take complex carbohydrate foods which usually help in enhancing the glycogen stores. **Miller** suggests that 500–600 g per day may make muscles store over 20 per cent more glycogen. The fuel for muscles is usually provided in the meals at least 3–4 days prior to competition. Therefore, it is very important to take a high energy meal not only on the day of competition, but also several days before. In fact, the intake of nutrition also depends on the intensity and type of activity being performed. Glucose is usually preferred as the best energy source, especially for the activity of high intensity.

So, before competition, the diet or meal should be rich in carbohydrate and low in fat, protein and fibre. Such type of diet may include bread, cereals, potatoes, pasta, rice, fruits and vegetables for quick energy. The day before competition, the meals should consist of rich carbohydrate such as pasta, toast bread, brown rice or whole grains, etc. High fat and protein should be avoided because they slow down digestion. Approximately, two hours before the competition, a high carbohydrate/energy drink can be considered sufficient. Taking fluid helps in preventing dehydration during competition. In fact, a little dehydration may cause poor performance. Just before the competition, a sportsperson should not feel hungry. He/she should be properly hydrated.

### Nutrition During the Competition

Nutrition during the competition is essential to stay hydrated and to maintain blood sugar levels so that sportsperson may not undergo fatigue. So, a sportsperson should frequently take fluids during competition. In fact, staying hydrated is the most significant factor for maintaining performance during competition. He/she should not wait to feel thirsty. In fact, the amount of fluid intake depends on the climate and the intensity of the competition. If the duration of the competition is more than 60 minutes, a sportsperson should take small amount of carbohydrate at a regular interval during competition. In this way, the blood sugar level will be enhanced and glycogen stores will not be depleted rapidly. Half cup to one cup of fluid after every 10–20 minutes during the competition is better. If the duration of competition is more than one hour, one should take small snack after a short break. If the duration of the competition is less than 60 minutes, a sportsperson should drink water frequently after every 10–20 minutes.

© New Saraswati House (India) Private Limited

All the events do not require extra energy during competition. Indeed, a number of research studies have shown that sports drinks may be beneficial during high intensity level activities lasting 60 minutes or longer or less intensity level activities lasting for prolonged periods of time.

### Nutrition After the Competition

Nutrition after the competition is essential for proper recovery. Such nutrition is extremely important, as it will determine the recovery and energy level of the sportsperson for the next day's competition. First of all the preference should be given to replacement of any fluid loss. This can be easily done by the intake of water or fluid replacement drink. It is equally significant to take some carbohydrate immediately within 15 minutes after competition to start restoring glycogen. For this purpose fruits, juices and sports drinks may be included. High carbohydrate drinks may be used. Meals after the competition should be taken within two hours of the competition for the best glycogen restoration. About 100–200 g carbohydrate along with lean protein like meat or chicken should be taken. Intake of protein with carbohydrate after competition will definitely help in building, maintaining and repairing muscles. At least 20 g of protein is required after competition to enhance muscle recovery. It can be derived from the food like cheese, egg, milk, yoghurt, etc.

After two hours of competition, a sportsperson should take a complete balanced meal. In this meal, carbohydrate in the form of grains, rice, potatoes, cereals and vegetables and fruit and protein in the form of meat, fish, soyabeans, bread, peas and egg should be included. Various studies have shown that intake of carbohydrate approximately 2 g per kg of body weight and 40 g of protein within 2 hours after competition speed up the replenishment of glycogen stores and recovery time.

© New Saraswati House (India) Private Limited

## EXERCISES

### Objective Type/Multiple Choice Questions (Carrying 1 Mark)

**Choose the correct answer.**

1. BMI between 25.0–29.0 is:
   (a) under weight (b) normal (c) over weight (d) obese
2. Healthy body weight helps in lowering this disease.
   (a) Risk of heart disease (b) Diabetes
   (c) High blood pressure (d) All of the above
3. What is the full form of BMI?
   (a) Body Measurement Index (b) Body Minimum Index
   (c) Body Mass Index (d) Body Mass Indication
4. BMI value is denoted as:
   (a) $kg/m^2$ (b) $cm/m^2$ (c) $mm/m^2$ (d) $m/m^2$
5. ..... refers to inability to digest a particular kind of food.
   (a) Food myths (b) Food intolerance (c) Food tolerance (d) Healthy food

### Short Answer Questions-I (Carrying 2 Marks)

1. What do you mean by healthy weight? Discuss in brief.
2. How can you keep your healthy weight by eating? Discuss any two method.
3. Discuss any two pitfalls of dieting. *[AI 2020]*
4. Discuss the management of food intolerance.
5. Discuss any two food myths.
6. What is the importance of diet in sports?
7. Discuss the importance of protein in terms of sportspersons.
8. Mention the signs and symptoms of food intolerance..

### Short Answer Questions-II (Carrying 3 Marks)

1. Briefly explain any three food myths.
2. Discuss any four pitfalls of dieting.
3. Discuss the causes and management of food intolerance.
4. What do you mean by food myths? Briefly explain about four myths.
5. In sports such as Boxing and Wrestling, do players tend to lose weight sharply? Explain the pitfalls of dieting. *[CBSE Sample Paper 2015]*
6. What type of nutrition would you take before taking part in competition? Explain in brief.
7. Briefly mention about nutrition during competition.
8. Discuss in brief about nutrition after competition.

### Short Answer Questions-III (Carrying 4 Marks)

1. Discuss the importance of diet in detail.
2. Elaborate the intake of food during and after the competition.
3. What are food myths? Discuss any four food myths.
4. Enlist the methods for keeping healthy body weight and discuss any three of them.
5. Write a brief note an eating for weight control.

### Long Answer Questions (Carrying 5 Marks)

1. Discuss the role of nutrition on the performance of a sportsperson.
2. "Diet or nutrition can enhance the performance of a sportsperson". Give your comments about this statement in detail.
3. What do you mean by healthy weight? Discuss about the methods to control healthy body weight for lifetime.
4. Elucidate about the various pitfalls of dieting in detail.
5. What do you mean by food intolerance? Explain the causes, symptoms and management of food intolerance in detail.
6. What do you mean by food myths? Explain any six food myths prevailing in contemporary society.
7. Diet or nutrition for sportspersons is important. What should be the aims of preparing diet for sportsperson?
8. What do you mean by 'Healthy weight'? Explain the methods to control healthy body weight to lead healthy-living. *[Delhi 2017]*

## Objective Type/Multiple Choice Answers

**Correct Answer**

**1.** (b) normal **2.** (d) All of the above **3.** (c) Body Mass Index **4.** (a) $kg/m^2$
**5.** (b) Food intolerance

© New Saraswati House (India) Private Limited

CHAPTER 6

# Test & Measurement in Sports

## 2. MEASUREMENT OF CARDIOVASCULAR FITNESS: HARVARD STEP TEST/ ROCKPORT TEST

### Cardiovascular Fitness

Before proceeding to various tests of cardiovascular fitness, it will be essential for us to understand the meaning of cardiovascular fitness. In fact, cardiovascular fitness is the ability of the heart and lungs to supply oxygen-rich blood to the working muscle tissues and the ability of the muscles to use that oxygen to produce energy for movements. This type of fitness is required to sustain physical activity or it can be said that cardiovascular fitness is essential for us to perform aerobic activities. There are following tests to measure the cardiovascular fitness.

### A. Harvard Step Test

**Harvard Step Test** is a cardiovascular fitness test. It is also called Aerobic Fitness Test. It was developed by **Brouha and others** in 1943. It is used to measure the cardiovascular fitness or aerobic fitness by checking the recovery rate.

Harvard step test

**Equipment Required.** A gym bench or box of 20 inches high for men and 16 inches for women, a stopwatch and cadence tape.

**Procedure**

The athlete stands in front of the bench or box. On the command 'Go' the athlete steps up and down on the bench or box at a rate of 30 steps per minute (one second up one second down) for 5 minutes (150 steps). Stopwatch is switched on simultaneously at the start of the stepping. After that the athlete sits down immediately after completion of the test, i.e., after 5 minutes. The total number of heartbeats are counted between 1 to 1.5 minutes after completion of the last step. The heartbeats are counted for 30 seconds period. Again the heartbeats are noted for 30 seconds after the finishing of the test. After that, for the third time, the heartbeats are noted after 3 minutes of completion of the test for 30 seconds period. The same foot must start the step up each time, and an erect posture must be assumed on the bench.

**Calculation of the Score.** The athlete's fitness index score is calculated with the help of following formula.

Fitness index score = (100 × test duration in seconds) divided by (2 × sum of heartbeats in recovery periods).

© New Saraswati House (India) Private Limited

For example, if the total test duration was 300 seconds and the number of heartbeats between 1 to 1.5 minutes was 90, between 2 to 2.5 minutes was 80 and between 3 to 3.5 minutes was 70 then the fitness index score will be:

$$\frac{100 \times 300}{2 \times 240} = 62.5$$

(Here, the sum of the heartbeats are 90 + 80 + 70 = 240 which are counted for 30 seconds each time i.e., between 1 and 1.5 min, 2 and 2.5 min and 3 and 3.5 min after completion of the test.)

| Fitness Index Score | | Rating |
|---|---|---|
| Male | Female | |
| > 90.0 | > 86.0 | Excellent |
| 80.0–90.0 | 76.0–85.9 | Good/Above average |
| 65.0–79.9 | 61.0–75.9 | Average |
| 55.0–64.9 | 50.0–60.9 | Below average |
| < 55 | < 50 | Poor |

### Advantages

1. Minimum equipment are required for conducting this test.
2. It requires minimal cost.
3. It is simple to set up and conduct.

### Disadvantages

There are differences in bio-mechanical characteristics among individuals. But the height of the box or bench remains same for tall individuals and short individuals. It will be easy for tall individuals and difficult for short individuals. The same difference can be seen in case of body weight. Those individuals who are overweight, it will be difficult for them. So, it is not implemented equally to all individuals.

## B. Rockport One Mile Test

Rockport One Mile Test is also known as Rockport Fitness Walking Test. This test is suitable for sedentary individual. The objective of this test is to check or observe the development of the individual's $VO_2$ max i.e., maximum volume of oxygen.

**Equipment Required.** 400 m track, stopwatch, and weighing scale.

### Procedure

While conducting or administering this test, it should be a windless day. First of all, take the body weight of the individual on a perfect weighing machine. The weight should be taken with minimum clothes on body of the individual. Then mark the starting point on a 400 m track (one mile = 1,609 metres). The individual has to run the distance of one mile i.e., 1,609 metres in minimum time. So, record the time of one mile with a stopwatch. Immediately after finishing the one mile walk/run, record the

© New Saraswati House (India) Private Limited

heart rate (beats per minute) with manual or monitor method. The monitor or ECG/EEG can be used to get a more accurate heart rate.

### Calculation of $VO_2$ max

The calculation of $VO_2$ max can be determined with the help of the following formula.

$$= 132.853 - (0.0769 \times \text{Body weight}) - [0.3877 \times \text{Age} + (6.135 \times \text{Gender}) - 3.2649 \times \text{Time}] - (0.1565 \times \text{Heart rate})$$

where,

Body weight is in pounds (lbs).

Gender: Male = 1 and Female = 0

Time is in minutes and 100th of minute.

Heart rate is in beats per minute.

Age is in years.

After calculating the $VO_2$ max, the comparison of the individual can be done with the results of previous tests. It is expected that with appropriate training between each test, the analysis would surely indicate the improvement of the individual.

### Advantages

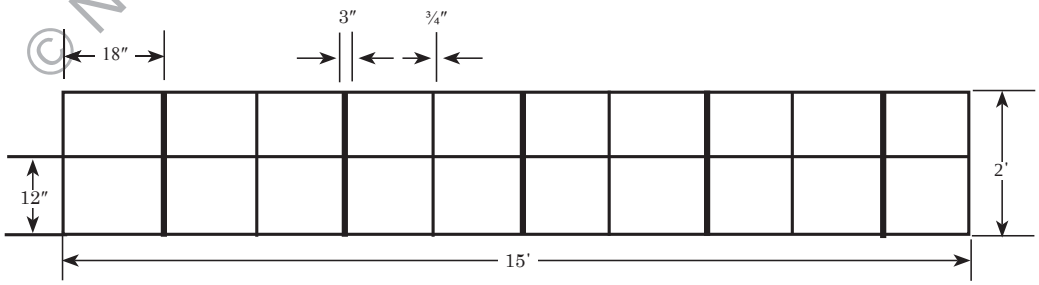
1. Minimum equipment are required.
2. It is simple to set up and conduct.
3. It can be conducted by the athlete.
4. This test can be conducted on more than one individual at a time.

### Disadvantage

Specific facilities are required for this test

## 5. JOHNSON—METHENY TEST OF MOTOR EDUCABILITY—FRONT ROLL, BACK ROLL, JUMPING HALF-TURN, JUMPING FULL-TURN

Johnson–Metheny Test battery is a revised version of Johnson Educability Test which was revised in 1932. Metheny presented a revised version of Johnson Educability Test in 1938. In fact, she found that only four stunts were correlated highly with the total Johnson score. So, she eliminated the six items from Johnson test as earlier there were 10 items. Metheny also modified the mat area used in Jhonson Test. Now this test is known as Johnson-Metheny Motor Educability Test.




© New Saraswati House (India) Private Limited

**Purpose of the Test:** The purpose of this test was to measure neuro-muscular skill capacity.

The test battery consists, of four motor stunts which are stated below.

(*i*) Front Roll (*iii*) Jumping Half–Turns

(*ii*) Back Roll (*iv*) Jumping Full-Turns

Four stunts, i.e., front roll, back roll, jumping-half turns and jumping full-turns are for boys, whereas, three stunts i.e., front roll, back roll and jumping half-turns are for girls.

**Test Area:** The length and width of the mat area is 15 feet and 2 feet, respectively. The 15 feet length is divided into ten sections, of 18″ each. The width of transverse lines is ¾″ and 3″ alternatively as given in the figure. Centre of lines remains 18″ apart. Another ¾″ wide line is marked lengthwise in the middle of the mat area.

## Procedure of the Test

**(i) Front Roll:** Ignoring the long middle dividing line, the subject is asked to start outside the marked area and perform two front rolls, one up to 7.5' i.e., 3″ wide centre line and the second in the other half of 7.5'. The subject is to perform the rolls without touching the limits or over reaching the zones mentioned above.

**Scoring:** Each correct roll gets 5 points, hence maximum of 10 points. Two points are deducted for over-reaching side line, right or left for each roll; one point is deducted for over reaching the end limit on each roll and full five points are deducted when the subject fails to perform a true front roll.

**(ii) Back Roll:** The test is similar to front roll both in performing and scoring. The subject is to start outside the marked chart area and is to perform two back rolls in the 2 feet line area, one up to first half and the second back roll in the second half.

**(iii) Jumping Half-turns:** The subject is asked to start with feet on first 3″ line, jump with both feet to second 3″ wide line executing half turn either right or left; jump to third 3″ line executing half turn in opposite direction to first half-turn and then to 4th and 5th 3″ wide lines executing half turns, right or left alternatively.

**Scoring:** Perfect execution of four jumps is worth ten points. Only 2 points are deducted for each wrong jump when the subject either does not land with both feet on the 3″ line or turns the wrong way or both.

**(iv) Jumping Full-turns:** The subject is asked to start with the feet outside the marked area at about the center of the line. He/She is required to jump with feet together to second rectangular space, executing a full turn with the body either right or left; continue jumping to alternate rectangular spaces across the marked mat executing full turns, rotating body in the same direction landing on both feet every time.

**Scoring:** Perfect execution of five jumps is worth ten points. Two points are deducted, if the subject fails to keep balance on landing on both feet; turns too far or oversteps the squares.

© New Saraswati House (India) Private Limited

# EXERCISES

## Objective Type/Multiple Choice Questions (Carrying 1 Mark)

### Give one word answers.

1. What can be measured by using the following formula?
   132.853 – (0.0769 × Body weight) – (0.3877 × Age + (6.135 × Gender) – 3.2649 × Time) – (0.1565 × Heart Rate)
2. In which year the Harvard Step Test was developed?

### Fill in the blank.

1. ..... can be measured by Rockport One Mile Test.
2. ..... fitness is necessary to perform aerobic activities.
3. The total distance of Rockport Fitness Walking Test is ..... .

### State True or False.

1. Harvard Step Test can be used to measure cardiovascular fitness/aerobic fitness. (True/False)
2. Cardiovascular fitness is necessary to perform aerobic activities. (True/False)

### Choose the correct answer.

1. Metheny presented a revised version of the Johnson Educability Test in.....
   (a) 1928 (b) 1932 (c) 1938 (d) 1942
2. Johnson- Metheny Test battery consists of ..... items.
   (a) 4 (b) 5 (c) 6 (d) 10
3. In which year Harvard Step Test was developed?
   (a) In 1923 (b) In 1933 (c) In 1943 (d) In 1953
4. Johnson-Metheny Test battery does not consists, of ..... motor stunt.
   (a) Back roll (b) Front roll (c) Straddle (d) half-turns
5. Which one of the following motor stunts of Johnson-Metheny Test is not used for girls?
   (a) Front Roll (b) Back Roll (c) half-turns (d) full-turns

## Short Answer Questions-I (Carrying 2 Marks)

1. Discuss Harvard Step Test in brief.
2. Discuss Rockport One Mile Test in brief.
3. Discuss the procedure of front roll and back roll in Johnson Metheny Test.
4. Enlist the test items of Johnson Metheny Test and explain any one of them.
5. Calculate the Physical Fitness Index using short formula for a 12-year-old boy having completed Harvard Step Test for a duration of 3 minutes and a pulse rate of 54 beats for 1 to 1.5 minute.

## Short Answer Questions-II (Carrying 3 Marks)

1. Discuss cardiovascular fitness in brief.
2. Discuss the method of calculation of $VO_2$ Max.
3. Explain the Rockport One Mile Test.
4. Explain in brief the Harvard Step Test.
5. Write a detailed note on Harvard Step Test. *[Delhi 2017, AI 2020]*

## Short Answer Questions-III (Carrying 4 Marks)

1. Discuss the Rockport One Mile Test for cardiovascular fitness.
2. What do you mean by Johnson-Metheny Test of Motor Educability? Elucidate the procedure of the test.
3. Discuss the purpose and procedure of Johnson Metheny Test of Motor Educability

© New Saraswati House (India) Private Limited

4. What do you mean by cardiovascular fitness? Explain the procedure of Harvard Step Test

**Long Answer Questions (Carrying 5 Marks)**

1. Elucidate the Harvard step Test in detail.
2. Elucidate the Rockport One Mile Test in detail.
3. Name the test used to measure cardiovascular fitness and explain its procedure.
4. What do you know about Harvard Step Test? Explain its procedure and administration.
5. What is Johnson-Metheny Test of Motor Educability? Discuss the procedure of the test in detail.

## Objective Type/Multiple Choice Answers

**Give one word answers.**

1. $VO_2$ max (Maximum Volume of Oxygen) **2.** In 1943

**Fill in the blanks.**

1. $VO_2$ max (Maximum Volume of Oxygen) **2.** Cardiovascular **3.** One mile or 1609 metres

**State True or False.**

7. True **8.** True

**Choose the correct answer.**

1. (c) 1938 **2.** (c) 6 **3.** (c) In 1943 **4.** (c) Straddle **5.** (d) full-turns

# CHAPTER 7 Physiology & Injuries in Sports

## 4. PHYSIOLOGICAL CHANGES DUE TO AGEING

### Meaning of Ageing

Ageing is an inevitable and extremely complex, multi-factorial process. It is characterised by the progressive degeneration of organ systems and tissues. It is largely determined by genetics and influenced by a wide range of environmental factors such as diet, exercise, exposure to microorganism, pollutants, radiation, etc. In fact, ageing is a process of gradual changes in the body with the passage of time. These changes are noticeable usually after 30's. Ageing, in its broadest sense is the continuous and irreversible decline in the efficiency of various physiological functions.

Ageing process

© New Saraswati House (India) Private Limited

## Physiological Changes Due to Ageing

The various physiological functions reach their peak approximately during 20 to 30 years. The research studies conducted in this field show that most of the systems or functions after reaching their peak, start decreasing gradually with age. Most of the research studies also show that most of the organs seem to lose physiological functions at about 1% a year beginning around 30 years of age. There are various physiological changes which occur in our body due to ageing process. The major physiological changes due to ageing are stated below.

1. **Changes in Muscle Size and Strength:** When an individual gets older, there is a decline in muscle size. There is a decrease in muscle mass and increase in overall body fat. Due to decrease in muscle size, the strength of the muscles also decreases. The decrease in strength gradually occurs during the age of 35 to 45 years. However, even at the age of 60 the decrease in strength does not appear to exceed 20% of an individual's maximum strength.
2. **Changes in Metabolism and Body Composition:** With advancement of age, our body needs less energy and the metabolism slows down. Consequently, there is an increase in the accumulation of body fat and therefore the lean body weight (bones, ligaments, tissues, tendons, muscles and water) decreases. The metabolic rate decreases gradually with the increasing age. It also results in more accumulation of body fat.
3. **Changes in Bone Density:** With the advancement of age, the bone density decreases. It means that the elderly people especially those over 40 years of age, are more prone to bone injury than young people. In fact, it is due to decrease in various minerals such as calcium and phosphorus, found in the bones. Bones become less dense and more porous. The decreasing process of these minerals begins in the early 40's. Less bone density can result in osteoporosis and reduction of weight bearing capacity which may lead to fracture. There can be reduction in height due to the thinning of vertebrae.
4. **Changes in Respiratory System:** A number of research studies show that pulmonary function is impaired with advancing age. The airways and lung tissues become less elastic. They become less efficient. There is decreased oxygen uptake and oxygen exchange. The muscles of the ribcage become weak. Hence, the ability to breathe deeply is reduced. Pulmonary oxygen is reduced which leads to decreased endurance with shortness of breath and fatigue. It can be said that tidal volume, vital capacity, lung capacity are decreased, whereas, residual volume is increased.
5. **Changes in Cardiovascular System:** With advancing age, there is a progressive decrease in cardiac muscle strength. The stroke volume, cardiac output and blood flow are all decreased with age. Blood vessels also lose their elasticity. They become more and more rigid. Systolic blood pressure also increases with age. The reduced blood flow results in reduced endurance. There is less nourishment to cells of body. Heart valves become less flexible.

© New Saraswati House (India) Private Limited

6. **Changes in Nervous System:** A number of research studies indicate that reaction time and movement time slow down with increasing age. The brain's weight, the size of its network and its blood flow decreases with age. However, the brain adapts to these changes, growing new patterns of nerve endings. To recall old memories becomes slow.
7. **Changes in the Gastrointestinal System:** With increasing age, there is a reduction in the production of hydrochloric acid, digestive enzymes and saliva. These changes may result in delayed emptying of stomach, impaired swallowing. The breakdown and absorption of foods may also be impaired. The liver becomes less efficient in metabolising drugs and repairing damaged liver cells.
8. **Changes in Urinary System:** As we grow old, the mass of the kidneys decreases. This leads to reduction in the rate of blood filtration by the kidneys. The capacity of bladder decreases and there is an increase in residual urine. These changes increase the chances of urinary infections. With increasing age, it takes a long time for kidneys to get rid of waste products. These substances tend to remain in the body for a longer period of time.
9. **Changes in Flexibility:** The elasticity of tendons, ligaments and joint capsules is decreased with ageing. The elderly persons lose 8–10 cm of lower back and hip flexibility according to a research study. The range of movement is restricted as the age increases.
10. **Changes in Senses:** With advancing age, the senses such as vision, hearing, taste, smell, touch, etc., may become less acute. Vision and hearing are most affected by ageing. The main changes in senses are elaborated below.
    - (*a*) **Change in Vision:** Visual impairment is the most common sensory problem of ageing. In 40's, the pupil begins to decrease in size and in response to light. The lenses in the eyes become less flexible. The change in vision can affect the ability to drive safely. Retina becomes less efficient. The lens of the eye becomes yellow, more rigid and slightly cloudy.
    - (*b*) **Changes in Hearing:** Hearing loss is common with ageing. The sense of balance weakens with ageing. The older people may complain of dizziness and find it difficult to move quickly without losing their balance. Tinnitus is more common among older adults.
    - (*c*) **Changes in Taste:** Taste also diminishes with age. In fact, total number of taste buds are reduced with ageing and so the elderly people experience some decline in the ability to taste. It can cause loss of interest in food.
    - (*d*) **Change in Smell:** After the age of 50, the sense of smell decreases rapidly. As a matter of fact, the number of functioning smell receptors in the upper sinus decreases.

In conclusion, it can be said that a number of physiological changes occur in our body as we grow old. These changes include a decrease in muscle size and strength, decrease in metabolic rate, decrease in lean body mass, increase in

© New Saraswati House (India) Private Limited

body fat percentage, decline in blood flow, decrease in stroke volume, decline in cardiac output, decrease in vital capacity, slower reaction and movement time, decrease in senses, etc.

## EXERCISES

### Short Answer Questions-I (Carrying 2 Marks)

1. Briefly discuss the meaning of ageing.
2. How do changes in muscle size and strength take place due to ageing?
3. How does bone density change due to ageing?
4. Briefly explain about ageing.

### Short Answer Questions-II (Carrying 3 Marks)

1. Discuss any three effects of ageing process.
2. Discuss any three physiological changes in human body due to ageing.
3. Discuss physiological changes in senses due to ageing process.
4. Explain about any three physiological changes which occur with ageing in a person.

### Short Answer Questions-III (Carrying 4 Marks)

1. Discuss any four physiological changes due to ageing.
2. Elaborate any four effects of ageing on an individual.

### Long Answer Questions (Carrying 5 Marks)

1. What do you mean by ageing? Elucidate the physiological changes which take place in an individual due to ageing.

# CHAPTER 8 Biomechanics and Sports

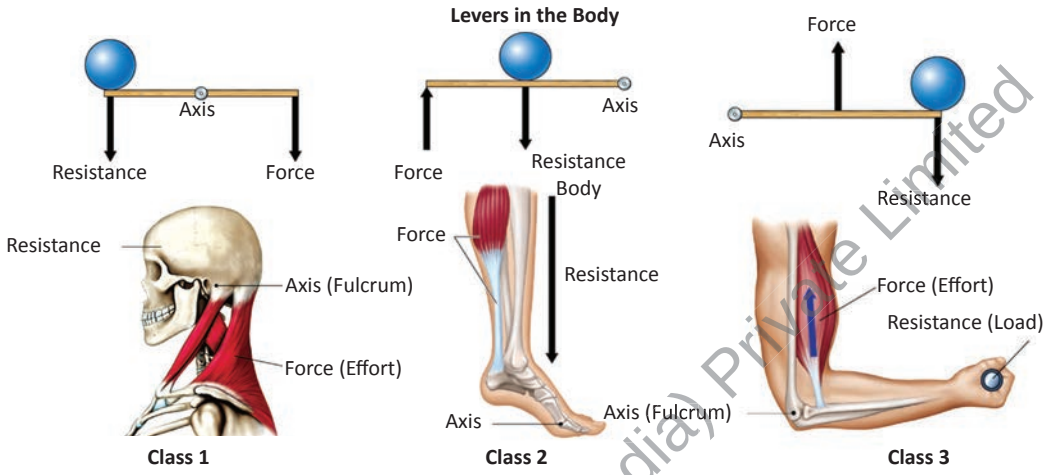
## 2. TYPES OF LEVERS, AND THEIR APPLICATION IN SPORTS

### Lever

A lever is a simple machine that provides mechanical advantage to magnify the force necessary to overcome a resistance. Levers are used in daily life. Levers are also used frequently in the games and sports. Our body also consists of many levers which are made up of bones and muscles. Our body parts such as legs, arms and fingers work as levers. The levers of human body allow the body to move and generate force. With the help of these levers, the work can be done easily. Different sport equipment such as bats, racquets also act as levers. Such types of

© New Saraswati House (India) Private Limited

levers allow the sportspersons to hit the objects/balls faster and farther. In the field of games and sports, it is essential to know the mechanics of levers. It is also necessary to know how they work and allow sportspersons to perform efficiently. Every lever has a point at which the force is applied, a point of resistance and a fulcrum or axis.




Levers in the body

## Types of Levers and their Application in Sports

There are three types of levers, which play a vital role in sports and physical activities with a slight difference.

1. **Class-1 Lever:** Class-1 levers have the fulcrum between the effort (force) and load (resistance). Examples of class-1 levers are the playground see-saw, the action of rower's oar, where the force is applied by the rower, the fulcrum is the oarlock and the water offers the resistance (load), seated dumbbell triceps extension and hand grippers. This type of lever is also found in the neck when raising your head to head a football. The neck muscles provide the effort, the neck is the fulcrum and the weight of the head is the load. Looking up and down or side to side to watch the ball in a tennis serve is also the example of Ist class lever.
2. **Class-2 Lever:** Class-2 levers have load (resistance) between the effort (force) and the fulcrum. Examples of class-2 levers are when an individual stands on tiptoe to play a smash; the length of the foot is the arm of the lever, the ball of the foot acts as the fulcrum and achilles tendon and calf muscles provide the effort (force), lifting the weight of the body by the back of the heel and calisthenics that use the body as class-2 lever include push ups and leg lifts. The second class lever is also used when taking off for a jump (it may be a jumping in Volleyball to block a shot) or pushing against the blocks in a sprint start.

© New Saraswati House (India) Private Limited

3. **Class-3 Lever:** Class-3 levers have the effort (force) between the load (resistance) and the fulcrum. A lot of sports equipment use class-3 levers, including tennis racquets, baseball bats, boat paddles, etc. Our forearms also act as class-3 lever with the elbow as the fulcrum. A fishing pole is also a class-3 lever where hand at the end of the pole is the fulcrum and the fish you catch on the opposite end is the load and the hand between the fulcrum and the fish (load) applies effort (force). There are other examples of class-3 levers such as leg extension, seated bicep curl, football throw, kicking a ball, hamstring curl, etc.

## EXERCISES

### Objective Type/Multiple Choice Questions (Carrying 1 Mark)

**Choose the correct answer.**

1. What are the main components of a lever?
   (a) Mass, Force & Velocity (b) Force, Effort & Load
   (c) Fulcrum, Load & Effort (d) Mass, Load & Speed
2. Taking sprint start from blocks is an example of:
   (a) Ist Class lever (b) 2nd class lever
   (c) 3rd Class lever (d) None of the above
3. Watching a tennis ball side to side is an example of:
   (a) Ist Class lever (b) 2nd Class lever
   (c) 3rd Class lever (d) None of the above

### Short Answer Questions-I (Carrying 2 Marks)

1. Discuss the Class I lever with the help of examples in the field of sports.
2. Define lever and discuss any one type of lever with examples.

### Short Answer Questions-II (Carrying 3 Marks)

1. Briefly explain the meaning of lever.
2. Discuss the types of levers.
4. With the help of examples, discuss the 2nd Class lever in detail.
5. What do you mean by lever? Explain any two types of levers with examples.

### Long Answer Questions (Carrying 5 Marks)

1. What do you mean by lever? Elaborate the types of levers and their applications in sports.
2. Define lever. Explain the types of lever with the help of examples from the field of sports.

© New Saraswati House (India) Private Limited

## Objective Type/Multiple Choice Answers

**Correct Answer**

**1.** (c) Fulcrum, Load & Effort **2.** (b) 2nd Class lever **3.** (a) Ist Class lever

CHAPTER 9

# Psychology and Sports

## 2. MOTIVATION, ITS TYPES AND TECHNIQUES

### Meaning and Definitions of Motivation

*Kilimanjaro is a snow-covered mountain that is 19,710 feet high and is said to be the highest mountain in Africa....close to the western summit there is the dried and frozen carcass of a leopard. No one has explained what the leopard was seeking at that altitude.*

—Ernest Hemingway

Motivation—key to success

In the above passage, two points draw the attention of the reader. First, the behaviour of the leopard was purposive—that he was trying to find out something by climbing on the snow-covered peak. Second, to understand the leopard's behaviour, we would have to understand his purpose—what he was seeking. But one thing is sure that there was some force of motivation behind such action. Motivation is the main determinant of an individual's behaviour. The term 'Motivation' is derived from the word 'Motive'. Motive is a combination of thought, feeling or condition that causes one to act. Motive can be for a short period or can be for a longer one. If a child takes a colourful ball, he plays with the ball but if, in the meantime, he is attracted towards the other colourful ball, or toy, then we say that his motive for the first ball was for a short period. But, if a player wants to win gold medal at the international level and he/she works hard for years to get the gold medal, we say that his/her motive is for a long period.

Human behaviour is controlled, directed and modified through certain motives. When a person feels hungry and searches for food, we say that he/she is motivated by his/her drive, i.e., biological drive. When he/she gets food and is satisfied, we say that his/her drive for food has been fulfilled.

Motivation is one of the main psychological factors which affects performance. Motivation means to be inspired to do something. The definition of motivation is to give reason, enthusiasm or interest that causes a specific action or certain behaviour. Motivation is present in every function of life. Simple acts such as eating and drinking are motivated by hunger and thirst, respectively. The following definitions may clarify the meaning of motivation more explicitly.

According to **Crooks and Stein,** *"Any condition, that might energise and direct our actions"* is called motivation.

According to **Sage,** *"The drive to strive" is called motivation.*

According to **Alderman,** *"Motivation is the general level of arousal to action in an individual."*

© New Saraswati House (India) Private Limited

*"Motivation is the inclination to pursue and persist in activities related to one's sports."*

Hence, it can be alluded after analysis of the above definitions that motivation is the inner condition of the individual that initiates or directs its behaviour towards a goal.

In fact, motivation is that force which incites individuals to perform some activities. It also determines the individual's direction of action and his intensity of action. When an individual is motivated, he/she experiences a tension and disequilibrium and becomes restless and thus, his/her actions are initiated. The individual feels an urge to behave in a certain direction. It is averred that motivation is the heart of learning process but it is not the sole determinant of what we perform. Motivation is not enough to put football player in the team. He/she must also have the requisite health, size, skill, intelligence, opportunity and field forces. If one acquires these traits, through proper motivation, he/she will be able to show marvellous achievements.

## Types of Motivation

There are two types of motivation.

1. Intrinsic Motivation 2.Extrinsic Motivation

1. **Intrinsic Motivation:** Intrinsic motivation is internal. It occurs when people are compelled to do something out of pleasure, importance or desire. Motivation is always intrinsic when the force comes from within oneself. For example, when a person indulges in any sports to have mastery, to display superiority or to gain social approval, it is an intrinsic motivation. He/she participates in sports for his/her own sake.
2. **Extrinsic Motivation:** Extrinsic motivation is external. It occurs when external factors compel the person to do something. Motivation is always extrinsic, when external forces, positive or negative produce a behavioural change. Reward, punishment, praise, blame or cash prize are examples of extrinsic motivation. It has been found that such devices motivate some persons more strongly than others. In fact, extrinsic motivation includes factors that motivate the individual in achieving the goals.

## Techniques of Motivation

Various techniques of motivation are applied on sportspersons, which can enable them to achieve the top positions in the field of sports and games. These techniques of motivation are described below.

1. **Goal Setting:** Goal setting is one of the most important techniques of motivation. If you do not set a goal, you cannot achieve apex positions in your life. So, the sportspersons should be encouraged to set few ambitious but achievable long-term goals. They should set goals according to their capabilities and capacities. To keep them on the track with their long-term goals, sportspersons should also set the appropriate medium-term goals as well as short-term goals. For example, if a sportsperson wants to get a position in Olympic games, he should also set medium-term and short-term goals for getting positions at Asian Games and National Games, respectively. Goals should be monitored on a regular basis. The coaches or physical education teachers should not be too rigid while setting goals for a sportsperson. There should be some flexibility in their approach.

© New Saraswati House (India) Private Limited

2. **Elaborate Arrangements of Competition:** Elaborate arrangements of competition play a significant role in motivation. Sportspersons perform better in competition when the arrangements of competition are elaborate. Without extensive arrangements of competitions, good sportspersons also cannot perform well in such competitions.
3. **Spectators:** If there is a huge number of spectators, it will have a positive effect on the players. But its effectiveness depends upon the experience and maturity of athletes. If an inexperienced athlete participates in competition, which is full of spectators, then he will not be able to perform better in comparison to an experienced athlete. An inexperienced athlete is usually overpowered by fear.

Healthy environment enhances performance

4. **Verbal Comments:** Various factors of motivation are applied at various stages. Verbal comments should be applied during competition. It also varies according to the past experience of the player. Experienced players are not generally motivated by verbal comments, whereas, beginners are motivated by this factor. Verbal comments should be used immediately. It is said that *hit the iron when it is hot*. In the same way, verbal comments should be used at appropriate time.
5. **Hypnotism:** Motivation through hypnotism can be effective but, generally, it is discarded by the public. It has its scientific base. Several studies show its positive effects. Simple and direct strength may be improved through hypnotism if it is properly employed by a trained person.
6. **Healthy Sports Environment:** Healthy sports environment plays a vital role in motivating the sportspersons. Healthy sports environment consists of good climate, proper weather, humidity and temperature, smooth and clean sports fields, good quality of sports equipment and other facilities. In such healthy sports environment, sportspersons can do sound sports training and can exhibit good performance in competition.
7. **Knowledge of Results:** Experimental studies indicate that a person who has the knowledge of his/her progress, will learn more rapidly than an equally motivated learner of comparable ability, who is working in the dark. It can be said that an individual, who does not know where he/she is standing cannot reach his/her destination. Knowledge of progress or results is must because progress is also a reward in itself. Good progress will definitely motivate the individual. Keeping this in mind, various competitions are organised. Examinations are conducted. The concerned coaches should have separate records of results and these results should be shown and discussed in a positive manner with sportsmen. If any hindrance comes in the way of progress, it should be tackled intelligently.

© New Saraswati House (India) Private Limited

8. **Praise or Blame:** Praise or blame are effective factors of motivation if given at a proper time and in appropriate amount. Sometimes, if blame is given at improper time, it can be dangerous. The individual may withdraw himself from that activity. Praise is also better but too much praise can destroy the future of the sportsmen. It should be according to the requirement. Due to individual differences, the effect of these factors vary according to individual's nature. So, the coach should have the knowledge of the behavioural patterns of sportsmen on whom he wants to apply these factors. Mature athletes have least concern about praise.
9. **Cash Prizes, Certificates and Trophies:** Indeed, it is a good incentive to the sportspersons. It motivates the individual. Every government strives hard to achieve better in international competitions. Therefore, these governments offer cash prizes to the sportspersons, who win the laurels for their countries. This proves to be a good source of motivation to the sportspersons, who are not economically sound. The rewards should be presented in front of all the recipients.
10. **Motivational Music:** It is particularly a good way to motivate sportspersons in training and prior to competition but it should be inspirational one. It can be performed during indoor training sessions. Fast music during circuit training and slow music during recovery period are appropriate. It is being used particularly in indoor games in western countries. It increases work output and reduces perceived exertion.
11. **Positive Attitude:** For proper motivation, the coaches should try to encourage positive attitude among sportspersons. They should lay proper emphasis on the 'can be' mindset of players. It means that players must think that they can achieve anything. They should remember that champions' feet and hands are not made up of gold; they are made up of bones and flesh. So, they can also be the champions.

Positive attitude

12. **Positive Self-talk:** Positive self-talk is a technique that can be used to enhance motivation. With proper repetition of self-talk can change a sportsperson's belief system. **Mohammed Ali**, the world-famous boxer of USA used to apply this technique. He used to repeat, "*I am the greatest*." He repeated his claim that his opponents believed it.

The various techniques which have been mentioned above, play a significant role in motivating a player towards his/her achievement in sports and games. It depends upon coaches to know which technique or a combination of techniques is more applicable upon an athlete. Sometimes, a single technique cannot yield much. At this stage, a combination of techniques can have positive effect. The coaches should also bear in mind, the age of athlete, his past experience of competitions. It is difficult

© New Saraswati House (India) Private Limited

job for the coach to ascertain what technique or combination of techniques inspires a particular athlete to perform and to aid him or her in acquiring these techniques for better performance.

## 3. EXERCISE ADHERENCE, REASONS TO EXERCISE, BENEFITS OF EXERCISE AND STRATEGIES FOR ENCHAINING IT

### Exercise Adherence

Exercise Adherence is a combination of two words 'exercise' and 'adherence'. Exercise means any movement that makes your muscles work and requires your body to burn calories, whereas adherence means "to stick". In fact, exercise adherence refers to maintaining an exercise regimen for a prolonged period of time following the initial adoption phase. It can also be said that exercise adherence is sticking to your daily exercises and goals. It can also be defined as the maintenance of an active involvement in physical exercise. Those individuals who have strong exercise adherence continue participating in exercises despite opportunities and pressures to withdraw.

#### Reasons to Exercise

Most probably everyone is well aware about the significance of exercise, but do we know well the reasons to exercise? In fact many of us are not aware about the reasons to exercise. There are following reasons to exercise:

1. **Enhanced Physical Appearance:** Not only can exercise help you feel better, but it also helps us to look better as well. However, genetics play a major role in our physical or overall appearance. As a matter of fact, everybody wants to have a good as well as healthy physical appearance. Exercise can enhance our physical as well as overall appearance. That is why exercise is important.
2. **Improved Psychological/Emotional Health:** Improved psychological/emotional health is also one of the reasons to exercise. In fact, exercise has been proven to provide a mood booster as it releases chemicals like endorphins into our brain that help us to feel happier and can ease the effects of depression, ADHD and anxiety. It can also help in improving self-esteem and self-confidence. Exercise also helps in reducing the levels of stress. For such reasons we tend to do exercise.
2. **Feel More Energized:** One of the reasons to exercise regularly is that it gives us more energy or we feel more energized. Indeed, a workout can help oxygen flow more freely throughout the body and give us a much needed burst of energy. This burst of energy not only occurs during exercise, but also after exercise.
3. **Decreased Risk of Diseases:** Decreasing the risk of diseases is also one of the reasons to exercise. As a matter of fact, exercise builds up and improves circulation of white blood cells, which we need to get rid of harmful bacteria that cause us to fall sick. It boosts our immune system and makes us more resilient to diseases or illnesses.
4. **For Controlling Body Weight:** Controlling body weight is another reason to exercise. If it is done regularly, it helps to control and manage our body weight. Exercise burns calories, which results in shedding our extra body weight.

© New Saraswati House (India) Private Limited

5. **For Long-term Health:** Gaining long-term health is also one of the reasons to exercise. Regular exercise can avert various cardiovascular diseases, diabetes, etc., in the long term. Working out regularly increases good cholesterol and decreases the risk of serious medical issues, especially those pertaining to heart. Even it has been proved through research studies that exercise adds years to our life.
6. **For Improved Social Relations:** Improved social relations is also one of the significant reasons to exercise. For good social health, social relations are essential. By joining an exercise group or a class such as dance, hiking club or volleyball team, our social relations are improved.
7. **For Improved Physiological Health and Fitness:** To attain improved physiological health and fitness is a reason to exercise. In fact, regular exercise improves the physiological health. All the systems of our body become efficient. The fitness of an individual is also improved by regular exercise.

### Benefits of Exercise

In today's world, most of the persons are falling prey to various lifestyle diseases. In fact, they do not perform regular exercise. Most of them are not well aware regarding the physical/physiological, social and psychological benefits of exercise. These benefits are stated below:

1. **Reduced Risk of Heart Diseases:** Regular exercise gradually reduces the stress related hormones from circulating in the blood stream. This increases the blood vessel path, which in turn lowers the risk for developing plaque that can lead to various heart diseases such as coronary heart diseases.
2. **Helps in Keeping Correct Body Posture:** By doing exercise, the strength of muscles increases, which in turn, keeps the body posture in correct position. Also postural deformities do not occur. If there is any postural deformity, it is removed by engaging in exercise.
3. **Improves Mood:** Exercise makes most of the individuals feel good and when they feel good their good energy seem to elevate. It is considered that it is due to the release of hormones called endorphins. A number of research studies, indicate that the individuals who perform regular exercise have a more positive outlook in their life and are happier in comparison to the individuals who do not do any exercise. Regular exercise eventually improve the overall mental health over the long term.
4. **Boosts Memory:** Regular physical exercise boosts memory and ability to learn new things. In fact, regular exercises increase hippocampus cells which are responsible for memory and learning. Research studies indicate that running sprints improves vocabulary retention among healthy adults. Some studies also show that regular physical exercise helps neurons to stay in shape, especially in the memory areas of brain.
5. **Reduces Depression:** Research studies indicate that regular physical exercise can greatly reduce depression and in some cases prevent the symptoms of depression. As a matter of fact, aerobic and anaerobic exercises seem to be equally effective in producing antidepressant effects. Exercise is considered

© New Saraswati House (India) Private Limited

the most important element in comprehensive treatment programmes for depression. Scientists believe that enhancing body image, improving moods, overall health and physical appearance boost self-confidence and create a feeling of success, which automatically reduces depression.

6. **Lowers Anxiety:** Regular exercise also reduces or lowers anxiety. As the level of endorphins increases due to regular exercise, the feeling of worry also begins to diminish. In fact, during exercise we usually forget our daily problems. We concentrate on our workout. We gain fresh perspective on situations. When we return to those problems later, we approach them with renewed energy and new ways to find solutions.

7. **Strengthens Bones and Muscles:** Regular exercise helps in strengthening bones and muscles. It can also slow down the loss of bone density that comes with age. Doing muscle strengthening exercise can help in increasing and maintaining muscle mass and strength. Exercise stimulates bone growth. Research studies show that the bone density can be increased with the help of regular exercise in aged persons. Such persons may keep away themselves from fracture and osteoporosis.
8. **Improves Mental Alertness:** Stress, tension and fatigue negatively affect concentration, comprehension and memory. Since exercise is the best way to reduce stress and improve energy levels, a regular exercise will enhance mental alertness. By improving the circulation of blood and consequently that of oxygen and nutrients, our brain can think better.
9. **Reduces Stress:** A number of studies show that regular exercises help individuals to manage stress more effectively. In fact, it is one of the best method to reduce stress. As mentioned above, exercises are helpful in relieving stress by releasing endorphins. Aerobic exercises are good for reducing stress.
10. **Enhances Self-esteem:** Regular exercise has positive connection in enhancing self-esteem. This connection or relationship appears to be stronger with those who have lower self-esteem. Some studies related to self-esteem and exercise show that strenuous exercises tend to enhance self-esteem.
11. **Improves Self-confidence and Body Image:** It is usually seen that most of the people feel unhappy and dissatisfied about their physical appearance. After regular exercise, most of the people begin to see positive physical changes. After having seen the results, they tend to feel proud of their success. They also feel good. How we feel about ourselves affects how we use our bodies. Feeling of distress can cause us to hunch our bodies as an effort of self-protection. As a result, our spines get compressed and our breathing gets shallow. We limit our movements and our muscles and joints become stiff and weak. In fact, exercises help us to stand erect, feel better and face the world with a positive outlook.

© New Saraswati House (India) Private Limited

12. **Delays Fatigue:** Exercise helps in delaying fatigue. As a matter of fact, fatigue is caused mainly due to formation of $CO_2$, lactic acid and acid phosphate. The accumulation of $CO_2$, acid phosphate and lactic acid becomes less in an individual who exercises regularly.
13. **Provides Health Benefits:** Regular exercise gives a healthy, glowing look and is a natural anti-aging technique. It improves digestion, and helps us to get good sleep. Due to exercise, we look fresh and energetic, when we wake up next day.
14. **Helps in Early Recovery from Injury:** Exercise helps repair body from damage done by injury. When we increase muscular tissues and white blood cells by exercising, our body is better able to reduce inflammation that occurs from injury.
15. **Improves Flexibility:** Exercise improves the elasticity of tendons, ligaments and joint capsules. Exercise also decreases the stiffness of joints. In this way, there is an improvement in flexibility.
16. **Feeling Great Overall:** Exercise helps us to have an overall great feeling. As a matter of fact, combination of enhanced self-confidence, reduced stress and tension, reduced anxiety, improved moods, reduced depression and improved mental health along with physical and physiological benefits definitely makes an individual feel great about everything.

## Strategies for Enhancing Adherence to Exercise

There is no doubt that most of the persons believe that exercise would definitely make them more fit and healthy even though they still don't adhere to exercise. They may have both real as well as perceived problems or barriers such as lack of time, lack of social support, lack of energy, lack of will power, lack of self-efficacy (confidence in their ability to perform exercise and to succeed) and lack of access to facilities, However, there is no surprise that beginning and adhering to exercise can be mentally and emotionally difficult. For enhancing adherence to exercise, there is a variety of strategies which are described below:

1. **Simple Exercise in the Beginning:** There is a simple rule for motor development i.e., simple to complex. It should be applied to those who are freshers or novice. As a matter of fact, simple exercises (workouts) such as walking, jogging, yoga, etc., should be done in the beginning. These exercises require no equipment and no excuses. These exercises require only track suit and a pair of shoes. These are not complicated but simple ones. You can adhere to such exercises due to their nature of simplicity. Planks, push ups, body weight squats, lunges, jumping on the spot and brisk walking are simple exercises that can be added in the beginning. So, for enhancing adherence to exercise follow simple exercises in the beginning.
2. **Exercise in the Morning:** For enhancing adherence to exercise, you should start your exercise regimen in the morning because you feel more fresh and energetic in the morning instead of evening. Also, due to fatigue and remaining busy in other jobs in the evening do not allow you to adhere to your exercise regimen. You may have more chances to skip your workout in the evening. So you should do exercises in the morning session.

© New Saraswati House (India) Private Limited

3. **Concentrate Only on Yourself:** It is a fact that there will always be someone fitter, faster and more flexible than you. Don't compare yourself to them. Don't let them deter you from your goal. Your workout or exercise time is for you and about you. Just think about yourself. Don't interfere with others.
4. **Set Appropriate Goal:** You should set your appropriate goal i.e., what is your clear cut purpose for exercise? While setting the goal you should know about your capacities and capabilities. Your goal should be achievable. You may set your goal for one month. If you want to lose weight then take a pledge that you will lose 250 gm per month. After that you can set your goal for weight control. In fact, the goals should be specific, measurable, attainable, realistic and time-bound.
5. **Take Support of Others:** People are socially motivated. It is usually seen that they tend to exercise more frequently, more intensely and longer when they are with other people. They also tend to enjoy their exercise regimen more. When people have strong social relation and support, they are more likely to remain active for long term. If you promise to meet a partner for regularly scheduled gym time, it is a great way to stick or adhere to an exercise regimen. Such adherence to exercise is impossible, if you are alone to do exercise.
6. **Thank Yourself:** If you are exercising regularly, you are doing it for yourself not for others. Really, it is a very significant strategy to remember. It is a part of inducement you need to be successful. If you are exercising for others it will only bring you down in the long run. You can never live up to other's expectations. Make an unbreakable vow with yourself that the only person you have to answer to is yourself. Thank yourself, if you are able to stick to your exercise programme effectively. It will further motivate you to workout persistently.
7. **Select Interesting Exercises:** For enhancing appropriate adherence to exercise, you should select such exercises in your exercise programme which are interesting to you. If you don't do interesting exercise you cannot stick to your exercise regimen for a longer term.
8. **Be Punctual:** Whenever you start exercising, you should be punctual. If you do not start your regular exercise programme at an exact time, you cannot adhere to exercise. If you do not understand the value of time you can't stick to your exercise regimen.
9. **Make a Schedule:** For enhancing the adherence to exercise you should make an appropriate schedule. As a matter of fact it is harder to ignore something when it is already on your schedule. It should be well-planned so that you can resist effectively the urge to skip it. If you have a good schedule, you cannot get excuses.
10. **Be Aware about your Progress:** For adherence to exercise you should be aware about your progress. If you do not know your progress it will be difficult to stick your workout for a long term. The knowledge of your progress will further motivate you to remain engaged to your exercise programme.

© New Saraswati House (India) Private Limited

11. **Variety in Exercise Programme.** There should be a variety in your exercise programme. If you don't have a variety, it will create boredom. It will be difficult for you to adhere to such an exercise programme. So for enhancing adherence to exercise there should be variety in such programmes.

## EXERCISES

### Objective Type/Multiple Choice Questions (Carrying 1 Mark)

**Give one word answers.**

1. Who said "The drive to strive is called motivation".
2. What is that motivation, which occurs when people are compelled to do something out of pleasure, importance or desire?
3. What is that motivation, which occurs when external factors compel the person to do something?
4. Which hormone is responsible for elevating mood?

**Fill in the blanks.**

1. The term 'Motivation' is derived from the word ..... .
2. The drive to strive is called ..... .

**State True or False.**

1. Positive attitude can play a significant role in motivating a sportsperson. (True/False)
2. Regular exercise improves the level of anxiety. (True/False)
3. The release of endorphins, due to regular exercise, improves our mood. (True/False)

**Choose the correct answer.**

1. Which one of the following is not a technique of motivating in the field of sports?
   (a) Presence of spectators (b) Goal setting
   (c) Ignorance (d) Praise or blame
2. What is the reason to do exercise regularly? *[AI 2020]*
   (a) To enhance physical appearance (b) To feel more energetic
   (c) To decrease the risk of diseases (d) All the above
3. Which one of the following is not the benefit of exercise?
   (a) Improves mood (b) Improves anxiety
   (c) Improves self confidence (d) Improves flexibility
4. Which one of the following is not the strategy for enhancing adherence to exercise?
   (a) Simple exercise in the beginning (b) Set appropriate goal
   (c) Same pattern of exercise (d) Always remain punctual
5. Which type of motivation occurs when people are compelled to do something out of pleasure, importance or desire?
   (a) Intrinsic motivation (b) External motivation
   (c) Environmental motivation (d) None of these
6. Which one of the following is the reason of doing exercise?
   (a) For good emotional health (b) For improved health and fitness
   (c) For reducing the risk of lifestyle diseases (d) All the above

© New Saraswati House (India) Private Limited

### Short Answer Questions-I (Carrying 2 Marks)

1. Define the term "Motivation"
2. Differentiate between Intrinsic and Extrinsic Motivation.
3. Discuss any two techniques of motivation.
4. Enlist the benefits of exercise and discuss any two benefits.
5. Discuss any two reasons to exercise.

### Short Answer Questions-II (Carrying 3 Marks)

**4.** Explain about any three techniques of extrinsic motivation.
**5.** Discuss intrinsic and extrinsic motivation.
**6.** Elucidate any three techniques of motivation. *[AI 2020]*
**7.** Explain any three reasons to exercise in detail.
**8.** Explain any three benefits of exercise in detail.
**9.** Explain any four techniques of motivation for higher achievement in sports.
**10.** Define motivation and discuss its types.
**11.** Discuss any three strategies for enhancing adherence to exercise in detail.
**12.** What do you mean by motivation? Explain the different techniques of motivation to achieve high goals in sports. *[AI 2017]*
**13.** Explain the strategies for enhancing adherence to exercise. *[CBSE 2019]*
**14.** What do you understand by exercise adherence? *[AI 2020]*

### Short Answer Questions-III (Carrying 4 Marks)

**1.** What do you mean by motivation? Discuss any three techniques of motivation.
**2.** What is exercise adherence? Explain three reasons of exercise.
**3.** Elaborate any four strategies for enhancing exercise.
**4.** Elucidate any four benefits of exercise.

### Long Answer Questions (Carrying 5 Marks)

**1.** Define motivation. Elucidate any five techniques of motivation.
**2.** Elucidate the effects of regular exercise on an individual.
**3.** Differentiate between intrinsic and extrinsic motivation. Explain in detail goal setting and reinforcement as techniques of motivation. *[AI 2016]*
**4.** Suggest various methods for motivating a person for better performance in sports and games.
**5.** What do you mean by exercise adherence? Elucidate the reasons to exercise.
**6.** Discuss the benefits of exercise in detail.
**7.** What is exercise adherence? Discuss the strategies for enhancing adherence to exercise.
**8.** Most of the persons understand the importance of exercises but they do not adhere to exercise. What strategies will you adopt for enhancing adherence to exercise for such persons? Explain.

## Objective Type/Multiple Choice Answers

### One word answer

**1.** Sage **2.** Intrinsic Motivation **3.** Extrinsic Motivation **4.** Endorphins

### Fill in the Blanks

**1.** Motive **2.** Motivation

### State True or False

**1.** True **2.** False **3.** True

### Correct Option

**1.** (c) Ignorance **2.** (d) All the above **3.** (b) Improves anxiety
**4.** (c) Same pattern of exercise **5.** (a) Intrinsic 6. (d) All the above

© New Saraswati House (India) Private Limited

CHAPTER 10

# Training in Sports

## 5. CIRCUIT TRAINING— INTRODUCTION AND ITS IMPORTANCE

### Circuit Training

Circuit training method was designed by **G T Adamson** and **R E Morgan** of Leeds University in 1957. It is a scientific arrangement of exercises, performed systematically and repeatedly as circuit. Circuit training consists of various types of exercises.

*"Circuit training is the training method in which certain exercises of various kinds are performed with or without apparatus with given dosage."*

**–Adamson and Morgan**

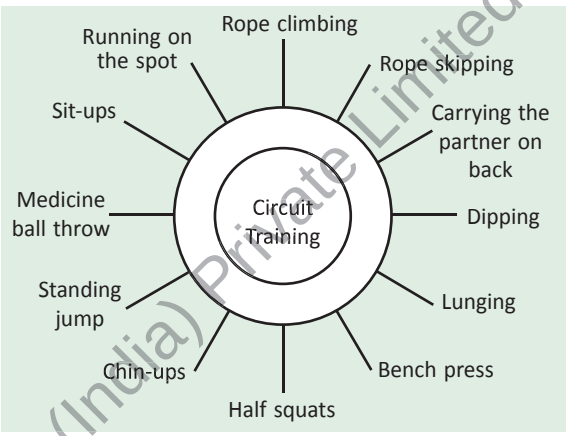



Diagram of Circuit Training along with Stations

The main objective of circuit training is to develop endurance and strength along with flexibility and mobility.

### Types of Circuit Training

According to the requirement, many changes can be done in the structure of circuit training but following are the main types of circuit training.

1. **Timed Circuit Training:** In this type of training, the duration of rest and workout remains fixed. For example, each exercise is done for at least 30 seconds and after that a rest period of 30 seconds is given to the trainee.
2. **Competition Circuit Training:** This type of training is approximately the same as timed circuit training but in this training emphasis is on the number of repetitions you make in 30 seconds. For example, if you do normally 12 sit-ups in 30 seconds, then from the competition point of view, you will have to try to increase the number of sit-ups in 30 seconds.
3. **Repetition Circuit Training:** Repetition circuit training is appropriate for those sportspersons who have different levels of physical fitness. In fact, sportspersons who are more physically fit are able to do more number of repetitions of each exercise and sportspersons who are less physically fit are able to perform less number of repetitions of each exercise.
4. **Sports Specific or Running Circuit Training:** Such type of training can be done in a track of 200 m or 400 m. In this training, exercises are selected

© New Saraswati House (India) Private Limited

from any specific sports. Here, jogging or walking or slow running is done instead of rest in between exercises.

**Main Characteristics of Circuit Training Method**

1. Exercises are simple to learn and simple to execute.
2. Exercises are performed with medium resistance or with medium weight.
3. Number of repetitions is more.
4. Its aim is to develop endurance and strength.
5. It involves exercises of whole body parts.
6. It is given to sportspersons in the preparatory period for developing basic endurance and strength.
7. Training must be performed under gradually increasing strain.

**Some Examples of Circuit Training Exercises**

1. Running on the spot.
2. Throwing medicine ball and catching it again 15 to 20 times.
3. Splits squat jumps 15 to 20 times.
4. Carrying weight or partner on shoulder 30 to 50 metres.
5. Chin-ups of 5 to 10 times.
6. 50 metre run with sub-maximum speed.
7. Push-ups of 10 to 20 times.
8. Standing jumps of 10 to 20 times.
9. Sit-ups from supine position of 10 to 20 times.
10. Rope skipping of 1 to 2 minutes.
11. Dips of 15 to 20 times.
12. Half squats with weight.
13. Rope climbing, once or twice.
14. To perform bench press.
15. Bench press in sitting position.

Many exercises can be included in this training method such as dumb-bells, bar-bell, free-hand exercises, frog jumps, different weight training exercises, hurdling, etc. It is essential to note that muscles, which were involved in first exercise, should not be involved in the next exercise. It means that exercise of whole body parts should be given in alternate manner. There should be no pause or little pause after each exercise. In circuit training, there should be at least 10 stations. Exercise can be changed according to the requirement of the game and efficiency of the sportspersons.

**How to Increase the Load in Circuit Training**

Following points are important to increase the load in circuit training.

1. Number of repetitions can be increased per exercise.
2. Frequency can be increased.
3. Additional load can be increased.
4. Interval between exercises can be reduced.
5. Number of rounds can be increased.

© New Saraswati House (India) Private Limited

### Advantages of Circuit Training

1. Circuit training can be performed indoors or outdoors. In rainy season, this training can be done in rooms.
2. The equipment for exercises can be provided easily.
3. It is easy to learn. A trainee can learn to train himself.
4. Trainee is able to gain good result in a short period.
5. It is an interesting method of training.
6. It does not require long duration to perform exercises.
7. A number of athletes can do circuit training according to the stations at the same time.
8. The coach can easily watch and supervise the training.
9. Amount of training can be increased or decreased according to the ability of trainees.
10. All body parts can be exercised.
11. It helps in reducing injury risk.
12. It helps in burning extra calories.
13. It is helpful in disease prevention.

### Disadvantages of Circuit Training

1. It usually requires advance planning and lot of time and space, which can be a problem in a normal Gym.
2. It is effective for improving muscular endurance but it may have limited use in improving strength and power.
3. It can be highly fatiguing specially for the beginners. However, it can be helpful by using an effective work-rest ratio of at least 1:1.
4. Muscles can get toned up by doing circuit training but to gain muscles is impossible through circuit training.

## Importance of Circuit Training

1. **Maximum Results in Minimum Time.** Circuit training is a perfect workout for the individuals who have very busy schedule. In the training, you can set up as many as few stations as you like and then continue through the circuit until your time runs out. In fact, you can get maximum results regarding your fitness in minimum time with the help of this training.
2. **Ideal for Beginners.** Circuit training is ideal for beginners. It conditions the entire body and prepares you for advanced fitness programmes. It is easy to learn. A beginner can learn to train himself.
3. **Convenient.** It is convenient for each individual because you can do complete workout in very short periods. You can design it with little or no exercise equipment. It can be performed indoors and outdoors. Even in rainy season, it can be done in rooms.
4. **All the Body Parts Can be Exercised.** With the help of circuit training all the body parts can be exercised. It fact, at various stations different types of exercises can be arranged. Minor as well as major muscles of our body can be involved in these exercises.

© New Saraswati House (India) Private Limited

5. **Cardio and Strength Training can be Performed at the Same Time.** Circuit training offers the best means of both types of exercises. It consists of a mix of exercises that use different muscle groups. Its main objective is to develop endurance and strength simultaneously. It allows you to combine the high intensity cardio with heavy weight-lifting for comprehensive workout.
6. **Many Trainees can Perform Exercise at a Time.** Circuit training offers the best opportunity to do exercise to many trainees at the same time. If there are 12 stations then 12 trainees can do the exercise. They will not have to wait for their turn to next exercise.
7. **Amount of Training can be Changed.** The amount of training can be increased or decreased according to the ability of trainees.
8. **No Feeling of Boredom.** The trainees do not feel any boredom while doing this training. As a matter of fact, there are different exercises at different stations so there is no feeling of boredom. All the trainees feel fresh and energetic at every training session. The variety of exercises helps in keeping you interested and motivated.
9. **Burns Extra Calories.** By doing circuit training regularly extra calories can be burnt easily and the extra body weight can be controlled.

© New Saraswati House (India) Private Limited

## EXERCISES

### Objective Type/Multiple Choice Questions (Carrying 1 Mark)

**State True or False.**

1. Circuit training provides maximum results in minimum time. (True/False)
2. Circuit training is inconvenient for sportspersons. (True/False)
3. Circuit training is not ideal for beginners. (True/False)

**Choose the correct answer.**

1. Which one of the following training methods provides maximum results in minimum time?
   (a) Continuous training method (b) Fartlek training method
   (c) Circuit training method (d) Interval training method
2. Given below are two statements labelled Assertion (A) and Reason (R)
   A. **Assertion (A)**: Circuit Training is convenient for each individual.
   B. **Reason (R)**: Circuit training can be designed according to the needs of the individual.
   In the context of the above two statements which one of the following is correct?
   (a) Both (A) and (R) are true and (R) is the correct explanation of (A)
   (b) Both (A) and (R) are true, but (R) is not the correct explanation of (A)
   (c) (A) is true, but (R) is false.
   (d) (A) is false, but (R) is true.
3. Which is the training referred with "multiple stations"?
   (a) Interval training (b) Continuous training (c) Circuit Training (d) Fartlek training

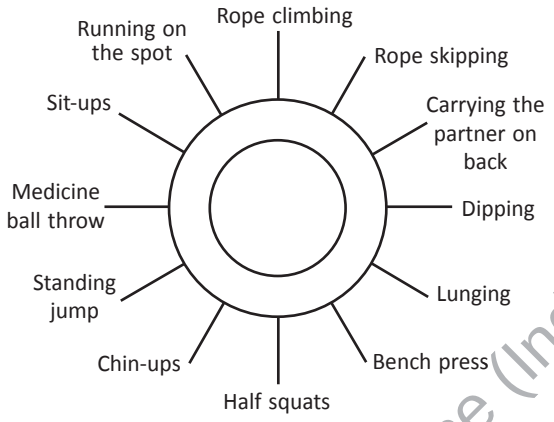
### Short Answer Questions (Carrying 3 Marks)

1. What do you mean by circuit training? Discuss its main characteristics?

2. What is circuit training? Discuss the advantages of circuit training?
3. Discuss the importance of circuit training in brief.
4. Discuss the various types of circuit training.

### Long Answer Questions (Carrying 5 Marks)

1. Write a detailed note on circuit training.
2. Define circuit training. Discuss the main characteristics and advantages of circuit training.
3. Elucidate the importance of circuit training in detail.
4. What is circuit training? Draw a diagram of 10 stations to improve general fitness. How can load be increased in circuit training? *[CBSE 2018]*
4. What is circuit training? Draw a diagram of circuit training with 12 stations and explain its importance in sports. *[AI 2020]*
5.




**A.** From the above picture, it is identified as ..... training method.
(a) Pace runs (b) Isometric (c) Isotonic (d) Circuit

**B.** This training method was developed by:
(a) Gosta Holmer (b) Emile Zetopack (c) Adamson and Morgan (d) Paavo Nurmi

**C.** This training method was developed in
(a) 1937 (b) 1942 (c) 1957 (d) 1964

**D.** This training method helps in improving the ..... .
(a) Speed and Strength (b) Speed and endurance
(c) Endurance and strength (d) Speed and flexibility

**E.** This training method is related to:
(a) USA (b) UK (c) Sweden (d) Finland

© New Saraswati House (India) Private Limited

## Objective Type/Multiple Choice Answers

### State True or False

**1.** True **2.** False **3.** False

### Correct Option

1. (c) Circuit training method
2. (a) Both (A) and (R) are true and (R) is the correct explanation of (A)
3. (c) Circuit Training

DANGER
PHOTOCOPYING
KILLS
THE BOOK

© New Saraswati House (India) Private Limited

For any query, email: marketing@saraswatihouse.com | visit our blog: beingcreativewithnshmarketing.blogspot.com | https://www.facebook.com/saraswatigroup/

New Saraswati House (India) Private Limited
**Head Office:** Second Floor, MGM Tower, 19 Ansari Road, Daryaganj
New Delhi-110 002, INDIA, • T +91-11-4355 6600 • F +91-11-4355 6688
E-mail: delhi@saraswatihouse.com, www.saraswatihouse.com

Price: ₹ 80.00
Code
80SE000542

No Tax on Books