Support Material
(2015-2016)

CLASS : XII

PHYSICAL EDUCATION

Under the Guidance of:

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Director (Education)

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Dr. Satish Kumar
OSD (Exam)
PREFACE

It gives me immense pleasure to present before you the subject-wise supporting material for the students of classes X, XI and XII, prepared by the teams of dedicated and industrious teachers from the Directorate of Education. The objective of this material is impart sufficient practice to the students and to enable them to think analytically and rationally.

I hope that the students will find this study material useful and it will help them achieve academic excellence. I also hope that teachers will guide and motivate the students to use this material in preparing for examinations.

I would like to appreciate the efforts of the teams of teachers and group leaders under the enlightened guidance of the Director (Education).

Wishing best of luck to all the students.

(PUNYA SALILA SRIVASTAVA)
PREFACE

The Directorate of Education prepares Support Material for different subjects indigenously. Every year, experienced and knowledgeable teachers revise and update the material for children.

Support material is a boon especially for those children who cannot purchase the costly but substandard ‘guides’ available in the market. Prepared in-house, the material is not only much better in quality, it is also provided to the students free of cost.

The material can serve as a very handy tool for revision. I call upon the teachers give their students sufficient practice in it.

I must share with the students that this material has the potential to enhance your performance and output, remarkably. So, please make it a habit to go through the text book first and then, practice from the Support Material.

I take this opportunity to thank all the learned teachers and HoSs who have contributed to the preparation/revision these works.

My best wishes!

(PADMINI SINGLA)
FOREWARD

I am delighted to present before you the latest issues of the support material for the students of classes X, XI and XII. During the last few years the content and quality of the support material has undergone subtle changes. Teams of subject experts have devoted their time, efforts and energy to prepare this material which facilitates the students while preparing for their exams. The material is updated according to the latest changes and improvements which have been carried out by the CBSE and NCERT.

I hope that our teachers will give sufficient practice to their students through this material which in turn will improve their creative and analytical skills.

I appreciate the hard work of all the teachers, group leaders and members of the Examination Branch whose efforts have materialized in the form of these books.

I wish you all the best.

Dr. Sunita S. Kaushik
Addl. Director of Education
(School and Exam)
# PHYSICAL EDUCATION (CODE 048) CLASS XII (2015-16)

## Curriculum

### THEORY

<table>
<thead>
<tr>
<th>Unit</th>
<th>Planning in Sports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Meaning &amp; Objectives of Planning</td>
</tr>
<tr>
<td></td>
<td>Various Committees &amp; Its Responsibilities</td>
</tr>
<tr>
<td></td>
<td>Tournament - Knock-Out, League or Round Robin &amp; Combination</td>
</tr>
<tr>
<td></td>
<td>Procedure to Draw Fixtures - Knock-Out (Bye &amp; Seeding) &amp; League (Staircase &amp; Cyclic)</td>
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<tr>
<td></td>
<td>Intramural &amp; Extramural - Meaning, Objectives &amp; Its Significance</td>
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<tr>
<td></td>
<td>Specific Sports Programme (Sports Day, Health Run, Run For Fun, Run For Specific Cause &amp; Run For Unity)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Adventure Sports &amp; Leadership Training</th>
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<tbody>
<tr>
<td></td>
<td>Meaning &amp; objectives of Adventure Sports</td>
</tr>
<tr>
<td></td>
<td>Types of activities - Camping, Rock Climbing, Tracking, River Rafting &amp; Mountaineering</td>
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<td>Material requirement &amp; safety measures</td>
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<td>Identification &amp; use of Natural Resources</td>
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<td>Conservation of surroundings</td>
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<td>Creating Leaders Through Physical Education</td>
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<tr>
<th>Unit</th>
<th>Sports &amp; Nutrition</th>
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<tbody>
<tr>
<td></td>
<td>Balanced Diet &amp; Nutrition: Macro &amp; Micro Nutrients</td>
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<tr>
<td></td>
<td>Nutritive &amp; Non-Nutritive Components of Diet</td>
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<td>Eating Disorders - Anorexia Nervosa &amp; Bulimia Effects of Diet On Performance</td>
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<td>Eating For Weight Control - A Healthy Weight, The Pitfalls Of Dieting, Food Intolerance &amp; Food Myths</td>
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<td>Sports nutrition (fluid &amp; meal intake, pre, during &amp; post competition)</td>
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<th>Postures</th>
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<tr>
<td></td>
<td>Concept of Correct Postures - Standing and Sitting</td>
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<td>Advantages of Correct Posture</td>
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<td>Causes of bad posture</td>
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<td>Common Postural Deformities - Knock Knee; Flat Foot; Round Shoulders; Lordosis, Kyphosis,</td>
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<td>Bow Legs and Scolioses</td>
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<td>Physical Activities as Corrective Measures</td>
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<th>Children &amp; Sports</th>
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<td>Motor development in children</td>
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Factors affecting motor development
Physical & Physiological benefits of exercise on children
Advantages & disadvantages of weight training & food supplement for children
Activities & quality of life.

Unit VI  Women & Sports
Sports participation of women in India
Special consideration (Menarch, Menstrual Disfunction, Pregnancy, Menopause)
Female Athletes Triad (Anemia, Oestoperosis & Amenoria)
Psychological aspects of women athlete
Sociological aspects of sports participation
Ideology

Unit VII  Test & Measurement in Sports
Measurement of Muscular Strength - Kraus Weber Test
Motor Fitness Test - AAPHER
Measurement of Cardio Vascular Fitness - Harvard Step Test/Rockport Test
Measurement of Flexibility - Sit & Reach Test
Rikli & Jones - Senior Citizen Fitness Test
1. Chair Stand Test for lower body strength
2. Arm Cur/ Test for upper body strength
3. Chair Sit & Reach Test for lower body flexibility
4. Back Scratch Test for upper body flexibility
5. Eight Foot Up & Go Test for agility
6. Six Minute Walk Test for Aerobic Endurance

Unit VIII  Physiology & Sports
Gender differences in physical & physiological parameters.
Physiological factor determining component of Physical Fitness
Effect of exercise on Cardio Vascular
System Effect of exercise on Respiratory System
Effect of exercise on Muscular System Physiological changes due to ageing
Role of physical activity maintaining functional fitness in aged population

Unit IX  Sports Medicine
Concept & definition
Aims & scope of sports medicine
Impact of surfaces & environment on athletes
Sports injuries: Classification, Causes & Prevention
Management of Injuries:
Soft Tissue Injuries:
(Abrasion, Contusion, Laceration, Incision, Sprain & Strain)
Bone & Joint Injuries:
(Dislocation, Fractures: Stress Fracture, Green Stick, Communed, Transverse Oblique & Impacted)

Unit X  Biomechanics & Sports
- Projectile & factors affecting Projectile Trajectory
- Angular & Linear Movements
- Introduction to Work, Power & Energy
- Friction
- Mechanical Analysis of Walking & Running

Unit XI  Psychology & Sports
- Understanding stress, anxiety & its management
- Coping Strategies
- Personality, its dimensions & types; Role of sports in personality development
- Motivation, its type & technique
- Self-esteem & Body Image
- Psychological benefits of exercise

Unit XII  Training in Sports
- Strength - Definition, types & methods of improving Strength - Isometric, Isotonic & Isokinetic
- Endurance - Definition, types & methods to develop Endurance - Continuous Training, Interval Training & Fartlek Training
- Speed - Definition, types & methods to develop Speed - Acceleration Run & Pace Run
- Flexibility - Definition, types & methods to improve flexibility
- Coordinative Abilities - Definition & types

Practical Max. Marks 30
01. Physical Fitness - AAHPER- 05 Marks
02. Athletics - Middle & Long Distance Runs & Throws*- 05 Marks
03. Health & Fitness Activities - Asanas/Swiss Ball/Plyometric/Aerobics (Any one) - 05 Marks
04. Skill of any one Team Game of choice from the given list*** - 05 Marks
05. Viva- 05 Marks
06. Record File** - 05 Marks

* The events being opted must be other than from those administered under Physical Fitness Test.

**1. Write benefits of Asanas, Swiss Ball & Plyometric
2. Measure Resting Heart Rate & Respiratory Rate of ten members from family or neighbourhood for three weeks & show graphical representation of the data.
3. Draw a neat diagram of the Field/Court of any one Game of choice. Write its history, Rules & Regulations, Terminologies & Important Tournaments.

*** Athletics, Basketball, Football, Handball, Hockey, Kho Kho & Volleyball
# Support Material Team

<table>
<thead>
<tr>
<th>Team Leader</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Nutan Duggal SPE; Zone-08</td>
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<tr>
<td>Mrs. Kumkum Aggarwal</td>
<td>GSKV Dhaka</td>
</tr>
<tr>
<td>Mr. Vinay</td>
<td>GBSS IARI PUSA</td>
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<tr>
<td>Mr. Rakesh Mohan Kothari</td>
<td>SBV Jafrabad</td>
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<tr>
<td>Mrs. Sunita Jassal</td>
<td>GGSSS Chabi Ganj</td>
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<tr>
<td>Mr. R.S. Rathí</td>
<td>RPVV Kishan Ganj</td>
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<tr>
<td>Mr. Sunil Bhardwaj</td>
<td>G. Co-ed SSS Safdarjung Encalve</td>
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UNIT : I

PLANNING IN SPORTS

Key Points:

- Meaning and objectives of planning.
- Various committees and its responsibilities.
- Tournament - Knock out, league (or round ribbon) and, combination.
- Procedure to draw fixtures: Knock-out (Bye & Seeding); League (Staircase and Cyclic)
- Intramurals and extramurals - Meaning, objectives and its significance.
- Specific sports Programme (Sports day; Run for fun, health run, run for specific cause and run for unity)

1.1 Meaning and objectives of planning:

“Planning is a way to systematize, direct and organise the events or competitions and extract the advantage and benefit of the available resources.”

“Planning is the process of making a sequence of work for a future line of action”

The success of Physical education programmes depends upon efficient staffing, food, direction, proper control, well super vision, good co-ordination and minimize the chances of lapses.

Objectives:

- To reduce undue pressure
- To provide proper co-ordination among the committees.
- To have good control over all the activities.
- To improve efficiency.
- To reduce the chances of mistakes.
- To increase the creativity.
- To enhance the sports performance.
- To protect existing facilities.
- Provide new facilities to meet demand.
- Helps in decision making.

### 1.2 Various committees and their responsibilities

- **Administrative director**
  - **Executive committee**
  - **Organising committee for games/sports**

- **Boarding and lodging committee**
  - **Publicity committee**

- **Reception committee**
  - **Decoration and ceremony committee**

- **Transportation committee**
  - **Grounds and equipment committee**

- **Committee for entertainment and refreshment**
  - **Committee on entries, fixtures and programmes**

- **Committee for officials**
  - **Announcement Committee**

- **First Aid Committee**
1.3 Tournament: A series of sports competitions, in which, a team finally wins and rest of the participating teams lose the matches. It depends on various factors i.e. - No. of participating teams, availability of grounds and equipments, No. of days and funds.

Importance of tournament

- The sportsman learns the discipline by playing tournaments.
- The sportsman meets other sportsman at a single platform.
- He learns ethical values such as honesty, fair play, respect for others.
- Tournaments provides recreation to all, i.e. organizers, spectators, students.

Type of tournament

A. Knock out: In this type of tournament, the team once defeated, gets eliminated from the tournament. Only the winning teams contest in the next rounds. Opportunities are given to the winning players/teams.

B. League: In single league tournament all participating teams compete once, with each other, whereas in double league, each team plays with every as in double league, each team plays with every other team twice, without any consideration of victory or defeat.

C. Combination Tournaments: Combination tournaments are organized in group or zonal matches. Whenever there is a large number of teams, combination tournaments facilitate the Physical Education Teachers, job. It gives them elbow room to try out new experiments.

There are mainly four types of combination tournaments:

(a) Knock out cum Knock out

(b) League cum league

(c) Knock out cum league

(d) League cum Knock out

D. Challenge Tournament: This type of tournament comes handy when there are one to one contests or there are two players on each side. One player challenges the other and the other player accepts the challenge. Games in which such tournaments are held are - Boxing, Tennis, Table Tennis, Badminton etc. Fixtures in such tournaments are decided according to :
(a) Ladder Method
(b) Physical Method
(c) Cobweb Method

1.4 PROCEDURE TO DRAW FIXTURES:-

A Knock-out Tournament:-

In this type of tournament, if a team is defeated once, it gets eliminated. Only the winners continue in the competition. It is the fastest method to know about the winner team in the tournament.

Seeding a Team:- The sorting of the teams and fitting them in the fixtures so that the stronger teams do not meet each other in earlier rounds is known as Seeding. This method is good if we know the real strong teams. The organizers should find out the real strong teams from the previous tournaments or old records before starting a new tournament.

Bye:- The advantage given to a team usually by drawing a lot, and exempting it from paying a match in the first round is known as Bye. These are given to a specific number of teams in the first round. The number of byes are decided by subtracting the number of teams from the next higher number which is in power of two's.

Bye Next Higher No-no of Team \([2^n \text{-no of teams}]\)

Methods of Preparing Fixtures for Knock-out Tournaments:-

1. Total number of teams participating in the tournament
2. Total number of matches to be played in the tournament

   Formula for calculating number of matches = n-1, where n is the total number of teams participating in the tournament.

3. Total number of rounds played in the tournament depends upon two things:-

   a. The number of teams playing in the tournament
   b. The higher nearest number from the total number of teams of power of two's = \(2^n\)
4. Method of determining the number of teams in upper half and lower half:
   a. If the number of teams is even, then equal number of teams will
      be divided in both halves i.e.- n/2, where n is the total number of
      teams.
   b. If the number of teams is odd, the following method is applied:
      Number of teams in upper half = (n+1)/2, where n = number of teams.
      Number of teams in lower half = (n-1)/2, where n = number of teams.

5. The number of byes is a knock-out tournament are decided by subtracting
   total number of teams from the next higher nearest number in power of
   two’s

1.4B Method for draw of fixture in league tournament:

(a) Stair-case Method: In stair-case method, the fixtures are made just like a
    ladder or a stair-case. In this method, no bye is given to any team and there
    is no problem of even or odd number of teams.

Example: Draw a fixture of 9 teams on league basis according to stair-case
method.

Solution:

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<th>Fixture</th>
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(b) Cyclic Method: In cyclic method, if the number of teams is even, the team
number 1 is fixed on the top of right hand side and other teams in ascending
order consecutively downward and then upward on the left side and rotate them
clockwise. If the number of teams is odd, then bye is fixed on top right side and
the rest procedure remains same. The number of rounds in case of even number
of teams will be \( n - 1 \), where \( n \) = number of teams. The number of rounds in case of odd number of teams will be \( n \), where \( n \) = number of teams.

**Example 1.** Draw a fixture of 6 teams on league basis according to cyclic method.

**Solution:** Total number of teams = 6

\[
\text{Total number of matches} = \frac{n(n-1)}{2} = \frac{6(6-1)}{2} = \frac{6 \times 5}{2} = \frac{30}{2} = 15
\]

Number of rounds = \( n-1 \) = 6-1 = 5 rounds.

**Fixtures**

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**1.5A INTRAMURALS AND EXTRAMURALS: MEANING, OBJECTIVES AND ITS SIGNIFICANCE**

**Meaning of Intramurals:**

Intramural is derived from the Latin word 'Intra' and 'muralis'. "Intra" means "within" and "Muralis" means 'Waif'. So we can say that the activities, which are performed within the walls or within the campus of an institution, are called "Intramurals".

**Objectives of Intramurals:**

1. To provide opportunity to every student to participate in Games and Sports
2. To develop Leadership Qualities among students
3. To develop Feeling of Cooperation
4. To provide Recreation
5. To develop the Feeling of Sportsmanship
6. To provide opportunity to learn a variety of games and Skills
7. To provide opportunity to get Experience of Organisation of Competitions
8. To find out talented Sportpersons
9. To provide opportunity to Develop personality

B EXTRAMURALS:-

Extramural is derived from the latin words “Extra” and “Waif”. So, we can say that the activities which are performed outside the walls of an institution or school, are known as “extramurals”.

Objectives of Extramurals:-

1. To provide Experience to Students
2. To improve the Standard of Sports
3. To broaden the Base of Sports
4. To develop Sportsmanship and Fraternity
5. To provide knowledge of New Rules and Advanced Techniques

1.6 SPECIFIC SPORTS PROGRAMME

Sports and games programmes are arranged in the world as well as in our country to promote the games and sports for a specific cause. Every country in the world has some or other cause for promoting specific sports programmes. The programmes motivate and create the feeling to take part in these sports programmes. People become health-conscious and try to remain fit and stay healthy for as long as possible. These specific sports programmes are usually organized by the federations, state government, NGO etc. to create health consciousness among the people and take part in health-related sports programmes.

More and more people of all age groups should take part in such sports programmes. The various important specific programmes are:-

1. SPORTS DAY–A School–Annual Sports Day
2. NATIONAL SPORTS DAY
3. HEALTH RUN
4. RUN FOR FUN
4. RUN FOR UNITY
5. RUN FOR AWARENESS
6. RUN FOR SPECIFIC CAUSE

VERY SHORT ANSWER TYPE QUESTION (1 MARK EACH)

1Q. What is knock-out tournament?
Ans. In knock-out tournament a team gets eliminated at the very first defeat. Only winning teams keep on continuing.

2Q. Explain league tournament?
Ans. In this system of tournament each team plays with the rest of the teams once if the tournament is single league. In double league every team plays twice with the rest of the teams.

3Q. What is ‘Bye’?
Ans. It is a privilege given to a team to play directly in the second round. While drawing fixtures on knock-out basis if the no. of participating teams is not being the power of two i.e., - 22, 23, 24 .... and are odd in numbers i.e., 5, 7, 9, 11, 12 .........., then bye has to be given to a specific no. of teams/players. A team which is given ‘Bye’ will not play in the first round.

4Q. Define Intramurals?
Ans. Intramurals = Intra + Murals = Inside + wall within i.e., an activity performed within the walls i.e. within an institution/school/college is called intramurals.

5Q. Define extramurals?
Ans. Extramurals = Extra + Murals = Outside + wall. Extramurals means outside the walls or the campus i.e. when more schools or institutions join together to organise/to participate a competition. It is also known as Extramurals competition.

6Q. What is health run?
Ans. It is organised by sports or health department to raise funds for charity and spread awareness about health and fitness. People of any age can take part in it.
7Q. What is run for Fun?

Ans. It is organised to spread awareness about health and fitness. There is fun and frolic and no competition.

**SHORT ANSWER TYPE QUESTION (80 TO 90 WORDS) (3 MARKS EACH)**

Q1. Write the advantages & disadvantages of knock-out tournaments.

Ans. **Advantages of Knock-out Tournaments**

1. Knock-out tournaments are less expensive.
2. It helps in developing the standard of the game, as each team tries to perform at their best to avoid defeat.
3. With in shortest possible time, tournament can be finished.
4. No. of officials required also get reduced to organise such tournaments

**Disadvantages of Knock-out Tournaments**

1. There are chances of even good enough teams getting eliminated in 1st and 2nd round itself.
2. There are chances of weak teams making it to final stages.
3. Viewers interest in the final match may get reduced.

*What is the league tournament ? Write its type of league tournament. Explain its advantages & distances of league tournaments

Q2. Define league. Explain its types. Write its advantage & disadvantage of league tournament?

Ans. *League or Round Robin Tournament

In this system, each team plays with the rest of the teams once if the tournament is single league. In case of double league every team plays with the rest of the team twice. Victory or defeat does not matter.

**Type of League Tournaments**

1. Single League Tournament
2. Double League Tournament
• Formula for no. of matches in single league \( \frac{N(N-1)}{2} \) (N stands for no. of participating teams) Eg. For 12 Teams

\[ \frac{12(12-1)}{2} = \frac{12\times11}{2} = 6\times11 = 66 \]

For Double league Tournament

\( N(N-1) \)

Eg. 8(8-1) = 8 \times 7 = 56

Advantages of League Tournament

1. Only the strong teams will win.
2. Teams will get enough opportunity to show their performance.
3. Games and sports get more opportunity of publicity.
4. Officials find it easy to choose a team.
5. A team does not have to defeat the other team to play next match.
6. There are no. of opportunity to improve one's own game and performance.
7. Viewers get enough opportunity to see a no. of games.

Disadvantages of League Tournament

1. It takes more time.
2. It is more expensive.
3. Much bigger arrangement has to be made.
4. Repeated defeat demoralise the team and reduces recreation of the spectators.

Q3. Write the procedure of fixtures in league tournaments?

Ans. Procedure of Fixtures in League Tournaments

1. Cyclic Method
2. Staircase Method
3. Tabular Method
1. **Cyclic Method**

A fixture of 4 teams

\[
N = 4
\]

Total no. of matches

\[
\frac{N(N-1)}{2} = \frac{4(4 - 1)}{2} = \frac{4 \times 3}{2} = 6 \text{ matches}
\]

No of rounds = (N-1) = 4-1 = 3

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</table>

2. **Stair Case Method**

6 team

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1-2 \\
1-3 & 2-3 \\
1-4 & 2-4 & 3-4 \\
1-5 & 2-5 & 3-5 & 4-5 \\
1-6 & 2-6 & 3-6 & 4-6 & 5-6 \\
\end{array}
\]

3. **Tabular Method**

Q4. What are the objectives of Extramurals?

**Ans.**

1. **To improve the standard of sports** - By taking part in extra murals the students get gradually more and more technically and tactically equipped.

2. **Provides experience to students** - Extramurals give many opportunities to students to take part in different tournaments and gain experience.
3. **To develop sportsmanship** - All the players play together, eat together, live together, it develops the sportsmanship among the players.

4. **To provide the knowledge of new rules and regulations and advanced techniques.** Through extra murals players get extra knowledge about related activities by meeting new teams and players.

Q5. Define Tournament? Write the types of tournaments?

A tournament is a competition involving a relatively large number of competitors, all participating in a sport or game.

**Types of Tournaments**

1. Knock-out Tournament
2. League or Round Robin Tournament
3. Combination Tournament
4. Challenge Tournament

**LONG ANSWER TYPE QUESTION (150 TO 200 WORDS) (5 MARKS EACH)**

Q1. Explain the principles of Intramurals.

Ans. **Local Circumstances**

1. It means the favourite games of the school and the area in which the school is located. Availability of playground and other facilities. Which are suitable for activities & students.

2. **Good quality sports equipments and facilities**

   In order to organise intramurals the sports equipments should be very high quality to avoid the injuries.

3. **Interest**

   The selection of activities should be on the basis of the interest of the students so that the students can enjoy it and it will increase the number of participation in the intramurals.
To maintain the interest, activities should be selected on the basis of students, facilities & society.

4 **Budget**

Organising intramurals is based on the budget of the school. In case there is sufficient budget it can be organized on a large scale otherwise we can organise it within the budget.

5 **Time & climatic condition**

It is also a very important factor. It should be organized in evening or in the holidays so that the teaching classes are not disturbed.

6 **Mass participation**

In such competitions winning should not be over emphasized because mass participation is more important. We should see that every student take part and enjoy the sports activities.

7 **Medical examination**

Medical examination of all the participants should be compulsory. Students having serious health problem an injury should be prevented from participating.

8 **Classification of students**

On the basis of age, sex, ability, weight, height and strengths of class, students should be classified to maintain the interest in the tournament.

Q2. Explain the objectives of planning.

Ans. There are various objectives of planning which are-

1 **To reduce unnecessary pressure of immediacy** - In hurry a work can not be performed efficiently and smoothly. So to reduce the pressure of immediacy or urgency are the main objective of planning.

2 **To keep control over all the activities** - Planning helps is keeping good control in organizing a tournament as planning and control are connected with each other.

3 **To facilitate proper Co-ordination** - This objective of planning is related to facilitate proper coordination among the various members of committees, formed for to organise the competition.
4 **To reduce the chances of mistake** - A proper planning reduces the chances of mistake and oversights. Planning help to do work in systematic way.

5 **To increase the efficiency** - With a help of a proper planning the sports officials become more efficient. They perform their duties efficiently and effectively because planning provide chance to study their work.

6 **To increase the creativity** - To increase the creativity is another significant objective of planning. As a matter of fact, a proper planning increases the creativity among the officials, coaches and physical education teachers. In fact planning helps innovative and creative thinking because many new ideas come to the mind of officials when they make on a plan.

7 **To enhance the sports performance** - Without proper planning it is not possible to improve the performance of a sports person. In fact, training of sports activity of players are useless if it is not well planned.

Q4. Write the meaning of Intramural & write its principles

**Ans.** The word 'intramural' means the activity performed within the walls i.e. within the campus of an institute. Such activities are basically organised by school, colleges or other institutes for their students only. Students enjoy such activities the most.

**Principles of Intramural**

1. **Interest** - Activities should be of the interest of students & related society.
2. **Facilities & Infrastructure** available like playgrounds, equipments, gymnasium.
3. **Cooperation & necessary help** that can be expected from the colleagues for the smooth conduct of game.
4. **Budgets** - Sufficient budget should be there for its successful organisation.
5. **Time** - Availability of time & students for conducting the events.
6. **Winning** - Focus should be on mass participation not on winning or loosing
7. **Medical Examination** - Medical examination for all the participants should be compulsory to avoid injuries.

8. **Classification of students** - On the basis of age, ability, weight, or class, sex, students should be classified.

9. Geographical & climatic condition should be taken into consideration.

Q5. Define extramurals. Writes its objectives & principles

Ans. Here extra means outside and murals means walls i.e. outside the wall or campus. When one more school or institution joins together to organise the games or sports is called extramural activity. It is also known as interschool competition.

**Objectives of Extramurals**

1. To improve the standard of sports
2. To provide opportunities to show their skills in various sports activities.
3. To develop experience to students
4. To broadens the base of the sports
5. To provide the knowledge of new rules and regulations and advanced techniques.
6. To develop sportsmanship and fraternity.

**Principles of Extramurals**

1. Willing Participation - Students Should not be forced to participate.
2. Medical Examination Prior to Participation - Medical examination should be compulsory for all the participants.
3. Arrangement of efficient officials - efficient officials should be arranged well in advanced for smooth organisation.
4. Extramural programmes should be fixed according to the convenience of the players.
5. Winning should not be over emphasized.
6. Good Quality of sports Equipments should be used.
Q6. Explain the meaning of specific sports programme? Write its contribution for society.

Ans. Specific sports programs are those programs of sports which are often not related to the competition. These programs are designed with multiple objectives with their focus on the well being of an individual. The aims of programme is to create awareness among the common people regarding unity & integrity, prevention & protection against various diseases’ etc.

**Specific Sports Programmes**

(i) **Sports Day**

Sports day is organised in the school once in the year so that the all round development of children could be done. Various physical and recreation activities are conducted on sports day. It is organised by almost each and every school. On sports day every child gets ample opportunities to take part in activity of their choice. Due to these days most of students get experience as organiser as well as administrator. Sports day also provide opportunity to select talent for future.

(ii) **Health Run**

These programmes are organised by health and sports department to raise the standards of health and also to raise funds for charity. Registration of participants is done in advance and day & time is fixed. There is no age bar. People of any age can take part. There is no competition. These provide significant health benefits. But pre cautionary measures must be taken before participating i.e.: proper sports kit, Health status of individual.

(iii) **Run for Fun**

This is to create awareness among people to keep fit and healthy. There is fun and frolic while on the run there is no competition. It is commonly organised for arranging funds for charity. It can be perform it in different customs, different age group, children like adults, teenage etc.

(iv) **Run for Unity**

This is to inculcate peace and harmony among the people of different religion or faith. Its purpose may be either National or International brotherhood. Many people from corporate world, film stars and marathon racers from abroad take
part. First three position holders get cash awards. It can either be a long distance race or a relay. In relay race, every participant runs a specific distance and gives opportunity to the teammate to participate. So, these runs bring sense of togetherness among people.

**Run for Awareness**

Run for awareness is organised to make the masses aware of present problems or any health problem of serious nature like AIDS, SWINE FLU etc. Such ‘RUNS’ lay stress to remove or prevent the deadly diseases. Its purpose it to raise funds for charity. Participants get a T-shirt after finishing the run. First three position holders get prize. There are different age wise categories.

Q7. Prepare the fixture in knock out & league tournaments.

**Ans. Important Points of Knock-out Tournaments**

1. Number of all teams taking part.
2. Number of total byes.
3. The number of total teams in each half or quarter.
4. The number of byes in each half or quarter.
5. Number of total rounds.
6. Total no. of matches = Total no. of teams - 1.

**Method of preparing fixture in Knock-out Tournament**

Total no. of matches to be played, can be easily calculated by subtracting 1 (one) from total no. of participating teams i.e. If there are 12 teams (12 - 1 = 11) i.e. 11 matches will be organised.

Team can be easily divided into 2 halves if the total no. of teams is power of 2 i.e.- 2, 4, 8, 16, 32, 64, 128. etc.

If the no. of teams, is different from the above pattern i.e.- 3, 5, 6, 7, 9, 10, etc. byes will have to given. Bye is a dummy team that does not play in the first round.
**Formula to give bye** -

**Example I** - Total no. of teams = 7, total no. of matches = no. of team - 1

Next higher no. which is power of 2 = 8

So, the no. of bye will be = 8 - 7 = 1 [higher power of 2 - no. of teams]

To divide the teams in two halves

Upper half

\[
\frac{\text{Total no. of teams} + 1}{2} = \frac{N + 1}{2}
\]

(LN stands for the no. of teams)

Lower half

\[
\frac{N - 1}{2}
\]

**Example II**

Total No. of teams (N) = 11

Upper half

\[
\frac{N+1}{2} = \frac{11+1}{2} = \frac{12}{2} = 6 \text{ teams}
\]

Lower half

\[
\frac{N-1}{2} = \frac{11-1}{2} = \frac{10}{2} = 5 \text{ teams}
\]

No. of byes to be given-

Total no. of teams i.e. 11 is subtracted from net power of 2 no. i.e. = 16

= 16 - 11 = 5 (5 byes will be given)
Method of fixing byes

FIXTURE

Last year runner-up

1 IInd Bye
2
3
4
5

Last year IInd runner-up

6 IVth Bye

Last year IIIrd runner-up

7 IIIrd Bye
8
9

10 Vth Bye

Last year winner

11 Ist Bye

Winner

Winner

Winner

Winner

Winner

Winner

Winner

Winner

Winner
UNIT - II

ADVENTURE SPORTS AND LEADERSHIP TRAINING

Key Points:

- Meaning and Objectives of Adventure Sports
- Types of Activities-Camping, Rock Climbing, Tracking, River Rafting & Mountaineering
- Material Requirement and Safety Measures
- Identification and use of Natural Resources
- Conservation of Surroundings
- Creating Leaders through Physical Education

2.1 Adventure Sports:- Adventurous Sports are such type of Sports which involve Extraordinary speed, height, physical exertion and surprising stunts.

Aim

“The main Aim of the Adventure Sports is to provide a carefully Planned stimulating environment which will help each individual and excellent foundation for creative learning and independence”

Objectives

1. Thrill, excitement and fun
2. Exposure to nature
3 Self-assessment
4 Overcome fears and develop self-confidence
5 Enhancement of decision making power
6 Channalization of Energy
7 Stress booster
8 Information and knowledge enhancement
9 Development of balanced and positive attitude towards life
10 Build concentration
11 Encouragement to social relationship and team work
12 Develop motor and cognitive skills, creative learning
13 Inculcate the values among the children.

2.2 Types of Adventure Sports

- Water Sports
  - Surfing
  - Extreme canoeing
  - Cliff diving
  - Barefoot water skiing
  - Windsurfing
  - Scuba diving
  - Rowing
  - Water Polo

- Mountain Sports
  - Mountaineering
  - Trekking
  - Mountain biking & cycling
  - Rock climbing

- Plains Sports
  - Camping
  - Wildlife Safari
  - Caving
  - Zorbing ball

- Winter Sports
  - Ice climbing
  - Ice Boating
  - Snow Boarding
  - Skiing
  - Snowmobiling
  - Helisking
  - Mountaineering
  - Sketting
  - Bobsledding

- Air Sports
  - Para-glding
  - Hotair Ballooning
  - Zip-lining
  - Bungee jumping
  - Base Jumping
  - Sky diving
  - Hang gliding
  - Sky surfing

Types of Activities
2.3 Material required for Adventure Sports

- First Aid Box
- Rucksack Bag
- Tools for Adventure Sports according to the activity
- Sleeping bag
- Torch
- Foot wears as per activity
  - Clothes and personal care products according to the weather
  - Food items
  - Insect repellent
  - Knife
  - Rope
  - Windcheater
  - Map & compass
  - Sun cream lotions

Safety measures

- Basic knowledge of First aid for emergency
- Knowledge about the weather, Geographical condition & Hazards
- Drink sufficient water and liquids to avoid dehydration
- Use proper shoes or Boots according to the adventure activity
- Knowledge about the plants and animals in related areas
- Use multi-pocket carry bags for multi-purpose tasks
- Physical fitness
- Never consume alcohol
- Never Raft and track in the dark
- Notify others while raft or track
- Careful diet
- Avoid sickness or injury
- Be alert for each and every condition
- Prepare yourself
- Relax in every movement

Identification and use of Natural Resources

Resources

Natural Resources
- Ubiquitous (Sunlight & air)
- Local (Oil)
- Biotic (Petrol)
- Abiotic (Metals)
- Renewable (Sunlight, air & water)
- Non-renewable (Uranium, Phosil fuels)

Man made Resources

Conservation of Surroundings:-

“Environment conservation refers to the practice of protecting the environment, on individual, Governmental levels.”

“Conservation of Environment simply means the sustainable use as well as the management of natural resources-Wild life, Water, Air, Energy, Earth deposits etc.”

The aim of Conservation of Environment is the balanced and appropriate use of Natural resources so that neither the Environment is effected nor the coming generation is deprived of them.

Creating the Leaders through Physical Education:-

Leaders are the individuals that help and guide followers to achieve personal as well as group goals
Leadership:-

Leadership is the quality of a person to lead others in a family, society, tribe, group or country.

**Types of Leadership**

- **Bartlett**
  - Individual Leaders
  - Dominant Leaders
  - Pursuasive Leaders

- **Martin Conway**
  - Group Builders
  - Group Manipulators
  - Group Originators
  - Group representatives

- **Sargent**
  - Headman
  - Executive Leaders
  - Religious Leaders
  - Expert Leaders
  - Agitators
  - Symbolic Leaders

- **Physical Education**
  - Teacher Leadership
  - Student Leadership

**Qualities of a leader**

- Personal Prestige
- Physically strong
- Fearlessness
- Good Appearance
- Intelligence
- Awareness
- Broad Mindedness
- Firm determination
- Courage
- Cooperative Nature
- Good Organiser
- Professional Knowledge
Developing leadership qualities Through Physical Education

- Health & Energy
- Determination and Assertiveness
- Well Developed components of Physical Fitness
- Dedication and Discipline
- Truth
- Integrity
- Credit & deserving
- Fair and Persistent
- Good social and communication skills
- Inspiration, Ambitious & Motivation
- Logical and Decisive
- Confidence
- Flexibility
- Intelligent
- Innovative, Futuristic & Creative
- Endurance & Tolerance
- Judgement Skill

**VERY SHORT ANSWER TYPE QUESTION (1 MARK EACH)**

Q.1 Define adventure sports?

Ans. Adventure sports are defined as activities where there is a high degree of risk to the participant. These are thrilling and adventurous. These sports requires good physical fitness eg. trekking mountaineering.

Q.2 Name any four adventurous sports?

Ans. (1) Trekking
(2) Mountaineering
(3) River rafting
(4) Rock climbing
Q.3 What do you mean by camping?
Ans. “Camping describes” - Living away from home for few days with friends and colleagues is called camping, “a range of activities such as climbing, fishing, Hill walking, mountain biking, swimming etc. Various types of camps are NCC camp, NSS camp sports camp etc.
Q.4 What is trekking?
Ans. Trekking is a long adventurous journey undertaken on foot in areas where common means of transport are generally not available.
Q.5 Name specific equipments which are used during river rafting?
Ans. - Bathing suit, River shoes, Waterproof sunblock.
- Water resistance bag.
Q.6 Name any two injuries of mountaineering?
Ans. - Finger injuries
- Shoulder injuries
Q.7 What are renewable resources?
Ans. Renewable resources can be recovered naturally. Some of the renewable resources are - sunlight, air etc.
Q.8 What are non-renewable resources?
Ans. Non-renewable resources either form slowly or do not naturally form in the environment eg. coal, petroleum etc.
Q.9 What is conservation of environment?
Ans. Conservation is the sustainable use and management of natural resources including wildlife, water, air and earth deposits.
Q.10 Define leadership?
Ans. Leadership is a process of social influence in which one person gets the support of others to accomplish a common task.
Q11. Mention any three objectives of adventure sports?

Ans. 1, To develop self confidence

2, To develop mental and physical fitness

3, To provide exhilaration, amusement and excitement.

**SHORT ANSWER TYPE QUESTION [80 TO 90 WORDS] - (3 MARKS EACH)**

1Q. Explain about rock climbing in detail?

Ans. Rock climbing is an activity in which participants climb-up, down or across natural rock formations or artificial rock walls. It is a physically and mentally demanding sport. It needs strong will power.

**Common Equipment**

- Climbing rope
- Carbines
- Belay Device
- Specialized climbing helmet

**Common injuries**

- Cuts, burns, and bruises
- Injury to fingers, elbows and shoulders

**Safety measures**

- Take lessons from a professional trainer.
- Choose a safe mountain
- Always wear safety equipments
- Make sure your foot hold and hand holds are secure.

2Q. Discuss about mountaineering in detail?

“Mountaineering is a technical sports that requires very high level of skill, practice & the knowledge of implementation of various techniques.”
Ans. Mountaineering is a sport of hiking, skiing and climbing mountains

**List of common equipments.**

- Rope, cord and webbing
- Carabiners
- Harnesses
- Belay devices
- Rappel devices
- Figure eight
- Rescue eight
- Rescue eight
- Miscellaneous

**Common Injuries**

40% occurred in the fingers
16% in the shoulders
12% in the elbows
5% in the knees
5% in the back

**Safety Measures**

1. Always check Harnesses
2. Always check knots
3. Always wear a climbing helmet
4. Always check the rope and belay device
5. Always use a long rope
6. Always be alert & be in touch
7. Follow the signage
8. Always properly clip the rope
9. Always use safe anchors

3Q. Explain the material requirement and safety measures for trekking?

Ans. Material requirement -
1. Light weight thermal tops, jacket or pullover, gloves, shoes etc.
2. Personal gears - Inner wears & personal clothing
3. Trekking bag
4. Sun hat & sun glasses with UV protection
5. Sleeping bag
6. Head lamp
7. Basic first-aid
8. Ice axe - if snow trek
9. Water proof shell trousers

Safety Measures
1. It is preferable to have a medical check-up while planning a trekking trip
2. Take a first-aid box with you
3. Always wear proper trekking kits
4. Careful diet
5. Measured trekking
6. Limited luggage
7. Walk slowly with group.
8. Carry a Whistle
LONG ANSWER TYPE QUESTION [150 TO 200 WORDS] -
(5 MARKS EACH)

1.Q Discuss the objectives of adventure sports in detail.

Ans. Objectives of Adventure sports are:

1. **To develop self confidence** - By overcoming the fear and experiencing the thrill, one can develop self confidence.

2. **To build the concentration** - In these sports a person has to be very alert and attentive all the time. It develop the concentration.

3. **To develop mental and physical fitness** - These sport help in developing the mental and physical fitness. Such sports involves fitness skills like jumping, climbing, swimming etc.

4. **To improve social relations** - During participation in adventure sports qualities like sympathy co-operation, helpfulness, adjustment, group cohension, unity, sincerity, patience, fraternity are developed.

5. **To have bonding with nature** - Most of the adventure sports are outdoor activities which give enough opportunities to experience nature. Which develops a bonding with nature.

6. **To face the challenges against nature** - These sports enhance one’s capacity to deal odd situations with courage and determination.

7. **Proper use of abundant energy** - Adventure sports provide the participant a positive and healthy channelization of their abound and energy.

8. **To provide amusement and excitement** - It is a vital objective of adventure sports to provide amusement and excitement.

9. **To encourage creativity** - These sports allow and encourage creativity of an individual.

10. **Inculcate adventure** - Motivate to accept adventure & attempt the sports with sportsmanship.

2.Q Explain the leadership qualities in physical education.

Ans. Leadership qualities in physical education are-
1 **Sound Communication** - Ability to describe what you want to do is extremely important. It you can not relate your vision to your team, you will not be able to achieve your goal.

2 **Confidence** - As a leader, by staying calm and confident, you will help the team to have the same feeling of confidence.

3 **Sense of Human** - Through your sense of human you can convert a tough situation into a light one.

4 **Commitment** - It is important to show your commitment not only to the week in hand, but also to your promises. This way you can create a reputation of a fair leader.

5 **Positive Attitude** - To keep your team motivated, your should always have a positive attitude.

6 **Ability to Inspire** - A leader should have the ability to inspire his team to achieve its set goal.

7 **Energetic** - To be energetic is necessary for a leader in the field of physical education. Infact it is the basic requirement.

8 **Decisiveness** - A leader should be able to take a quick decision. Without wasting time in odd situation.

9 **Technically skilled** - A leader in physical education should be technically skilled. He should be expert of his discipline.

10 **Intelligent** - A leader should be intelligent to find a possible solution of a complex problem.

11 **Awareness** - A leader should be able to perceive the feeling & need of group.
UNIT - 3

SPORTS AND NUTRITION

Key Points :

- Balanced Diet and Nutrition : Macro and Micro Nutrients.
- Nutritive and Non-nutritive components of diet.
- Eating disorders - Anorexia Narvosa and Bulimia.
- Effects of Diet on performance
- Eating for weight control - A healthy weight, the Pitfall of dieting, Food Intolerance and Food Myths.
- Sports Nutritrition (Fluid & Meal in take, pre, during and post Competition).

3.1 A. **Balanced Diet** :- A complete food, a diet contains adequate amounts of all the necessary nutrients required for proper growth & maintenance of body.

**B. Nutrition** :- It is the process of obtaining & consuming food or breaking down food & substances taken in by the mouth to use for energy in the body.

**C. Nutrients** :- The energetic food in our diet consists of various types of essential chemicals for our body termed as nutrients:- e.g. Protein, fat, carbohydrates, vitamins & minerals.

**Components of Diet (Nutrients)**

<table>
<thead>
<tr>
<th>Macro</th>
<th>Micro</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Carbohydrates</td>
<td>(iv) Vitamins</td>
</tr>
<tr>
<td>(ii) Fats</td>
<td>(v) Minerals</td>
</tr>
<tr>
<td>(iii) Proteins</td>
<td></td>
</tr>
</tbody>
</table>
3.2 Non-Nutritive Components of Diet

Non-Nutritive

(i) Fiber or Roughage
(ii) Water
(iii) Colour Compound
(iv) Flavour compound
(v) Plant Compound

3.3 Eating Disorders - (i) Anorexia Nervosa & Bulimia.

A. Anorexia Nervosa - It is a serious & potentially life threatening mental illness. The eating disorder is characterized by self-starvation & excessive weight loss. It is caused by genetic predisposition & a combination of environmental, social & cultural factors.

B. Bulimia Nervisa :- It in eating Disorder characterised by recurrent binge eating followed by compensatory behaviour such as purging or consuming large amount of food in a short amount of time followed by frantic afforts to avoid gaining weight. By Self induced vomiting, excessive use of laxatives, enemas or diuretics or excessive exercise.

Treatment :- Psychological Therapy, medication, Hospital treatment Balanced Diet Ealing Roughafe Education etc.

3.4 Effects of Diet on performance.

Good diet and nutrition can improve spenting performance. Any diet which has all constituents of food, necessary for the maintenance and growth of body in sufficient amount is important for all people busy in simple work or in highly competitive sports.

3.5 Eating for weight control :-

(i) A healthy weight is a weight that lowers your risk for health problems, Generally body mass index (BMI) and waist size are good ways to achieve healthy weight. Methods to calculate BMI = Weight in Kg/(Height in m)^2

<table>
<thead>
<tr>
<th>Category</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under weight</td>
<td>&lt;18.5</td>
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</tbody>
</table>
### Category BMI

<table>
<thead>
<tr>
<th>Category</th>
<th>BMI</th>
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</thead>
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<tr>
<td>Normal Weight</td>
<td>18.5 - 24.9</td>
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<tr>
<td>Over Weight</td>
<td>25 - 29.9</td>
</tr>
<tr>
<td>Obesity Class I</td>
<td>30 - 34.9</td>
</tr>
<tr>
<td>Obesity Class II</td>
<td>35 - 39.9</td>
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<tr>
<td>Obesity Class III</td>
<td>35 - 39.9</td>
</tr>
<tr>
<td></td>
<td>&gt; 40</td>
</tr>
</tbody>
</table>

**Eating for weight control** :- Factors to control body weight

- Balanced diet
- Drinks lots of water
- Eating lot of fibrous food
- Regular Medical Checkup
- Avoid Fats
- Medicine only by doctors advice
- Physical Activity
- Avoid Drinking
- Avoid junk food
- Meals in small shifts
- Follow Hygienic Habits
- Do not Dieting
- Never try slimming pills
- Avoid over eating
- Balancing the intakes of calories and expenditure of calories.

### B. PITFALL OF DIETING

An individual who is overweight wants to reduce weight they starve for reducing weight many times skip meals to lose weight, sometimes take slimming pills.

- Extreme Reduction of Calories.
• Restriction on some nutrients
• Skipping meals
• Intake of calories through drinking
• Under estimating the calories.
• Intake of tabled foods.
• Not preferring physical activities.
• low energy diet.
• Taking less liquids
• Starving

C. Food Intolerance

Food intolerance is that when a person has difficulty in digesting a particular food.

Symptoms: Nausea, Vomiting, Pain in joints, headache and rashes on skin, Diarrhoea, sweating, palpitations, burning sensations on the skin stomach.

Causes:

Absence of activity of enzymes responsible for breaking down the food elements. These are usually innate sometimes diet related or due to illness.

Management:

Change in diet causing reaction some therapies like fructose intolerance therapy, lactose intolerance therapy, lisamine intolerance therapy can be applied.

D. Food Myths/Dieting Myths

(i) Myth :- Low fat or No fat diet are good.

Fact :- Body needs fats for energy, tissue repair and to transport vitamin A.D, E.K. Just cut down on salivated fat eating un saturated fats.

(ii) Myth Crash :- Dieting or Fasting may loose weight.

Fact :- It may be true in short term but ultimately it hinder weight loss. Loosing over the long term burns off fat whereas crash dieting or fasting not only removes fat but who leans muscles.
(iii) Myth :- Food eaten late night is more fattening.
    Fact :- It doesn't make much change.

(iv) Myth :- Low fat milk has less calcium that full fat milk.
    Fact :- Skimmed and semi skimmed actually have more calcium because it is in watery part and not in creamy part of milk.

(v) Myth :- Vegetarian cannot build muscles.
    Fact :- Vegetarian can built muscles as meat eaters by getting their proteins from vegetables such as cheese nuts pulses. Etc.

(vi) Myth :- Healthy food is expensive.
    Fact :- Tinned, stored, packed food is expensive. Whereas local & seasonal food is inexpensive.

3.6 Sports Nutrition (Fluid & Meal in take, pre, during the post Competition)

Eating Diet before exercise:

1. The meal should be taken atleast three to four hours and snacks atleast one to two hours before exercise, to give us time for digestion.

2. The diet should inlude starches such as cereal, bread and fruit, to give us a slow, steady release of energy.

3. We should avoid simple sugars because they increase insulin leve, which in turn reduces our blood glucose and make us fee tired.

4. To avoid dehydration, include plenty of fluids in the diet.

5. As fat and protein take a longer time to digest, avoid such diets before exercise.

Eathing Diet during exercise:

1. Take small sips of water and other fluids even if you do not feel thirsty.

2. Drinking liquid glucose to save your own limited stores of glycogen.

Eathing Diet after exercise:

1. Drink lots of water and other fluids to replace any loss of fluid.
2. The food should be rich in carbohydrate within an hour of exercising even if we do not feel hungry, to restore glycogen stores quickly.

**VERY SHORT ANSWER TYPE QUESTION**

(I MARK EACH)

Q1. Mention the types of carbohydrate?

Ans. Two types Simple & Complex.

Q2. List down simple types of carbohydrates?

Ans. Glucose, Galactose, Fructose, Maltose, Sucrose lactose.

Q3. State complex carbohydrates types?

Ans. Starch, Glycogen, Dextine, Cellulose are the types of complex carbohydrates.

Q4. How many amino acids are found in proteins?

Ans. 23 amino acids and 9 are essential for us.

Q5. State two Non Nutritive components of Diet?

Ans. Water & Fibers or Roughage coloured, flavoured.

Q6. Which type of vitamin B are found in diet?

Ans. Vit. B₁, B₂, B₃, B₅, B₆, B₁₂ = 6 Vit. B.

Q7. Mention two diseases which come from deficiency of protein?

Ans. Kwashiyorkan & Marasmars.

Q8. Name the macro minerals which should be part of our diet?

Ans. Calcium, Iron, Sodium, Phosphorus, Iodine, Potassium.

Q9. List down four myths about dieting?

Ans. (i) Healthy food is expensive.
(ii) Dieting makes you loose weight.
(iii) No fat diet is good.
(iv) Don't take milk immediately after eating fish?
Q1. Explain Balanced diet and its functions in our body?

Ans. Balanced diet: Balanced diet is that which is consisted of various constituents of food in accurate and appropriate quantity and quality according to the requirement of individual.

**Functions of Balanced diet :-**

(i) Sufficient energy is given by balanced diet.
(ii) It helps individual to grow and develop to optimum level.
(iii) Proper functioning of organs is done by balanced diet.
(iv) It helps to repair or replace the worn out tissue.
(v) Balanced diet improves the defence of body.
(vi) It helps to improve the overall health status.
(vii) Balanced diet improves metabolism.
(viii) It prevents deficiency diseases and maintain body weight thus overall efficiency of individual improves.

Q2. Mention micronutrients which are important for body?

Ans. Vitamins and minerals are micro nutrients which are needed for our body in small amount but they have their importance for body.

**Vitamin A** - This vitamin is also known as Retinol needed for Normal growth & development.

**Vitamin D** - This is needed for formation of strong bones & teeth.

**Vitamin E** - It protect the cell membrane.

**Vitamin K** - It helps in blood clotting.

**Water soluble Vitamin** :- Vit. B - Known as Thiamin. It helps in growth & development.

**Vitamin C** - It known as Ascorbic Acid. It helps to maintenance of ligaments.
Minerals:
- **Iron** :- It needs for formation of haemoglobin.
- **Calcium** :- It resources for bone and teeth formation.
- **Phosphorus** :- It makes strong teeth & bones.
- **Sodium** :- It helps nervous system for better neuromuscular responses.
- **Iodine** :- Deficiency causes Goitre.
- **Fluoride** :- It helps teeth & nails.
- **Chloride** :- It helps body to fight against infection.

Q3. Write importance of protein for our body?

**Ans.** Proteins are basic structure of all living cells. Proteins are main components of muscles, tendons ligaments, organs, glands and all living body fluids like enzymes hormones and blood.

Proteins are needed for growth & development of body. It helps to repair or replace the worn out tissues. It does not provide energy in normal routine whereas it acts as energy source only under extreme starvation. Proteins are required for making blood, muscle, Nails, skin, Hair and body parts and repair them when needed and are important in some situation like early development and maturation, pregnancy lactation, or injury like burn etc.

Q4. Write difference between types of carbohydrate simple and complex carbohydrate?

**Ans.**
1. Simple carbohydrate give quick energy on the other hand complex carbohydrates release slow energy.
2. The types of simple carbohydrates are Glucose, G lactose, Fructose Maltose, Sucrose, Lactose. Complex are starch, Glycogen, Dextine and Cellulose.
3. Simply Carbohydrate are called mono saccharides while complex are called polysaccharides
4. Complex Carbohydrate are sweet in taste but complex are sweet in taste
5. They can be absorbed quickly other side complex carbohydrates takes time.
(vi) Simple carbohydrates can be dissolves in water but complete not.

Q5. Mention five pitfalls of dietry :-

Ans. Following are pitfalls of dietry-

1. Extreme Reduction of Calories :- Person reduces the diet considerably which causes low level of energy thus person feels tiredness body aches.

2. Skipping meals :- People often skip meals to reduce weight whereas in react meal they take large amount of food.

3. Low energy diet :- The person take diet without fats and less carbohydrates by which health is affected.

4. Not performing Physical Activity :- People offer Consider that reducing diet is good for controlling weight then they neglect physical activity which is equally important for healthy lifestyle.

5. Taking less Liquid :- People often think that drinking water or liquid makes them to gain weight which is wrong.

Q6. How water is useful for as ? Explain Brietly ?

Ans. Water in very useful component of our diet because.

Blood comprises 90% of water with help of water through blood the nutrients are carried to various deals of body. It important for secretion of waste products. It regulates body temperature. Our body loses approximately 2% of our body weight or water per day. We compensate thus loss of water by drinking water and by in take of food substances. It also functions as a lubricant keeps the skin moist and protects the body from shock. Amount 20% of water in take comes from food and remaining intake come from drinking water.

Q7. How food intolerance in treated ? What are systems Explain in brief?

Ans. Food intolerance is treated by medical help where we know the food which causes problem. food intolerance is more common than food allergy. Food intolerance is a term used widely for varied physiological response associated with a particular food. The individual elements of certain foods that cannot be properly purposed and absorbed by our discolored system.
Systems of Food Intolerance:

Food intolerance can cause nausea, stomach pain, Diarrhoea, Vomitting, Flatulence Gas, Cramps heart burn, headache, irritability, or nervousness etc.

Q.8 What do you mean by bulimia Nervosa? Mention causes?

Ans. It is eating disorder characterized by binge eating and consuming a large amount of food in short time and after taking food persons try to get rid of one of consumed food, by vomiting taking a laxative or excessive exercise to reduce weight.

Two causes of Bulimia Nervosa.

(1) Purging Type - Individual which has this type of vomit (self induced), a use of laxatives or diuretics (water pills) to avoid gaining weight from binge.

(2) Non purging type - Individual engages self in regular fasting or excessive exercise.

(i) Abnormal levels of Hormones

(ii) Dietary.

Q.9 Is fat useful or not useful for us and for our body, explain?

Ans. (i) Fats are store in body and are used as emergency sources of energy.

(ii) Fats are important sources of energy for long duration activities and important for proper function of glands and other internal organs.

(iii) It helps in transpotation of fat soluble Vitamins A, D, E,K

(iv) It help in blood clotting maintenance of skin & hair.

Our diet should consist of 5 to 10% of fat higher in take of fat high risk of obesity and many heart diseases.

(v) Fats maintain body temperature and protect it from effect of external temperature.

(vi) They make body soft & oily.
Q.10 Explain fat soluble vitamins and their sources and water soluble vitamins and their sources.

Ans.

Fat Soluble Vitamin

Vitamin A  Vitamin A is found in Cod liver Oils/animal Liver, york, Milk, & Milk products.

Vitamin D  Vitamin is founding milk, fish, Liver oils?

Vitamin E  Vitamin E is founding Green Leafy Vegetables, Pulses, Liver eggs, cereals.

Vitamin K  In tomatoes, Potatoes, Spinach, cabbage, soyabean, fish, cauliflower wheat, eggs, meat, we can find vitamin K.

Water soluble Vitamins

Vitamin B  Vitamin B → Sources include peas, perk Liver, Legumes

B2 →  We can find on Liver, eggs, dark green vegetables, legumes, whole and enriched grain produced milk.
B3 → Liver Fish, poultry meat, peanuts, whole & enriched grain products.

B5 → Pork, meats whole grains, cereals legumes, green leafy vegetables

B6 → Cereals, grains, legumas, vegetables, milk, cheese, eggs, fish liver, meat, flour.

B12 → Fish, red meat, poultry, milk, cheese, eggs.

Vitamin C → Lemon citrus fruits like grapefruits, oranges, and kiwis, other good sources mango, papaya, pineapple.

LONG ANSWER TYPE QUESTION (150 TO 200 WORDS) - (5 MARKS EACH)

Q.1 What is Balanced Diet? How it is important for individual body?

Ans. Balanced diet is that diet which consists of various constituents of food in accurate and appropriate in quantity and quality according to the requirement of an individual and helps in growth and development of our body.

Importance:

(i) **Energy Resource**: It gives sufficient energy to the body for various activities.

(ii) **For optimum growth & Developments**: It helps individual to grow and to achieve the aim of all-round development.

(iii) **Proper function of Organs**: By help of balanced diet, every organ functions well and properly.

(iv) **Faster Recovery**: It helps to repair and replace the worn out tissues thus faster recovery.

(v) **Strong immune system**: It makes better resistance power to the body to make a good immune system.

(vi) **Improves fitness Level**: It improves over all health states and resulting in fitness of body by preventing diseases.

(vii) **Improves Metabolism**: Quality of metabolizing and thus efficient release of energy.
(viii) **Prevents Deficiency Diseases** :- It gives all necessary nutrients to body so deficiencies diseases cannot takes place.

(ix) **Maintaining body weight** :- It helps individual to maintain proper body weight.

(x) **Overall efficiency improves** :- It improves all physiological systems of body then more of efficiency level of individual. In this way Balanced diet is useful for as.

Q.2 What factors which can affect for making Balanced Diet ?

Ans.  

(i) **Age** :- Age plays great role in making diet for like in growing age a child need more protein but old aged people should avoid more proteins and fats but should take more minerals & vitamins

(ii) **Gender** :- Sex difference causes variation in diet more caloric requirement to male & less for female.

(iii) **Profession** :- Heavy physical Activities work out needs more calories demand & less physical activities work out less calories demand.

(iv) **Body weight** :- Obese person need fibrous food more while slim or lean needs more protein.

(v) **Specific Sports Diet** :- Various sports need specific diet like long distance runner need more fat, contact body games player need more protein, explosion strength player needs more carbohydrates.

(vi) **Sufficient Roughages** :- It is non nutritive but important It consist fibers that found in fruits & Vegetables.

(vii) **Pregnancy or feeding Mother** :- Pregnant mother needs extra diet- carbohydrates, protein, fat, vitamins, minerals etc.

(viii) **Diet During Health Problems** :- Injured person should take more protein and minerals patients should be given diet full of mineral & vitamins.

(ix) **Seasonal Food** :- Seasonal food is easily available and economical moreover the nutritional value is high.

(x) **Climatic Condition** :- The effects the diet Like in hot places food should be has oily fried, while in coaster region the food should be more liquid.
(xi) **Natural Diet** :- Natural sources of diet are early digested by body, less polluted not synthetic food.

(xii) **Doctor’s Recommendation** :- Diseased or sick person should take accords to doctor recommendation and patient avoid fried food jaundice patient avoid protein.

(xiii) **Eating Habbits & Social Customes** : They also effect the diet individual some take low vegetables veg. other don’t take it so it is according to customs also.

Q.3 Why macronutrients should be essential part of our diet.?

Ans. **Components of Diet**

```
Macro Nutrients               Micro Nutrients
| Carbohydrates               | Minerals |
| Fats                        | Vitamins |
| Proteins                    |
```

**Macro Nutrients**

**Carbohydrates** : They are main source of energy for almost all activates. They give quickly energy and less amount of carbohydrate in diet causes under nutrition and weight loss. Excess amount stored in livers and tissues from there they release the energy when in need.

**Proteins** : Proteins are needed for growth & development of body. It helps and replace the worn out tissues. It does not provide energy under normal routine but give energy under extreme starvation, High intake of proteins creates overload over kidney and livers. Deficiency diseases are kwashioskar or maras mus.

**Fats** : Fats are emergency sources of energy and stored in body. Fats carry Vitamine A, D, E, K. They are sources for energy for large activities. In proper functionary of glands and internal organs against the blood clotting, maintains the skin and important of proper functionary of glands and internals organs and it helps on blood clotting, maintains the skin and hair. Our diet should consist of 10% of Fat more intake more risk of
obesity and many heart diseases so this Nutrients and in highly proportion of diet and should be taken in proper amount according to need.

Q.4. Mention the types effect of micro nutrients on our body?

Ans. Minerals & Vitamins are the micro nutrients of diet.

Functions of micro-nutrients

(i) **Calcium** : It is required for bone and teeth formation, deficiently causes osteoporosis, Rickets and retorted growth.

(ii) **Iron** : It in required for formation of haemoglobin, deficiency leads to anaemia.

(iii) **Phosphorus** : It helps in making strong bones and teeth.

(iv) **Sodium** : It helps nervous system for better response, deficiency causes cramps and tiredness.

(v) **Iodine** : It helps in proper growth & development of body, deficiency leads to goitre.

(vi) **Fluoride** : It helps teeth and nails.

(vii) **Chloride** : It helps body to fight against infection, proper functions of nervous system.

**Vitamins** :

- A → helps in normal growth & development of eyes and skin.
- D → Important for formation of strong bones & teeth.
- E → It protects the cell membrane and acts as antioxidant.
- K → helps in Blood Clotting and heals wounds.
- B → Vit B, for growth & development.
- B₂ → helps in growth of RBC.
- B₃ → Play important role in energy transfer, reactions in the metabolism of glucose, fat & alcohol.
- B₅ → It involved in oxidation of fatty acids & carbohydrates.
- B₆ → It helps in metabolism of amino acids.
B₇ → It play key role in metabolism of lipids, proteins and carbohydrates.

B₉ → Folic Acids Needed for normal cell division especially during pregnancy and infancy.

B₁₂ → It involved in cellular metabolism of carbohydrates proteins and lipids an helps in production RBC in bone marrow.

C → helps in healing wounds it helps formation of growth & repair of bones, skin & connective tissues. It makes healthy teeth & gums.

Q5. What is the effect of Diet on performance of spots persons ?

Ans. Diet plays important role in spots performance. The following table will be followed for various activities.

<table>
<thead>
<tr>
<th>Spots Activities</th>
<th>Diet before competition</th>
<th>Diet During competition</th>
<th>Diet Aflis competitions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Endurance activities</strong> - like players of marathon, Basketball, football, Hockey Cyclist</td>
<td>more amount of complex carbohydrate</td>
<td>Simple carbohydrate with more water</td>
<td>more complex Carbohydrates more vitamins &amp; minerals, low fats more water</td>
</tr>
<tr>
<td><strong>Skill Activities</strong>-speed activities, middle distance races, kho-kho, water polo, skating swimming</td>
<td>More Carbohydrates simple and complex</td>
<td>Simple Carbohydrates in Liquid</td>
<td>more Complex Carbohydrates more Vitamins &amp; minerals more Proteins</td>
</tr>
<tr>
<td><strong>Explosive Activities</strong> - Body Contact Activities, Wresting, Kabaddi, Judo, Jump, Throw</td>
<td>more Carbohydrates both - simple and complex</td>
<td>more Carbohydrates in Liquid</td>
<td>more Carbohydrates Complex more Proteins more Vitamins &amp; minerals</td>
</tr>
</tbody>
</table>

Q6. State four Myths of Dieliving ?

Ans. Myth : Low fat or No fat diet are good for you

Fact : This is not true cutting down saturated fat and eating unsaturated fat is good body needs fat for energy, tissue repair and transport Vitamins A,D,E,K.
(ii) Myth : Fasting Makes you loose weight.

Fact : True for short period by hinder weight loss. In long term it leans muscular tissues so exercise is recommended for weight loss.

(iii) Don’t drink water while taking food - It digest food It don’t hamper metabolism so It is not true.

(iv) Myth milk should not be taken immediately after fish

Fact : It is not true It will not give any allergy or irritation scientist don’t think so.

(v) Fruits and vegetables one more nutritive than cooked foods ones :

Fact : Scientist discovered in recent years that cooking actually boost levels of important compound in some fruits and vegetable and cooking also breaks down fiber making it easier for your body to process.

(vi) Myth - Eat less nuts they are too fattening

Fact : It is true that nuts contain a lot of fat but it is mostly the food kind. Recent research suggested that eating nuts as part of a healthy diet may even help you lose weight
UNIT-4

POSTURE CORRECT POSTURE

Key Points:
- Concept of correct postures - standing and sitting.
- Advantages of correct posture.
- Causes of Bad Posture
- Common Postural Deformities - Knock Knee; Flat Foot; Round Shoulders; Lordosis, Kyphosis, Bow Legs and Scolioses.
- Physical activities as corrective measures.

BALANCED AND WELL CO-ORDINATED BODY MOVEMENT

- Fitness of Body
- Look and Personality
- Avoids Waste of Energy
- Reduces chances of diseases & deformities
- Social Appearance
- Increased hygienic level
- Clarity in Speech
- Economic Expenditure of Efforts
- Healthier Mentality
- Controls undue fatigue

Correct Posture of Standing (Side View).
4.1 Definition: Good or Correct posture is one, in which the body is so balanced as to produce least fatigue.

Meaning: Correct or good posture in the position of body held without any sense of effort. The efficiency of body depends upon good posture. It is directly related to the health status of an individual. By good posture the various organs of the body get rest, the body does not yet easily tired and the person remains in good health.

A. Correct Sitting Posture: In correct sitting posture the back bone should be so the natural curve should be visible. The upper region of back bone should be straight against back of chair. Head should in line to hip and shoulder. Arms should be balanced, the waist should touch the back of chair. Thigh should in straight line resting on seat legs should rest vertically on feet.

B. Correct Standing Posture: In correct standing posture, feet apart about 8 to 12 inches Feet should be parallel to each other and balanced evenly on both feet. Hold the head straight, chin parallel to floor, keep shoulder hips and knees in straight line. From side view ear, shoulder, hip, knee and ankle should be centred along an imaginary straight line. The centre of Gravity (C.G.) Should be with the centre of Gravity.

4.2 Advantages of Correct Posture:

(i) Good physical Appearance

(ii) Grace & Efficiency of movement-

- Physical Fitness
- Hygiene Value
- Social Value
– Economic Value
– Prevent Disorders & Diseases
– Change in mental Attitude
– Lessen the Fatigue
– Improves Speech
– Psychological Balance
– Improves Appetite
– Reduce Postural Deformities
– Better Skill perfection
– Better Selection of Players
– Good Body Balance

4.3 Causes of Bad Posture

(i) Accident
(ii) Diseases
(iii) Lack of Nutritional Diet
(iv) Wrong Postural Habit
(v) Improper Treatment
(vi) Psychological Stress
(vii) Lack of Sufficient Strength
(viii) Age Factor
(ix) Poor Eyesight
(x) Bad Shoes or Clothing
(xi) Obesity
(xii) Taking Heavy Weight on one side
4.4 Common Postural Determities

- A - Kyphosis
- B - Round Shoulders
- C - LORDOSIS
- D - Scoliosis
- E - Knock Knees
- F - Bowlegs
- G - Flat Foot

4.5 Corrective Measures

A. **Kyphosis** - It cause humpat back of body shoulder comes forward and neck drops forward - It is also called round upper back.

B. **Round Shoulders** - It is the postural defect in which shoulders are projected forward.

Corrective measures -

(i) Chakra Asanas
(ii) Dhanur Asanas
(iii) Bhujang Asana
(iv) Ushtt Asanas
(v) Backward Bending
(vi) Use pillow and sleep straight
(vii) Holding the horizontal bar regularly for some line
C. LORDOSIS - Inward curvature of the spine, the abdomen is ahead of body and shoulder comes out ward and side ward, Body weight shifted back ward.

Corrective Measures - Forward Bending Asanas.

(i) Paschimotan Asanas
(ii) Halasanas
(iii) Forward Bending
(iv) Alternate Toe Touching
(v) Stoop Walking (Long Stride Walking)
(vi) Proline Luyins.

SCOLIOSIS : It is problem of spine in which vertibral column bends to sideward.

Corrective measures -

(a) Ardh Chakra Asanas
(b) Trikon Asanas
(c) Tarr Asanas
(d) Chin-ups

KNOCK KNEE : In this thigh bend inward and knees strike each other while walking & running.

Corrective measures :

(a) Vriksh Asanas
(b) Akarr Dhanur Asanas
(c) Padma Asanas
(d) Pillow Walking
(e) Outward walking
(f) Horse Riding
(g) Walking Calipers
**BOW LEGS**: This is the defect of legs in which legs bend outward. The space between knees widens up and legs take curve shape.

*Corrective measures*:

(a) Ardh chakra Asanas

(b) Garud Asanas

(c) Ardh Matsendra Asanas

(d) walking Inward

(e) Walk on bend toe of the feet

**FLAT FOOT**: In this default of feet person gives complete print of their foot sole over the plane surface. In flat foot the inner curve of foot bulges more than normal.

*Corrective measures*:

(a) Tarr Asaras

(b) Walking on sand

(c) Regular running

(d) Good quality shoes

(e) Pressure over foot

(f) Writing with foot

(g) Rope skipping

(h) Sit down hold wad of paper by toes

(i) Jumping on toes regularly

(j) Performing up and down the heels regularly

**VERY SHORT ANSWER TYPE QUESTION (1 MARK EACH)**

Q1. What do you mean by posture?

And. It is the specific position of a person while sitting, standing, walking, lying etc.
Q2. Give two advantages of correct posture?

And. (i) Grace & Efficiency of Movement: With the help of correct body posture efficient movement is possible, so in result balance & coordination of movement will be possible.

(ii) Physical Fitness: Good posture is essential component of physical fitness by this other component like balance coordination flexibility will be achieved for fitness.

Q3. State or mention common postural deformities?

Ans. (i) Spinal Curvature
(ii) Flat Foot
(iii) Knock Knee
(iv) Bow legs
(v) Round shoulders

Q4. What is correct posture of walking?

Ans. In the posture first foot touches the ground and then the weight in transferred on the toe. This is called heel toe action. Walking should look smooth efficient and graceful.

Q4. What should be our standing posture?

Ans. In this posture both the heels should join together on the surface while the toes should be placed 3 to 4 inches apart. One should stand straight & erect. Knees straight chest forward; chin, inside belly inside and back ward and equal body weight on each of legs and evenly balanced.

Q5. Explain briefly the causes of flat foot?

Ans. Rapid increase in body weight, improper shoes, carry having weight for longer period of time may cause this problem.

Weak muscles is the main cause, they unable to take the load of body.

Q6. What precautions we should take for kyphosis?

Ans. (i) We should not lean forward or study for longer period
(ii) We should do regular exercise
(iii) We should take balanced diet
(iv) We should learn to correct sitting & standing position to avoid this deformity

Q.7 What are the causes of scoliosis?
Ans. Undeveloped legs, back bone, more weight or heavy weight on one shoulder, diseases of backbone joints, wrong exercise, lack of exercise, deafness, inherited diseases.

Q.8 Explain the corrective measures for lordosis deformity?
Ans. (i) Do Uttar pad asana and Halasanas pashchimotanasan.
(ii) perform sit-ups regularly
(iii) Stand erect now bend your body forward from hip level. Repeat this exercise for 10 times
(iv) Diet should be controlled, excessive food should be avoided.

Q.9 what one causes for bow legs?
Ans. (i) Deficiency of calcium and phosphorus in bones
(ii) Heavy weight carry
(iii) Walking in very short period or forcing the child to walk early
(iv) Ricket disease
(v) Heavy weight of body
(vi) deficiency of Vitamin D
(vii) walking in a improper way

Q.10 What do you mean by knock knee?
Ans. It is a major postural deformity. In normal standing position the knees touch each other or knock each other. The gaps between ankles keeps on increasing and finds difficulty in walking properly and running.
SHORT ANSWER TYPE QUESTION (80 TO 90 WORDS)
(3 MARKS EACH)

Q.1 What is the difference between kyphosis & lordosis?
Ans. Kyphosis - It is also called hunch back is a common condition of a curvature of upper spine. It means backward or posterior curve or a decrease or cervical of a forward curve. This is also known as round back. In kyphosis depression of chest is very common.

Lordosis - In word curvature of the spine is known as lordosis it is actually increased forward curve in the lumber region. The person suffering from it faces problems while walking or standing. In early stages lordosis is curable.

Q.2 What are the corrective measures for bow legs?
Ans. Following measures be taken to avoid or correct the bow legs :-

(1) Special shoes can be worn that rotate the feet out ward.
(2) Child uses corrective brace during treatment of disease.
(3) Dietary supplements like Vitamin D, Calcium, Phosphorus should be taken.
(4) Stand erect keeping the feet together, wrap a soft cloth tightly on both knees - Try to squat as far as possible it 4 to 6 time
(5) Walk on inner toe of the feet
(6) Walk in bend toe of the feet
(7) Do Ardh chakra Asanas, garud Asanas, Ardh Matsendra Asanas.

Q.3 Describe the remedial measure for postural deformity of kyphosis?
Ans. (i) While sitting in a chair buttock should be touching the back of the chair, hips should be placed as far back as possible hold your hand by the other hand behind the back of the chair stretchy your shoulders back wards - stay in this position for some time.

(ii) We should do chakra Asanas, Dhanur Asanas, Bhujang Asanas and Ushtt Asanas regularly.
(iii) All exercises of backward bending are useful.

(iv) Lie down on your chest keeping hands on hips allow raise your trunk with head a few inches above the ground. Try to raise it slowly come back to earlier position. this exercise should be repeated 10 times.

(v) Use pillow under your back at night while sleeping.

Q.4 What corrective measures we take for flat foot?

Ans. (a) Tarr Asanas - The person slowly raises the heel while standing body balances on toes where as hands and head are raised up

(b) Walking on sand :-

(c) Regular running

(d) Good quality shoes speciallied flat foot corrective shoes.

(e) Flat foot can be treated by arch supports foot gymnastics another exercise as recommended by a doctor.

- Pressure over feet.
- Writing with foot
- Yogic exercise will help the flat foot problems.
- Jumping on toes regularly
- Sit down. Hold wad of paper by toes
- Rope skipping regularly
- Performing up and down on heels regularly

Q.5 How can we correct/treat the problem of scoliosis?

Ans. (a) Ardha Chakra Asana - In this asanas the body is bent side ward while standing with feet apart. One hand should be close to head.

(b) Tricon Asana - In this asanas the body is bent side ward with feet apart. One hand should be close to head.

(c) Tarr Asanen - In this body raised up over the toes where as hands are raised up while looking up.
(d) Chin ups - In this Asanas the body in stretched up once a horizontal bar while body weight hanging vertically and lifted up.

(e) The dietary in take should be sufficient in quantity it should not be excessive. The food should be healthy balanced and nutritious.

Q.6 What are the remedies for knock knee?

Ans. Knock knee can be treated by following exercises

(a) Vriksh Asanas - It is balancing on one foot while other leg is fixed resting on other leg thigh. Hands are kept in front.

(b) Akarn Dhanur Asanas : Ith this asanas the person stretches one leg near the ear where as other hand holds the opposite straight

(c) Padma Asana

(d) Pillow walking - In this pillow in kept between legs and person presses the legs.

(e) Out ward walking - In this person tries to walks over the outer edges of foot while the inner part of sole is raised up

(f) Horse riding is the most effective and best exercise is this respect.

(g) walking collipers are also useful.

(h) Gomukh Asana is also helpful

Q.7 what are the causes for knock knee?

Ans. (1) Diseases of the bones and ricket may cause permanent knock knee?

(2) Lack of Vitamin D or inability to metabolize Vitamin D due to kidney disease can cause growth disturbance of the bones in body.

(3) A lack of balanced diet calcium, phosphorus etc.

(4) Obesity and carrying heaving weight in early ages.

(5) Weak legs due to weak muscles
(6) Chronic illness

(7) During childhood knock knees causally develop as an effort to maintain balance particularly when the child begins to walks or if the child’s foot rolls inward or turns outward.

Q.9 What are the causes & precautions for bow legs?

Ans. The causes for bow legs are:

1. It is mainly caused due to deficiency of calcium & phosphorus in bones. Long bones tend to be softer and bends outward under body weight. In case of overweight children the chances of bow legs increases. It is also caused due to the deficiency of Vitamin D, walking in an improper way or forcing the children to walk early may also lead to this deformity.

Precautions - The following precaution we should take -

1. Prevent the children from getting over weight
2. Normal exposure to sunlight
3. Appropriate level of Vitamin D, calcium & phosphorus in the diet.
4. Child should be re-assessed at least every 6 months.
5. Children should be given balanced diet.
6. Don’t force children to walk early

LONG ANSWER TYPE QUESTION [50 TO 200 WORDS] - (5 MARKS EACH)

Q.1 What is lordosis? What are the causes of this problem and how can we treat this deformity.

Ans. Lordosis : Lordosis is the problem of lumber spine. In this postural deformity lumber spine bends in front beyond the normal level. Abdomen is ahead of body and shoulders come outward and sideward. the body weight shifted backward. Thus lot of pressure on heels.

Causes of lordosis - Unbalanced diet, improper environment, improper development of muscles, obesity and diseases affecting vertebrae and
spinal muscles are the main cause of lordosis, besides this no doing exercise and taking excessive food may also be big causes of lordosis.

**Treatment for Lordosis** - This problem can be treated in the following way -

(a) **Paschimotanasana** - In this asanas legs are stretched forward we try to touch the forehead to the knees & while hands hold the feet.

(b) **Halasana** - In this asanas legs are raised up from the lying position. Slowly or bending legs towards the head, the feet - touch the floor and body makes a complete arc.

(c) **Alternate toe touching** - In this, feet apart and try to touch opposite hand to foot while other hand is raised up.

(d) **Stoop walking (Long stride walking)** - In this long stride during walking is done while body is bent forward and downward other alternative is stepping over stairs.

(e) **Proline lying (Makrasana)** - In this persons lies with face down whereas abdomen and chest touch the surface.

**Q.2** What are the causes of bad posture? Explain detail?

**Ans.** There are many causes of bad posture. Some are environmental and other may be due to heredity. Bad posture causes many health problems. It reduces the physical output or efficiency to a great extent. It leads to psychological stress, bad looking, less socials acceptance etc. It is cause of many postural problems like kyphosis, round shoulders, lordosis Scoliosis, Knock knees, Bowledgs Flat foot.

Some of General causes of bad posture are given below.

1. **Accident** - It may arises due to accidents. It may cause postural deformity due to injuries of muscles, joints & bones.

2. **Diseases** - Many leads of health problems like diseases, illness and chronic sickness cause bad posture.

3. **Lack of Nutritional Diet** - Sometime bad posture arises due to unbalanced diet, over diet, under diet and Lack of nutritional diet.
Wrong Postural Habits: The wrong sitting posture and wrong postural habits during sitting, standing, lying, working, etc., cause bad posture.

Improper treatment: Sometimes the improper treatment or wrong treatment for curing injury causes bad posture.

Psychological Stress: Psychological stress in life leads to mental tension, unbalances emotions or behaviour changes. Sometimes it leads to postural deformity.

Lack of sufficient strength: The poor muscular strength or the unbalance strength of agonist and antagonist muscular cause postural deformity.

Age factor: In old age, the muscular strength reduces, this bad posture may arise.

Poor Eyesight: Poor eyesight causes stress on our head and neck. Thus the body bends forward and it may cause bad posture.

Bad Shoes or Clothes: In some cases, bad posture arises due to poor quality shoes or clothing.

Q3. What do you mean by posture? What are benefits of correct posture? Explain?

Ans. Posture: Posture is the body position. It may be static or dynamic such as sitting, standing, lying, walking, running, reading, etc.

Benefits of Correct Posture:

1. Attractive physical appearance: The first image of personality comes through good posture. A good posture makes an individual appear smart, good looking, charming, and attractive.

2. Improves Health Status: Correct posture of the body reflects positive health status of an individual. Good posture in an image of good health and sound body.

3. Psychological Balance: A good posture improves the psychological balance of the body and mind. It improves the activeness of mind and leads to optimum development.
(4) Lesser Strain and Pain Over Joint :- Good posture causes unstrain and pain over joints as it distributes the body weight equally over the joints.

(5) Improves Social Status :- A good physique reflects positive social qualities. Good posture is an image of happy life style and social well being of an individual.

(6) Better functions of Body Systems :- Various systems of body set full chance to function well if good posture in maintained. It provides optimum functioning of internal organs.

(7) Improves Appetite :- Good posture increases appetite. Thus health status is improved, it causes less pressure over abdomen. Thus digestive organs functions properly.

(8) Reduces Postural Deformities :- Correct posture helps to prevent postural deformities. Thus health problems are reduced like kyphosis, Lordosis.

(9) Skill perfection :- Good posture helps to improve skills. Thus more perfection in activity. It makes the movement graceful.

(10) Better selection of Players :- Posture help coaches and teachers for better selection of players for various activities.

(11) Better Optimum Physical Efficiency :- Good posture provides optimum opportunity an individual to improving physical fitness and health.

(12) Good Body Balance :- Correct posture provides sound body balance thus more stability of individual while performing workout.
CHAPTER 5

CHILDREN AND SPORTS

Key Points:

- Motor Development in Children
- Factors affecting Motor Development
- Physical and Physiological benefits of exercise on children
- Advantages and Disadvantages of Weight Training and Food Supplement for Children
- Activities and Quality of Life

5.1 Motor Development-Motor Development refers to the development of a child’s Bone, muscles and ability to move around and manipulate his/her environment.

Motor Development

- Gross motor development (large muscles of the body)
  - Sitting, standing, walking
  - Running, jumping

- Fine motor development (Small muscles-finger, toes, eyes & ears)
  - Painting, writing, cutting
5.2 Factors affecting Motor Development

1. Heridity
2. Nutrition
3. Sleep
4. Immunization
5. Environment
6. Stimulation and Interaction
7. Opportunities
8. Training and Practice
9. Recreation
10. Education-Learning and Productivity
11. Gender
12. Posture Deformities
13. Sensory Impairment
14. Obesity
15. Social Skills
16. Mental Health

5.3 Physical and Physiological benefits of Exercise on Children

<table>
<thead>
<tr>
<th>Physical benefit of exercise</th>
<th>Physiological benefits of Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Physical Health and Strength</td>
<td>1. Strengthening the heart</td>
</tr>
<tr>
<td>2. Mental Health</td>
<td>2. Strengthens bones and muscles</td>
</tr>
<tr>
<td>3. Emotional Well being</td>
<td>3. Controls Blood Sugar</td>
</tr>
<tr>
<td>4. Social Health</td>
<td>4. Regulate Blood Pressure</td>
</tr>
<tr>
<td>5. Positive School Environment</td>
<td>5. Increases Energy level</td>
</tr>
<tr>
<td>7. Controls anti-social behavior</td>
<td>7. Reduce Cholesterol level</td>
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</table>
5.4 Advantages and Dis-advantages of Weight training and food supplement for children

**Weight training:** Those exercise, that are designed to strengthen specific muscles by causing them to overcome a fixed resistance, usually in the form of Bar bells or Dumbles

**Advantages of Weight Training**

1. Improves Posture and range of motion
2. Increases muscles strength, bone density and endurance
3. Protection against injury
4. Improve motor performance
5. Promote healthy Blood pressure and Cholesterol levels
6. Maintain Healthy Weight
7. Develop confidence and self esteem
8. Improve immune system functions
9. Improve Psyco-socio well being
10. Promote and develops exercise habits

**Disadvantages of Weight Training**

1. Maturity
2. Introduce Injury
3. Safety
4. Loss of Flexibility

**Food Supplements for Children:** The nutrients, that is added to diet to nourish the body Without getting regular diet.

Food supplement include Vitamins, Minerals, Fibers, Fatty acids or Amino acids among Other substances in the form of Powder or Tablets.
Types of Food Supplement

1. Protein Supplement
2. Vitamine Supplement
3. Calorie Supplement
4. Fiber Supplement

Benefits of Food Supplements

1. To provide the substances to body in case of incomplete diet
2. They ensure to replenish sufficient quantity of nutrients to avoid deficiency from meal
3. Provide instant energy to the body
4. Children with the chronic medical conditions such as Asthma, Scurvy, rickets or digestive problems—provide nutrients to survive

Disadvantages of Food Supplements

1. Some body building supplements may contain steroid or like substance which are very harmful substance and could lead to serious liver injury, stroke, Kidney Failure etc.
2. Weight loss supplements may contain numerous untested ingredients, which are not safe and effective for children
3. Mostly, the supplements cause allergy and intolerance among the children.
4. Dietary supplements, including the herbal products may interact with other product or medicines may cause unwanted side effects.
5. Numerous Multi-vitamins and Mineral supplements may cause headache, Diarrohea, nausea, cramps etc. among the children due to overdose.

*Warning*:— “Food supplements must be taken under the supervision a qualified medical practitioner”

5.5 Activities and Quality of Life

“Quality of life is the satisfaction of any individual’s values, goals and needs through the actualization of their abilities or their life style”
“Quality of life as well being covering all areas of life i.e. Physical, Mental, Social, Emotional And Spiritual well being”

Role of Physical Activities in Improving Quality of Life

<table>
<thead>
<tr>
<th>Mental Health</th>
<th>Physical Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Boost to mental wellness</td>
<td>- Improve the blood circulation</td>
</tr>
<tr>
<td>- Improved memory and active mind</td>
<td>- Control weight</td>
</tr>
<tr>
<td>- improved mental health and mood</td>
<td>- Prevent bone loss</td>
</tr>
<tr>
<td>- Improved reaction time</td>
<td>- Boost energy level</td>
</tr>
<tr>
<td>- Releases tension</td>
<td>- Improve self image</td>
</tr>
<tr>
<td>- Promotes Enthusiasm &amp; optimism</td>
<td>- Help delay or prevent chronic illness &amp; disease</td>
</tr>
<tr>
<td>- Manage stress, anxiety &amp; depression</td>
<td>- Better posture and balance</td>
</tr>
<tr>
<td></td>
<td>- Stronger Immunity</td>
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VERY SHORT ANSWER TYPE QUESTION (1 MARK EACH)

Q1. Define Motor Development?
Ans. Motor Development refers to the development of a child’s bone, muscles and ability to move around any manipulate their movement.

Q2. What is Physical Activity?
Ans. Physical Activity is defined as any bodily movement, produced by skeletal muscles, requiring energy expenditure.

Q3. State Food Supplement?
Ans. Food Supplement means Nutrients that is added to the diet to nourish body that are not getting in the regular diet. Food supplement include Vitamins, minerals, Fibres, Fatty Acids or Amino acids among other substances. They can be In the form of powder or tablet.

Q4. What do you mean Weight Training?
Ans. Weight Training means, those exercise that are designed to strengthen specific muscles by causing them to overcome a fixed resistance in the form of Barbells, Dumbles.
Q5. Elucidate the meaning of Gross Motor Development?
Ans. Gross Motor Development involves, the development of large muscles in the child's body such as sitting, walking, running, climbing, jumping etc.

Q6. Define Fine Motor Development?
Ans. Fine Motor Development involves, the small muscles of the body, specially in the small movements of Fingers and hand such as Writing, Holding, Catching, Smashing etc.

Q7. Write the meaning of Quality of Life?
Ans. Good Quality of Life refers to a life style where a person can carry out their day to day activities comfortably without strain.

**SHORT ANSWER TYPE QUESTION (80 TO 90 WORDS) - (3 MARKS EACH)**

Q1. Disadvantage of Weight Training in the children?
Ans. 1. **Risk of injury:** Incorrectly and excessive weight training introduce injury and pain in the children

2. **Less flexibility:** Weight training reduces the level of flexibility because weight training mostly performs for the development of strength so children flexibility are negligible due to it.

3. **Maturity:** Children should not begin, weight training or any other workouts until they are physically and emotionally mature enough to handle it because unmaturity of children lead to serious, bony injury or deformities in the children.

4. **Growth of Children:** Excessive Weight training may cause negative effects on the normal growth of children.

5. **Needs a Supporter:** No child performs any Weight training or workout in case of absence of supporter.

Q2. Write the need of Food supplements?
Ans. Food supplements is an addition in diet intended to provide nutrition such as Vitamins, Fibres, Minerals, Amino acids and Fatty acids. The advantages of Food supplement are:-
1. Food supplements will provide the substances, their body needs, if the diet is incomplete.

2. Food supplements ensure they get the substances and vitamins in sufficient quantity against requirements.

3. Food supplements are the easy way to get nutrients as needed.

4. Food supplements provide instant energy in emergencies.

Q3. Write the Dis-advantage of Food supplements?

Ans.

1. Overdose of Food supplement always risk for organic systems, they may lead to allergic shocks or other reactions.

2. Food supplements are very expensive so it is not possible for each family to buy.

3. Some body building supplements may contains steroids or like substances, those could lead to serious liver, heart, kidneys injury.

4. weight loss supplements may contain numerous untested ingredients which creates risk for children.

5. The Possibility of contaminated Food supplement is very high so this great danger for children.

Q4. Write the physical benefits of exercise on children?

Ans.

Physical exercise provide and opportunity for children to feel healthy and good, be active and have fun and express themselves. Some of the physical benefits of exercise are:-

1. **Health:** Exercise encourages a healthy growth and development of children's body that includes developing coordination and movement control, feeling more energetic and maintaining a healthy body weight.

2. **Mental Health:** Exercise improves concentration skills and ability to manage anxiety and stress. It also helps children to feel more confident, happy and relaxed. It improves the Self-esteem and Self concept and brings the sense of belonging among the children.
3. **Social skills:** The great way of developing social skills like coordination, cooperation, team work among the children. It also help developing leadership quality in them. Active children are less involved anti-social activities or criminal activities.

Q5. Explain the Physiological benefits of Physical exercise on children?

**Ans.**

1. **Strengthens the Heart and its activity:** Regular exercise improves the working capacity of heart by strengthening the heart muscles and saves the person from various heart diseases. It prevents sugar accumulation in the blood and reduces the risk of diabetes. It regulates the blood pressure and increases the energy level of a person.

2. **Strengthens the Bones and muscles:** Regular exercise enhances the bones mineral density and also keeps them stronger. It is important for growing children to have stronger bones, even the muscles become stronger through regular exercise.

3. **Keeps veins and arteries clean:** Exercise helps to enhance blood flow in the body. It helps in reducing harmful cholesterol and fats from the child's body. It increases the flexibility of blood vessels and reduces extra weight.

**LONG ANSWER TYPE QUESTION [150 TO 200 WORDS] - (5 MARKS EACH)**

Q1. Write the Advantages of Weight Training?

**Ans.**

1. **Improve the posture and range of motion:** Weight training helps to develop correct posture and extension, contraction of muscles leading to increase range of movement.

2. **Increase muscles strength, bone density and endurance:** Resistance training can improve bone density and muscles mass. Due to the more muscles mass, the tolerance power is increased and improves endurance of the system.

3. **Protection against the injury:** Weight training, improves physical activity, system of the body and reduces risk of injury.

4. **Promote health blood pressure and Cholesterol level:** Physical exercise with the resistance training decreases bad cholesterol
level and increases good cholesterol. It also improves blood circulation, which is turn maintains a healthy blood pressure.

5. **Improves immune system function:** With the proper digestion, release of enzymes, Absorption of nutrients, release of toxic substances and healthy functioning of body Organs, the immune system functioning is improved and the body become capable of fighting against diseases and infections.

6. **Improves Psycho-social well being:** A child with the well shaped healthy body with more potential to work is better accepted by society. A well maintained healthy physique makes a child more confident or raise his/her self esteem.

Q2. Write the role of Physical activities in improving Quality of Life among the children?

**Ans.**

1. **Physical activity improved Mental health**
   a. Mental wellness: Physical activity can relieve tension, anxiety, depression and anger
   b. Improves memory and active mind: Exercise increases the flow of oxygen, which directly Effects the brain. Mental brilliance and memory can be improved with Physical Activities.
   c. Improves Mental activities: Regular Physical activities help in keeping the thinking Learning and judgement skills sharp. It can also reduce the risk of darker aspect of life.

2. **Physical activity improves social health**
   a. Physical activity help to improve self images
   b. Promote enthusiasm and optimism: Physical activities help a child to promote enthusiasm and optimism for better social recognition in the peer group

3. **Physical activity improves Physical Health**
   a. Stronger immunity: It enhances child’s immune system and decreases the risk of developing any chronic Illness and disease associated with the age and maintains quality of life
b. **Improves the heart activities and heart chronic diseases:** Physical activities help delay or prevention of heart chronic illness by improving the working capacity of heart such as controlling the blood pressure, good cholesterol, Controlling 2 types of diabetes

c. **Strengthens bones and muscles:** Regular muscle strengthening activities help to increase or maintain the muscle mass and strength. It also helps in improving healthy and flexibility of joints. Regular physical activities helps with the bones and joints of the body.

d. **Maintain healthy weight:** Regular physical activities helps with digestion and promotes regular movements. It also rises the metabolism and helps to loose extra weight easily.

e. **Prolonged Optimal Health:** Regular physical activity improves the strength, stamina and ability of organic system in the children.

Q3. Explain the Motor Development during the childhood?

Ans. Motor Development means “The development of movement and various Motor abilities from birth till death”. Motor development is progressive change in movement throughout the life cycle. As the matter of fact, the ability to move is essential to human development. Various Motor movements or Motor skills are essential for everyday life activities such as walking, Sitting, Running, Jumping, Catching or Holding, Throwing etc.

**Motor Development in Children**

1. **Early Childhood:** The period of early childhood starts from second year and continue till sixth Year. The motor development during this period takes place rapidly. It is know as Preschool years.

   a. In this period, a child becomes perfect in various fundamental movements such as Running, Jumping throwing & catching/holding ability to unite or combine this unit.

   b. Children stride length increases and they develop a more mature running pattern.
c. Proficiency in climbing on ladder become efficient
d. To hope and gallop skillfully
e. Fine eye hand coordination

2. **Middle Childhood:** The period of middle childhood starts from 7th year and continues up till 10th year. During this period the changes, which takes place are
   a. Children become more active & energetic
   b. Strong desire to engage in various physical movements and activities
   c. Good Eye-Hand-Leg coordination
   d. Better in balance and postures
   e. Motor skills are perfected and stabilized
   f. Coordinative abilities develop at the higher level while the flexibility develop at the slower level

3. **Late Childhood:** The period of late childhood begins from 11th year and continues upto 12th year or till The beginning of sexual maturation process. The no of changes take place during this period are
   a. Girls are temporarily taller and heavier than boys because of the earlier onset of Puberty.
   b. Strength begins to differ among the boys and girls
   d. Most of the children are master to most complex motor skills
   e. They learn strategies and more complex combination of motor skills
   f. Running and jumping movements, qualitatively and quantitatively develop at the faster rate Coaches and Teachers of Physical Education should continue to encourage skill development With an increasing stress on strategies and tactics.
Q4. Discuss the factors affecting Motor development in children?

Ans. The factors affecting Motor Development in Children are:-

I. Heredity:- Jeans are the small structure of body, which are responsible for various types of development of children. The working capacity of all organic systems are dependent on jeans.

The no of factors, which are transferred from parents to children are

a. Muscle fibres
b. Length of limbs
c. Working capacity of Cardio-vascular system
d. Bony structure
e. Inhered chronical diseases
f. Gender
CHAPTER-6

WOMAN AND SPORTS

Key Points:

- Sports participation of Women in India
- Special consideration (Menarche, Menstrual, Dysfunction, Pregnancy, Menopause)
- Female Athletes Triad (Anaemia, Osteoporosis & Amenorrhoea)
- Psychological Aspects of Women Athlete
- Sociological Aspects of Sports Participation
- Ideology

6.1 Sports Participation of Women in India

Reasons for the low rate of sports participation by women in India

1. Gender equity & social attitude
   a. No parental encouragement
   b. Traditional society
   c. Less motivation and inspiration
   d. Women constraining other women

2. Lack of plans and initiatives for sports women by the Government
   a. Male dominant culture
   b. Less availability of women coaches
   c. No independent games facilities for women
6. More emphasis on study

e. Less competition

3. Economic Factors

4. Social Customs and Rights

5. Low Health Consciousness

6. Stress on Academics

7. Media Coverage

8. Lack of Incentives & Career

6.2 Special consideration (Menarche, Menstrual, Dysfunction, Pregnancy, Menopause)

1. Menarche: “It is the first natural cycle and is a central event of female puberty”

2. Menstrual dis-function: Painful and irregular menstrual cycle of women to be on the rise with the decreasing involvement of the women in the physical fitness and endurance sports

3. Pregnancy: Pregnancy is the 9 months term, when women need to care and nurture the growing fetus till child birth. Heavy duty trainings, too much physical exercise and any kind of impact or injury to the women can harm the baby and mother

4. Menopause: Menopause marks the end of a woman’s reproductive era and is marked by the end of menstrual periods. The menopause leads to hormonal changes in the women’s body.

6.3 Female Athletes Triad (Anaemia, Osteoporosis & Amenorrhoea)

“A sports woman is too little or exercises beyond limit three interrelated illness may develop. These are called Female Athlete Triad”

1. Anaemia: Resulting from the inadequate nutrition

2. Osteoporosis: Low bone mass

3. Amenorrhoea: Absence of menstrual period for more than 6 months
The triad may cause a condition called “Stress Fracture”

6.4 Psychological aspects of women athlete
1. More goal oriented
2. Psychological stronger
3. Less aggressive
4. Fast adaptation
5. Image conscious
6. Poise & confidence

6.5 Sociological aspects of sports participation
1. Religious faith discourages woman participation in sports
2. Illeteracy in society
3. Biological inferiority
4. Male dominancy
5. Lesser concentration to develop woman sports equipment & facilities
6. Less competitive spectators for woman sports

6.6 Ideology
An ideology is a set of opinions or beliefs of a group or an individual
1. Overall development of the students(female)
   1. Support enhancing the literacy rate of female in society
   2. Increase incentives
   3. Proper plans and initiatives by the government for female
   4. Proper media coverage
   5. Encouragement from family and society
   6. Provide required equipment and facilities for talented sports women
7. Improve health consciousness for women

8. Equal competitive environment for academics and sports

2. **Environment**: Encouragement, love & security helps the children to take risk to explore fearlessly and to know more about their surroundings, which leads to a better sensory development, healthy environment and inter-personal relationship leads to a good personality of a child.

3. **Nutrientious food promotes good motor development**: Sensory and motor development depends on nutrition that the child gets to a great extent. Balanced nutritious food helps to develop stronger and healthier children.

4. **Opportunity for children**: Opportunity to play or gain knowledge give a better chance of developing sensory motor activities. Children get more opportunity to develop agility, balance, coordination, flexibility, strength and speed.

5. **Postural deformities**: Postural deformities may be caused due to some disease, accident or by birth. Children suffering from deformities of posture encounter hindrance in performing normal activity, therefore their motor development is impacted negatively.

6. **Sensory impairment**: Sensory impairment means senses like hearing, sight, speech etc. not functioning properly. Motor development is affected in children suffering from sensory impairment. For example: A child not able to hear finds difficulty to understand and follow instructions, which causes hamper motor development.

7. **Obesity**: Excessively over weight and obese children find it difficult to move properly or perform certain fine movements of body. They become slow and sluggish in movement. Therefore obesity has a negative Impact on motor development in children.

**VERY SHORT ANSWER TYPE QUESTION - (1 MARK EACH)**

Q.1 Define the following terms:

1. **Amenorrhoea**: It is the absence of menses for 6 months or absence of menstrual cycle for the three cycles.
2 Menorrhagia: It is heavier and increased amount of flow occurring at regular interval or loss of 80 ML or more of blood.

3 Metrorrhagia: Irregular episodes of bleeding

4 Menometrorrhagia: Longer duration of flow occurring at unpredictable intervals.

5 Anaemia: It is most common disorder of blood (i.e. deficiency of R.B.C.) generally caused by malnutrition.

Q.2 What is menstrual dysfunction?

Ans. Women engaged in physical activity and competitive endurance sports show increased incidence of menstrual dis-function delayed manacle and low body fat could be reasons for menstrual dis-function menstrual cycle occurs every 22nd to 35th day and the flow leads for 3 to 7 days. Due to blood flow the iron in blood depletes and because of this women with inadequate intake of dietary iron may suffer from anaemia.

Q.3 Briefly describe Menarche?

Ans. Menarche is the menstrual cycle. It can also be referred to the first menstrual bleeding in females. It is often considered a attainment of physical level and signals for possibility of fertility. Girls can experience menarche at different ages.

Q.4 What are the causes of early menarche?

Ans:

1. Increased incidence of childhood obesity.
2. Low birth weight.
3. Exposure to smoking (Mother or baby)
4. Children were not breast feed.
5. Higher conflicts in family relatives/Stress
7. Inadequate diet.
Q.5 What is anaemia? What are the causes of anaemia.

Ans. When no of red blood cells or concentration of haemoglobin in blood is low it is termed as Anemia. Hemoglobin is a protein inside the (Red blood cells) that contains Iron and transports oxygen to body parts.

Causes of Anaemia:

1. Acute bleeding
2. Stomach ulcers.
3. Stomach inflammations (Gastritis)
4. Cancer
5. Child birth
6. Menstruation
7. Surgery etc.
8. Inappropriate food-intake.

SHORT ANSWER TYPE QUESTION [80 TO 90 WORDS] - (3 MARKS EACH)

Q.1 How women’s participation in sports is beneficial? Discuss

Ans. Sports Priorities:

1. Higher level of confidence & self esteem.
2. Lower level of depression & cut pressure.
3. Positive body image, keeps you train & firm.
4. Psychologically more stronger than non participants
5. Hidden health benefits: strong body can fight illness.
6. Proper rest and nutrition; improves life.
7. Learn to take criticism.
8. Learns to deal with success and failure.
9. Discuss carrier and job opportunities.

Q.2 What are the constraints of women participation in sports?

Ans:
1. Lack of parental support and encouragement from family.
2. Social barriers and stigma in life.
3. Traditional values can wash out.
4. Religion or customs do not permit (Purda system).
5. Personal constraints and pressure from family.

Q.3 What is Menopause? What are the health Risk of Menopause?

Ans. Menopause is defined as the absence of menstrual period of 12 months or more. It is time before and after women’s last menstrual period. Abnormal bleeding, hot flashes with mood changes are general symptoms. Complications may develop with osteoporosis and heart disease. It is time when she can no longer become pregnant (carries stop functioning) changing hormone level during menopause can increase risk for depression in women.

Q.4 What exercises should be recommended during Menopause & Osteoporosis?

Ans. During Menopause the following exercises are recommended:

1. Cycling
2. Brisk Walking
3. Swimming
5. Yoga
In Osteoporosis: Muscles strengthening exercises.

1. Standing and rising on toes.
2. Lifting of weight.
3. Exercises with equipments—elastic bands & free weight wear.
5. Pilates-flexibility—to avoid risk of fracture.

**LONG ANSWER TYPE QUESTION (150 TO 200 WORDS) - (5 MARKS EACH)**

Q.1 What are the steps which should be taken to improve women's participation in sports in India?

Ans.

1. Motivation and inspiration to women for participation in sports.
2. Generating support from family and parents.
3. Organising camp, seminar and workshops.
4. Providing knowledge and media coverage.
5. Educating women and promoting sports at grass root level/local level/primary level.
6. Encouragement by senior players.
7. Providing better infrastructures and facilities.
8. Ensuring safety and security to women.
11. More opportunities for tournaments.
12. Create better and right environment.
14. Build physical and psychological strength.
(15) Healthy and Balanced diet

(16) Allowance incentives and rewards

(17) Give stipends/scholorship/Monetary/Economic help

(18) Help in domestic constraints

(19) Change in attitude and perception at village level.

(20) Equality and community mobilizing.

Q.2 Why exercises are necessary during Pregnancy?

Ans. Keeping both your body and mind fit, during pregnancy is so much important that exercise will help you do both. During pregnancy everyone gets stressed and anxious. Women have to remain active for fit pregnancy and regular exercises will help in doing so. Exercises build up tolerance power and improves suppleness and strength. Blood circulation improves and it can help you ease at tensions. Whenever you do exercises it should be in your limits and range. During exercise hormones called “ENDOR PITTONS” released which makes us feel good and high and gives emotional lift too. With exercises you have more energy and less of backaches, Cramps and breathlessness. During pregnancy go for stretching, upper bending and squiching exercises. Less exercises for pelvic region. Exercises should be followed by proper rest, relaxation and massage to make comfortable.

Warning [Excercising the right way is ‘MUST’ under the guidance of Professional]

Q.3 Explain female athlete triad, caused by excessive exercises and dieting?

Ans. Exercising is good for all age group of females. While exercising they start focusing on being slim and light weight. These athlete, girls should be educated by sports professional, coaches or experts regularly. The three aspects of female triad are:

3. Osteoporosis - Low bone density.

**Anaemia** - The females, who work out intensively to be slim and trim, has to take required amount of proteins, carbohydrates fat and other nutrients
to maintain balance between work out and exercising depending upon the intensity and level of stream the calorie needs must be maintained one should have full and complete diet, so that all nutrients are received by body.

**Amenorrhoea** - Due to hormonal changes, low calories intake, stress etc. can cause amenorrhea while engaged in stressful activities one should give due importance to it. During physical activity and competition demand of body increase and in coping up with demand high energy diet full of all nutrient must be taken to meet the demand. Diet and activity should and strain on body and these is no hormonal imbalance.

**Osteoporosis** : During exercising growth and development take place, strength of bone and muscles also improves. Female should take rich protein diet full of vitamin and minerals especially calcium. Muscle skeletal injuries are common in female who have amenorrhea. Female who develop recurrent shin pain or stress fracture should consider full hormone profile & dietary analysis and a bone mineral density list or assessment.

Q.4 Explain in details the psychological failures affecting women’s participation in sports.

**Ans.** Customs, tradition and religion have inflamed the psychological aspects of women personality. Female have more of poise and confidence than males. Women are more concerned about their images. Females/women are psychologically considered better in term of personality development.

Self image and self concept play vital role in any females life. How females feel about their body structure, their looks and their personality is very important. This will determine their self esteem and over all development.

After reviewing literature it can be concluded that normal females (non-sports person) different in personality profiles from success full female athletes. These girls have better cognitive understanding and approach than common girls or woman who did not participate in games participation in sports or any extra curricular activity has resulted in positive psychological development of females. The activities provide avenue for demonstrating competence experiencing achievements, developing identities and forming relationship with press and society.

Female athletes exhibit the personality traits like assertive achievement oriented, dominant, self sufficient independent aggressive and intelligent.
Specific personality type a profile development by participation in different games & sports.

The girls who participate in sports or physical activity levels to be or have higher self esteem, they are more mentally strong, more disciplined, energetic healthier, more tough & bold, much more confident & balanced, high risk taker and more active in life.

Q.5 Discuss sociological aspects of sports participation of women in India?

Ans. The role of women in sports has been continuously changing from the past. During the last few years it has been observed that a fairly good number of female athlete participate in sports & games increased in India.

In 1896, during the modern Olympus there were No. of females participation later by 1932 Olympic it first rose to 4%.

As the no. of participation has increased at all (schools, colleges & national level). It has been diminishing there social, psychological barrier as well as legislative.

Many studies new indicate that parental support acceptance and family understanding has changed the attitude & negative implications, has helped females to be at par with males in their sports life. Woman are now socially accepted in society.

Research suggest that sports can be invigileting and a personally empowering experience for girls and women. Being a skilled athlete change the way women, looks at her self. She makes herself physically stronger, socially more accepted and competent and more in control of her life as an independent individual. This is important two become social life is often organised in a way that leads women to see them selves as weak, dependent and powerless.

It provides opportunities to reconnect with the power of their own bodies sports participation helps women to overcome the feeling that their bodies are OBJECTS.

Physical strength gained through participation in sports may go beyond help a women to feel fit, make her loss vulnerable, more dependent and more in control of her physical safety and social and psychological well being reports have shown evidences that by participation in sports:
**Women strength:**

**Physical** - Lower size of obesity lower size of heart and other chromic diseases and less of osteoporosis

**Psychological** : Higher self esteem better body image, reduces stress and depression and enhanced same of competence and control.

**Academic** : Better grades higher standardize test scores and lower risk of dropping out of school.

**Social** : More acceptable better understanding & cooperation better leadership, qualities shares more responsibilities & better inter-personal relationship in family.
CHAPTER-VII

TEST & MEASUREMENT IN SPORTS

Key Points:

- Measurement of Muscular strength-Kraus-weber test
- Motor Fitness Test-AAPHER
- Measurement of Cardio-Vascular Fitness-Harward Step Test/Rock Port Test
- Measurement of flexibility-Sit & Reach Test
- **Rikli Jones-Senior Citizen Fitness Test**
  1. Chair stand test for lower body strength
  2. Arm curl test for upper body flexibility
  3. Chair sit & reach test for lower body flexibility
  4. Back-scratch test for lower body flexibility
  5. Eight foot up & go test for agility
  6. Six minute walk test for aerobic endurance

7.1 Measurement:- Measurement refers to the process of administrating a test to obtain a quantitative data. It can also be said that the measurement aids evaluation process in which various tools and techniques are used in the collection of data.

“Measurement is a process by which the level of performance, fitness, ability, Knowledge, personality and skills are measured with the help of various standard Tests”.
Importance of Measurement in Physical Education & Sports.

- To know about the progress
- Individual centered training program
- Helps in selection of athletes
- To study the development of athletes
- Motivation of an athlete
- To predict in advance the performance potentials
- To prepare norms and standards
- To measure current fitness status
- To achieve goals and objectives of the activity
- To conduct research

7.2 Measurement of Muscular strength-Kraus-weber test:-

The six items of the Kraus-Weber Muscular Strength Test:

1. Strength of abdominal plus psoas muscles
2. Strength of abdominal minus psoas muscles
3. Strength of psoas and lower abdominal muscles
4. Strength of upper back muscles
5. Strength of lower back muscles
6. Floor touch test

Hans Kraus had devised these tests after Fifteen Years of close study of individual cases. A battery by six tests was prepared. The purpose of the tests was the measure Minimum muscle power necessary for healthy living. Because this is a Minimum Test, one should be able to perform all six parts. The tests are as follows:

1. Position : Lie down on back, legs straight, feet held down, hands behind neck. The examiner holds down the feet and the student rolls to a sitting position.
2. **Position**: Lie down on back, Knees bent, Feet held down, Hands behind back.

3. **Position**: Lie on back, hands behind neck.

**Action**: Lift both legs up 8 to 10 inches from floor hold for a count of 10 seconds.
4. **Position**: Lie face down. Place small pillows under hips. Lower body held down, hands behind neck.

![Image](image1.png)

5. **Position**: Lie face down, Place small pillow under hips, Upper body held down, head resting on hands.

**Action**: Lift upper body off floor and hold for a count of 10 seconds.

![Image](image2.png)

6. **Position**: Stand feet together, knees straight.

**Action**: Bend slowly forward and see how close you can come and touch the floor. If you can touch, measure distance from finger to floor. If you can touch, hold for count of three, If you can’t touch, measure distance from finger to floor.

The above tests are considered useful and preferable from the point of view of equipment as well as time.
7.3 Motor Fitness Test-AAPHER (American Alliance for Physical Health Education & recreation)

<table>
<thead>
<tr>
<th>Test Items</th>
<th>Parts of Body-Physical Fitness Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pull up (boys)</td>
<td>1. Muscular strength or endurance of arm &amp; shoulder</td>
</tr>
<tr>
<td>2. Flexed arm hang (girls)</td>
<td>2. Muscular strength or endurance of arm &amp; shoulder</td>
</tr>
<tr>
<td>4. Shuttle run (boys &amp; girls)</td>
<td>4. Speed and Agility</td>
</tr>
<tr>
<td>5. Standing broad jump (boys &amp; girls)</td>
<td>5. Explosive strength of legs</td>
</tr>
<tr>
<td>6. 50 yard dash</td>
<td>6. Speed of lower extremities'-explosive strength</td>
</tr>
<tr>
<td>7. 600 yard or 9 minute run &amp; walk</td>
<td>7. Cardio-vascular endurance</td>
</tr>
</tbody>
</table>

The AAPHER—Youth Physical Tests were created in 1957. During the years 1957-58 these tests were applied to 8500 School Children of classes 5 to 8 in the United States of America. On the basis of this study standard rooms were created. Studies were conducted on 2200 College level students in 1960 and percentile rooms were created. Similarly Percentile rooms were created on the basis of studies belonging to 50 institutions. New percentile rooms were created again in 1965 on the basis of age. This study included 9200 boys and girls in the 10 to 17 years age group.

1. Pull Ups Boys is an activity meant only for boys:

**Equipment:** A metal or wooden bar approximately 1 1/2 inches in diameter is preferred. A doorway gym bar can be used and if no regular equipment is available, a piece of pipe or even rungs of a ladder can serve the purpose.

**Description:** The bar should be high enough so that the pupil can hang with his arms and legs fully extended and feet free from the floor. He should use the overhand grasp. After coming in hanging position, the pupil raises his body by his arms until his claim can be placed over the bar. Then he lowers...
his body to a full hang as in starting position. The exercises is repeated as many times as possible.

Rules

(i) Each Student will be allowed one trial.

(ii) The body must out swing during the execution of the movement.

(iii) The knees must not be raised and the kicking of legs is not permitted.

Scoring: Record the number of completed Pull Ups.

2. Flexed Arm Hang: This activity is meant only for girls.

Equipment: A horizontal bar is used. The okameter of the rod ought to be 1½ inches. A stop watch is needed is record time.

Description: The height of the bar should be adjusted so it is approximately equal to the pupil’s standing height. The pupil should use an overhang grasp. With the assistance of two spotters, one in front and one in back of Pupil the Pupil raises her body off the floor to a position where the Chin is above the bar, the elbows are flexed and the Chest is close to the bar. The Pupil holds this position as long as possible.
Rules:

(1) The Stopwatch to started as soon as the Subject takes the hanging position.

(2) The watch is stopped when:

   (i) Pupil’s Chin touches the bar

   (ii) Pupil’s head hits backward to keep Chin above the bar.

   (iii) Pupil’s Chin falls below the level of the bar.

3. Sit-Ups (Flexed Leg), Boys and Girls

Scoring: The length of time the subject holds the hanging position will be recorded in seconds. Sit-ups (flexed leg)

Equipment: Clean floor, Mat or Dry Turf and Stop-Watch.

Description: The Pupil lies on his back with his knees bent, feet on the floor and heels not more than 12 inches from the buttocks. The angle at the knees should be less than 90 degrees. The Pupil puts his hands in the back of his neck with fingers clasped and places his elbows squarely on the mat, floor and turf. His feet are held by his partner to keep them in touch with surface. The Pupil heightens his abdominal muscles and brings his head to knees. This action constitutes one sit up. The number of correctly extended Sit ups performed in 60 seconds shall be the score.
Rules:

(1) No rectory is permitted between sit ups.

(2) Keep the fingers clasped behind his neck.
   
   (a) Keep the fingers clasped behind his neck.
   
   (b) Bring both elbows forward in starting to sit up without pushing off the floor with an elbow.
   
   (c) Return to starting position with elbows flat on the surface before sitting up again.

Scoring: Only the Sit ups a pupil is able to do in 60 Seconds are recorded.

4. Shuttle Run (Boys and Girls):

Equipment: Two blocks of wood, 2 inches x 2 inches x 4 inches and a stopwatch. Pupils must wear sneakers or run bare footed.

Description: Two parallel lines are marked on the floor 30 feet apart. The width of a regulation Volleyball Court serves as a suitable area. Place the blocks of wood behind one of the lines.
The pupil starts from behind one of the lines. On the signal “Ready” or “Go” the pupils runs to the blocks, picks one up runs back to the starting line and places the block behind the line. He then runs back and picks up the second block which he carries back across the Starting Line.

**Rules:** Allow two trials with some rest between.

**Scoring:** Record the time of the better of the two trials.

**5. Standing Broad (Long) Jump:**

**Equipment:** Mat, Floor or Outdoor Jumping pit and Tape Measure.

**Description:** Pupil stands with the feet several inches apart and the toes just behind the take off line. Preparatory to jumping, the pupil swings the arms backward and bends the knees. The jump is accomplished by simultaneously getting bending the knees and swinging forward the arms.

**Rules:**

(1) Allow three trials.
(2) Measure from the take off line to the feet or other part of the body that touches the floor nearest the take off line.

**Scoring:** Record the best of the three trials.

**6. 50 Yards Run (Boys and Girls):**

**Equipment:** Two stop watches or one with a split second times.

**Description:** It is preferable to administer this test to two pupils at a time. The starter will use the commands: “Ready” and “Go” the race comes to an end at the “Finishing Line”. Rules, the stop watch is kept on from the word “Go” to the finishing line, a time is recorded to the one tenth of a second.

![Diagram of 50 Yards Run](image)

**7. Soft-Ball Throw (Boys and Girls):**

**Equipment:** Soft Ball 12, Measure Tape.

**Description:** Game is played in a football field on a field of similar size. Lines are drawn at a distance of five yards each. The pupil who throws the ball can throw from a distance of 6 feet.

![Diagram of Soft-Ball Throw](image)
Rules:

(1) It is necessary to have the ball in one hand.

(2) Three chances are given to each player.

Scoring: Best of the three throws is counted.

8. 600 Yards Run or Walk (Boys and Girls)

Equipment:

1. A Track 2. A Stop Watch

Description: Pupils take their positions at the standing start. The race starts with command words: “Ready” and “Go”. As many as Six Pupils can participate at a time.

Rules: Walking is permitted but the object is to cover the distance in shortest possible time.

Scoring: Record in Minutes and Seconds.

7.4 Measurement of Cardio-Vascular Fitness-Harward Step Test/Rock Port Test

1. Harward Step Test-Aerobic Fitness (Recovery time)

\[ 100 \times (\text{Total test time in seconds (the time for which the athlete was able to do the stepping up and down)}) \]

\[ 2 \times (\text{the total number of heartbeats for all the three time intervals}) \]

2. Rockport Fitness Test-One mile Walking test

\[ \text{VO}_2\max = 132.853 - (0.0769 \times \text{Weight}) - (0.3877 \times \text{Age}) + (6.315 \times \text{gender}) - (3.2649 \times \text{time}) - (0.1565 \times \text{Heart Rate}) \]

Harvard Step Test

Harvard Step Test: Brouha (1943) constructed a very simple and promising field test for measuring cardiovascular endurance of human beings by using easily available and inexpensive equipment.

Equipment: A stopwatch, 20-inch high bench, metronome or tape recorder (optional), stethoscope (optional).

Test Administration: The tester gives a demonstration of the stepping up style to be followed by the subjects during the test. If the metronome is
available, it is set to a speed of 120 beats per minute. Depending upon the availability of 20-inch high bench area and pulse count testers, a group of 1 to 4 subjects may be asked to start the stepping up and down exercise in consonance with the sounds of metronome and by starting the stopwatch at the signal ‘go’. If the metronome is not available, then the tester should do enough rehearsal of counting the pace up-up-down-down, 30 times a minute. The subject is given instructions that on the command ‘up’ or the first sound of the metronome, he/she should place one foot on the bench; on the second command ‘up’ or the second sound of the metronome, he/she should place both feet fully on the bench with the body erect straightening the legs and back.

Immediately after reaching the erect posture, she should step down one foot at a time as the tester gives command ‘down-down’ (third and fourth sounds of the metronome). The subject is instructed to repeat the stepping up and down exercise in the above manner for five minutes at the pace of 30 steps per minute. The subject is also asked to take off and step-down with the same foot each time. The tester starts the stopwatch simultaneously with the first take off by the subject/subjects and stops the watch after exactly five minutes by giving the ‘stop’ signal to the subjects who immediately sit down on the bench. In case, any subject stops the exercise or slows down the pace of the exercise due to fatigue or exhaustion, his or her duration of exercise performed at the correct pace is noted (in seconds) and is asked to stop and sit down. Exactly one minute after the exercise, the tester starts counting the pulse rate and records the same for the duration from 1 to 1.5, 2 to 2.5 and 3 to 3.5 minutes.

**Scoring:** The pulse of all the 3 half minute counts recorded are added together and a fitness index is calculated by the following formula:

\[
\text{Fitness Index (F.I.)} = \frac{\text{Duration of exercise period in seconds} \times 100}{2 \times \text{sum of three pulse counts after exercise}}
\]

**7.5 Measurement of flexibility-Sit & Reach Test**

1. Test for absolute flexibility
2. Test of Relative flexibility
   a. Measure of linear flexibility test
   b. Rotary (Angular measure flexibility test)
I. Sit and Reach Test: This test is used to measure the flexibility of the back and leg (hamstring muscle). It is a kind of absolute and linear test of flexibility.

Equipment: A testing box or a flexomeasure and a yardstick.

Procedure: The subject is asked to remove shoes and place his/her feet against the testing box while sitting on the floor with straight knees.

Now the subject is asked to place one hand on top of the other so that the middle finger of both hands are together at the same length. The subject is instructed to lean forwards and place his/her hands over the measuring scale lying on the top of the box with its 10 inch mark coinciding with the front edge of the testing box. Then, the subject is asked to slide his/her hands along the measuring scale as far as possible without bouncing and to hold the farthest position for at least one second.

Score: Each subject is given three trials and the highest score nearest to an inch is recorded and 10 inches are subtracted from the recorded reading to obtain the flexibility score which is compared with the standards given in.

Table source: Based on personal experience.

Validity: This test only measures the flexibility of the lower back and hamstrings, and is a valid measure of this.

Reliability: The reliability of this test will depend on the amount of warm-up that is allowed, and whether the same procedures are followed each time the test is conducted. Most sit and reach testing norms are based on no previous warm-up, though the best results will be achieved after a warm up or if the test is proceeded by a test such as the endurance test which can act as a warm up. If a warm up is used, it is important to have a standardized
warm up and test order and repeat the same conditions for each time the test is conducted.

**Advantages:** The sit and reach test is a common test of flexibility, and is an easy and quick test to perform. If using the standard testing procedure, there is a lot of published data to use for comparison.

**Disadvantages:** Variations in arm, leg and trunk length can make comparisons between individuals misleading. This test is specific to the range of motion and muscle and joints of the lower back and hamstrings, and may not be relevant to other parts of the body.

7.6 Rikli Jones-Senior Citizen Fitness Test

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Parts of Body-Physical fitness components</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chair stand test for lower body strength</td>
<td>1. Lower body strength, leg strength &amp; Endurance</td>
</tr>
<tr>
<td>2. Arm curl test for upper body flexibility</td>
<td>2. The upper body strength, arm flexor, strength &amp; endurance</td>
</tr>
<tr>
<td>3. Chair sit &amp; reach test for lower body flexibility</td>
<td>3. The hemi string and lower back flexibility</td>
</tr>
<tr>
<td>4. Back-scratch test for lower body flexibility</td>
<td>4. The upper body flexibility of the body &amp; range of motion of the shoulders</td>
</tr>
<tr>
<td>5. Eight foot up &amp; Go test for agility</td>
<td>5. The motor agility, speed &amp; balance</td>
</tr>
<tr>
<td>6. Six minute walk test for aerobic endurance</td>
<td>6. Cardio-vascular endurance &amp; recovery</td>
</tr>
</tbody>
</table>

(a) Chair Stand test for lower body strength

**Purpose and Daily Benefit:** The purpose of the Chair-Stand is to measure the strength of lower body of adults over 60 years of age. Lower body strength is important for activities such as getting out of a chair, on the bus, out of the car, and rising up from a kneeling position in the house or garden. The, strength of your lower body can directly affect the ease with which you perform the activities you do every day.

**Equipment:** Chair without arms, Stopwatch.
**Procedure:** Place the chair against a wall where it will be stable. Sit in the middle of the chair with your feet flat on the floor, shoulder width apart, back straight. Cross your arms at the wrist and place them against your chest. The test partner will tell you when to begin and will time you for 30 seconds, using the stopwatch. You will rise up to a full stand and sit again as many times as you can during the 30 second interval.

(a) Each time you stand during the test be sure you come to a full stand.

(b) When you sit, make sure you sit all the way down. Do not just touch your backside to the chair. You must fully sit between each stand.

(c) Do not push off your thighs, or off the seat of the chair with your hands to help you stand unless you have to.

(d) Keep your arms against your chest crossed and do not allow the arms to swing up as you rise.

(e) If you are on your way up to stand when time is called you will be given credit for that stand.

**Scoring:** The score is the number of completing correct chair stands in 30 minutes.

**Arm Curl test for upper body strength**

**Purpose:** This test measures upper body strength and endurance.
Equipments Required: 4 pound weight (women, AAHPERD), 5 pound weight (women, SFT), 8 pound weight (for men). A chair without armrests, stopwatch.

Procedure: The aim of this test is to do as many arm curls as possible in 30 seconds. This test is conducted on the dominant arm side (or strongest side). The subject sits on the chair, holding the weight in the hand using a suitcase grip (palm facing towards the body) with the arm in a vertically down position beside the chair. Brace the upper arm against the body so that only the lower arm is moving (tester may assist to hold the upper arm steady). Curl the arm up through a full range of motion, gradually turning the palm up (flexion with supination). As the arm is lowered through the full range of motion, gradually return to the starting position. The arm must be fully bent and then fully straightened at the elbow. The protocol for the AAHPERD test describes the administrator's hand being placed on the biceps, and the lower arm must touch the tester's hand for a full bicep curl to be counted. Repeat this action as many times as possible within 30 seconds.

Scoring: The score is given for the total number of controlled arm curls performed in 30 seconds.

(c) Chair Sit and Reach test for Lower Body Flexibility

The Chair Sit and Reach test is a part of the Senior Fitness Test Protocol, and is designed to test the functional fitness of seniors. It is a variation of the traditional sit and reach flexibility test.

Purpose: This test measures flexibility of lower body.
Equipments Required: Ruler, straight back or folding chair, (about 17 inches/44 cm high)

Procedure: The subject sits on the edge of a chair (placed against a wall for safety). One foot must remain flat on the floor. The other leg is extended forward with the knee straight, heel on the floor, the ankle bent at 90°. Place one hand on top of the other with tips of the middle fingers even. Instruct the subject to inhale, and then as they exhale, reach forward towards the toes by bending at the hip. Keep the back straight and head up. Avoid bouncing or quick movements, and never stretch to the point of pain. Keep the knee straight, and hold the reach for seconds. The distance is measured between the tip of the Chair sit & reach test for lower body flexibility fingertips and the toes. If the finger tips touch the toes then the score is zero. If they do not touch, measure the distance between the fingers and the toes (a negative score), if they overlap, measure by how much (a positive score).

Scoring: Perform two trials. A score is recorded to the nearest inch or 1 cm as the distance reached, either a negative or positive score. Record with leg was used for measurement.

(d) Back Stretch for Upper Body Flexibility

Aim: The Back Scratch Test measure flexibility of your upper body. Upper body’s flexibility affects your ability to reach for items that may be high on a shelf, change a light bulb, or do any activity that requires arm and/or shoulder movement. Maintaining flexibility in your upper body will assist you in continuing to live independently.
Equipment: Ruler

Procedure: Place your left arm straight up in the air above your left shoulder. Bend your left arm at the elbow to reach toward your back, with your fingers extended. Your elbow pointed toward the ceiling. Place your right hand behind your back with your palm out and your fingers extended up. Reach up as far as possible and attempt to touch the fingers of your two hands together. Some people are not able to touch at all, while other’s fingers may overlap. Take two practice stretches with each arm, determining which side is more flexible. You will be measuring and recording only your most flexible side. You are now ready to be measured. Perform the stretch as outlined above. Without shifting your hands your test partner will position your fingers so that they are pointing toward each other.

Scoring: The distance between the finger tips of one hand and ther other is measured to the nearest half inch or centimeters. If your fingers overlap, the amount of the overlap will be measured. Fingertips just touching receive a score of “0”. If your fingers do not touch, you receive a negative score of the distance between your fingers, measured to the nearest half inch or centimeters.

(e) Eight Foot Up and Go Test for Agility

Aim: The ‘8 Foot Up and Go’ is a coordination and agility test for the elderly, which is a part of the Senior Fitness Test. This test measures speed, agility and balance while moving.

Equipments required: Stopwatch, straight back or folding chair (about 17 inches/44 cm high), one marker, measuring tape, area clear of obstacles.
**Procedure:** Place the chair next to a wall (for safety) and the marker 8 feet of the chair. Clear the path between the chair and the marker. The subject starts fully seated, hands resting on the knees and feet flat on the ground. On the command, “Go,” timing is started and the subject stands and walks (no running) as quickly as possible (and safely) to and around the cone, returning to the chair to sit down. Timing stops as they sit down.

![Diagram of the test setup](image)

**Purpose:** To assess aerobic fitness or aerobic endurance which is important for walking distances, stair climbing, shopping and sightseeing etc.

**Equipment:** Stop watch.

Rectangular ground measuring 20 x 5 yds.

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**VERY SHORT ANSWER TYPE QUESTION - (1 MARK EACH)**

Q.1 What is test?

Ans. Test, may be called as tool, a question, set of question, an examination which use to measure a particular characteristic of an individual or a group of individuals.
Q.2 What is measurement?

Ans. According to R.N. Patel

“Measurement is an act or process that involves the assignment of numerical values to whatever is being tested. So it involves the quantity of something.”

Q.3 What do you understand by muscular strength?

Ans. It is the amount of force the muscle or a group of muscles can exert against resistance for short duration as in anaerobic activities.

Q.4 What is Kraus-Weber test?

Ans. It is mean to test minimum general fitness required by an individual by testing the strength and flexibility of big muscles and joints.

Q.5 What is motor fitness?

Ans. Motor fitness is a person's ability to perform physical activities.

Q.6 What do you understand by cardiovascular fitness?

Ans. 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 oxygen to produce energy for movement.

Q.7 What do you understand by Harward step test?

Ans. It is a cardiovascular fitness test. It is good for measurement of fitness and the ability to recover after a strenuous exercise.

Q.8 What is Rockport one mile test?

Ans. It is cardio respiratory test used to determine VO2 max. (volume of oxygen) VO2max is the maximum capacity of the person’s body to move and use oxygen during exercise.

Q.9 What do you understand by flexibility?

Ans. Flexibility is the range of motion in a joint or group of joints, or, the ability to move joints effectively. Flexibility is related to muscle strength.
Q.10 What do you understand by senior citizen fitness test?

Ans. Senior citizen fitness test are easy to understand and effective tests to measure aerobic fitness, strength and flexibility using minimum and inexpensive equipments.

Q.11 Why measurement is necessary?

Ans. It is something which provides information regarding individual's ability, knowledge, performance and achievement.

Q.12 By which test the one can measure abdominal strength?


**SHORT ANSWER TYPE QUESTION [80 TO 90 WORDS] - (3 MARKS EACH)**

Q1. What do you understand by AAHPER test? Describe any two items of the test.

Ans. The AAHPER youth fitness test was formed in 1965 in United States. This test administered on school student of 17 year age. This test was designed to help the physical education teachers and other recreation leaders in the field to find out the performance levels of their students, compare them with national norms.

**Administration of test**

1. **(a) Pull-ups(boys):** This test measures the total number of repetitions performed without taking rest on a horizontal bar. The total number of pull-ups noted. In this test, the chin must reach above the bar while doing pull-ups.

   **(b) Flexed-arm hangs (girls):** This is test is administered on an adjusted on an adjustable horizontal bar. The height of the bar should be adjusted so that it is approximately equal to the standing height of the student. With the help of two girls the student's body is lifted off the ground until her chin is positioned above the bar. The student holds this position as long as possible. Her time is noted in seconds. She may be allowed for one trial.
2. **Flexed-leg sit-ups**: The student is advised to lie on floor on his/her back keeping knees bent. The angle of knee: around 90 degree. The feet are held by partner. The student should put fingers locked and put behind the head curls up and touches the elbows to knees the score is counted as maximum number of sit-ups in 60 seconds.

Q2. Describe any three tests in Kraus-Weber test.

This very test of fitness was firstly used to investigate about the progress of the treatment given for back pain problems. More than eighty who take this test failed to pass it in the first attempt.

![Illustration of Kraus-Weber tests]

The first test of the six Kraus-Weber tests series is used to evaluate general fitness of a person. In this test one has to keep the feet on the ground: do sit ups while keeping both hands folded on the back and lying body on the ground.

The second part of Kraus-Weber Test series is similar to first in posture but only change is that in this test knees of person are folded and the ankles are as close to buttocks as possible; while doing sit ups.
The third part of Kraug-Weber Test series requires the person to lie flat on the back and keeps hands behind the neck and legs remain straight and lifted up for about ten seconds in a stretch.

Q3. Explain administration of Rockport one mile test.

Ans. Administration of Test: (i) Choose a windless day to conduct the test, (ii) Record your weight in pounds (lbs) (iii) Walk one mile (1609 mt) as fast as possible, (iv) Record the time to complete the one mile walk, (v) Immediately on finishing the walk record your heart rate (beats per minute), (vi) Determine your maximum cardio-respiratory ability (VO2) from the calculation given below. Calculation procedure: Analysis of the result is done by comparing it with the result of previous test. It is expected that, appropriate training between each test should be done to show improvement. The formula used to calculate VO2 Max is: 132.853 - (0.0769 × weight) - (0.3877 × Age) + (6.315 × Gender) - (3.2649 × Time) - (0.1565 × Heart rate) Where:

(a) Weight is in pounds (lbs),
(b) Gender: Male - 1 and Female = 0
(c) Time is expressed in minutes and seconds,
(d) Heart rate is in beats/minute
(e) Age in years.

Ans. **The Harvard Step Test** is a method used to assess cardio-respiratory fitness, which was developed by Brouha et al. (1943) in the Harvard Fatigue Laboratories during World War II. It is based on heart rate recovery following a given work load of 5 minutes or until exhaustion.

**What do we need?**
- A gym bench or box. 20 inches high.
- A stopwatch
- Cadence
- An assistant

**SCORING THE TEST**

There are two versions of the Harvard Step Test, the short form and the long form.

- **Short Form Equation** - Fitness Index = \((100 \times \text{test duration in seconds}) \div (5.5 \times \text{pulse count between 1 and 1.5 minutes})\).

- **Long form Equation** - Fitness Index = \((100 \times \text{test duration in seconds}) \div (2 \times \text{sum of heart beats in the recovery periods})\).

Q5. Discuss the back scratch Test for upper body flexibility.

Ans. You’ll need a ruler or a yardstick. Place your hand over your shoulder, and reach as far as possible down the middle of your back, your palm touching your body. Place your other arm behind your back, palm facing outward and reach up as far as possible attempting to touch or overlap the middle fingers of both hands. Practice two times, and then test two times. Your partner measures the distance between the tips of the middle fingers to the nearest half-inch. If the fingertips touch, score zero. If they do not touch, score a negative distance, such as 2 inches. If they overlap score a positive distance, such as - 1 inch. Take your best score. For women the goal is to have your fingertips no more than 5 inches apart and for men no more that 8 inches apart. If you’re unable to reach this goal. You may be at risk for losing the ability to form some activities that require upper body flexibility. Stop the test if you experience pain.
Q6. Discuss in short sit and reach test.

Ans. The sit and reach test is a common measure of flexibility, and specifically measures the flexibility of the lower back and hamstring muscles.

**Equipment**

- ruler, step (optional, you could make your own sit and reach box if keen too) After a brief warm up the subject sits on floor with shoes off. Subject places bottom of feet (10 to 12 inches apart) against side of box (approximately 12” or 30 cm high) with knees straight. Tester places measuring stick on box parallel to subjects legs; 15” or 38 cm at edge of box closest to subject and end of measuring stick (“o”) toward subject. Subject places hand over hand and reaches as far as possible over measuring stick without bending knees. Best of three tries is recorded.

Q7. What is the importance of measurement in physical education and sports? Write in your own words.

Ans. Physical education and sports is a big area. It has no end. Without doing any test, measurement is not possible. Till we do not evaluate the results, the measurements are useless. In physical education and sports use of test and measurement is important due to reasons given below:

1. Selection of athlete
2. Classification of individual games
3. To Study the development of athletes
4. The person-centered training program
5. Motivate athletes
6. Potential performanc
7. The criteria and standards to be created
8. Measuring current capacity
9. To do research
10. To achieve objectives & goal of the activity.
UNIT 8

PHYSIOLOGY AND SPORTS

Key Points:

1. Gender differences in Physical and Physiological parameters

2. Define Physiology & Physiological factors determining component of Physical fitness

3. Organic system of Human Body

4. Physical Fitness & its component

5. Effects of exercises on different Organic System
   (a) Cardio-Vascular System
   (b) Respiratory System
   (c) Muscular System.

6. What is meant by Ageing? Explain the followings:-
   (a) Physiological changes due to ageing
   (b) Contribution of exercise to maintain functional fitness in aged population

8.1 Gender Differences in Physical & Physiological parameters

Gender the state of being male & female through bio-logical division of an organism on the basis their reproductive systems.”
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### 8.2 Physiology & Sports Physical Fitness

(Strength, Speed, Endurance, Flexibility, Coordination and Agility)

- Physiological parameter

- Cardio-Vascular system
  (Heart, Blood Vessels, Blood, Lymph, Lymphatic vessels & Glands)

### 8.3A MUSCULAR SYSTEM

- Muscles composition
- Muscles fibres
- Muscles size & mass

### RESPIRATORY SYSTEMS

- Lungs

### CIRCULATORY SYSTEM

- Heart
- Blood
- Blood vessels
8.3B Factors affecting in Physical & Physiological fitness

1. Regular Exercise
2. Heridity
3. Proper Training
4. Environment
5. Profession
6. Diseases, illness, Weakness & Injury
7. Age & Gender
8. Diet
9. Stress & tension
10. Health Hazards
11. Rest and Relaxation
12. Posture

Gender
“The state of being male & female

8.4 Physiological factors determine components of Physical fitness

Physiology means, “The science dealing with the functions of living organism [A Branch of biology that deals with the functions of organs, tissues and cells of an organism (living)]
Physiological Factors

**Biological Factor:**
- Heredity
- Stress & tension
- Age & gender
- Posture
- Health problem
- Infection

**Physical Factors**
- Environment
  - a. Physical
  - b. Social
- Exercise
- Balance diet
- Life style
- Drugs & alcohol
- Smoking
- Rest, relaxations
  - recreation

**Organic System:**
- Skeletal system
- Digestive system
- Muscular system
- Respiratory system

- Endocrine system
- Reproductive system
- Nervous system
- Circulatory system
- Excretory system

8.4 “Physical Fitness is the total functional capacity of an individual to perform a given task effectively, without undue fatigue”
Components of fitness

Health Related
- Body Composition
- Cardio-vascular fitness
- Flexibility
- Muscular endurance
- Muscle strength

Skill Related
- Agility
- Balance
- Coordination
- Power
- Speed
- Reaction time

Physiological
- Fitness of organic system
- Metabolic fitness
- Morphological fitness
- Bone integrity

Sports Related
- Individual sports a,
  Optimizing fitness with sound personality
- Team game
- Social & emotional stability

8.5 (a) Effect of Exercise on Cardio-Vascular System

Cardio Vascular system means to deliver oxygen and nutrients to the body parts to Produce energy & remove waste material from it

Effects of exercise

Immediate effects
- Increase heart rate
- Increase breathing rate
- Increase blood flow in the body
- Increase blood pressure
- Increase cardiac output
- Increase in stroke volume

Long term effects
- Decrease in basic heart rate
- Increase the efficiency of heart rate
- Increase in heart size
- Increase cardiac output
- Increase no of capillaries
- More effective blood distribution
- Increase blood volume
- Decrease cholesterol level
- Fast recovery period
- Delay fatigue
- Increase in stroke volume
8.5 (b) Effects of Exercise on Respiratory system

“Respiratory system is a mechanism to take oxygen inside and throw away carbon dioxide’

**Respiration:**- It is the process of oxygen supply to the cell for the Oxy-dative energy from the nutrients and transport of carbon dioxide and the waste material from the cell

Organ of respiratory system-

1. Nose
2. Pharynx
3. Trachea
4. Bronchi
5. Bronchioles
6. Lungs

**Effects of exercise**

- Improve tidal volume
- Improve vital capacity
- Faster recovery rate
- Improve gas exchange capacity
- Improve maximum oxygen uptake
- Improve aerobic capacity
- Avoid second wind
- Increase will power
- Improve performance
- Increase lung’s capacity
- Improve capacity for acclimatization

8.5 (c) Effects of exercise on Muscular system

“Muscle is a specialized tissue, which enables the body and its part to move and give shape to the body”
Effects of Exercise

- Change in shape and size of muscle
- Muscle hypertrophy skeletal
- More energy supply to muscle
- Reaction time
- Capillarization
- Reduction in fat
- Muscular endurance
- Posture
- Controls extra fat
- Delays fatigue
- Increase food storage
- Strength and speed

8.6 Physiological changes due to ageing

“Ageing is a gradual and continuous irreversible process that results in structural and functional alteration”

Physiological Changes due to Ageing:-

-Sensory Organs
  a. Hearing
  b. Vision
  c. Taste & smell
  d. Touch & skin

-Urinal system
  a. Bladder
  b. Pelvic muscle weakness-female
  c. Prostate-male
  d. Kidney

-Skeleton system
  a. Bones
  b. Joints

-Digestive system
  a. Dehydration
  b. Infection
  c. Enzymes
8.7 Role of physical activities maintaining functional fitness in aged population

- Reduce the loss of muscle mass
- Helps in maintaining bone density
- Reduce risk of cardio-vascular diseases
- Improve flexibility & strength
- Enhance the lung capacity
- Slowdown the brain ageing
- Improve the mental & social health
- Reduce the risk of age-linked diseases
  A. Diabetes
  B. Obesity
  C. Hypertension
  D. Bad cholesterol
- Improve brain function
Q1. What is flexibility?
Ans. Flexibility is the range of movement of a joint. The range of joints varies significantly from joint to joint & depends on the surrounding tendons, ligaments & muscle tissues.

Q2. What is ageing?
Ans. Ageing is a process of continuous & irreversible decline in the efficiency of various physiological functions.

Q3. What is stroke volume?
Ans. Stroke volume is a volume, which the heart pumps out the blood in a stroke in aorta.

Q4. Define oxygen intake?
Ans. It is the amount of oxygen, which can be taken by the lungs from the atmosphere.

Q5. Define physical fitness?
Ans. Physical fitness is considered a measure of the body's ability to perform effectively & efficiently in work and leisure activities, to be healthy, resist hyperkinetic diseases & emergency situations.

Q6. What is cardiac output?
Ans. The total volume of blood, pumped by heart per minute. Cardiac output = heart rate * stroke volume.

Q7. What is oxygen uptake?
Ans. The amount of oxygen, which can be absorbed and consumed by the working muscle from the blood.

Q8. What do you mean by physiology?
Ans. Physiology is the division of biology that deals with the functions and activities of living organisms & their parts as well as physical and chemical process i.e. Nutrition, movement & reproduction, which is the living activities.
Q9. What is Cardio-vascular system?
Ans. It sends oxygen to various muscles, tissues & arteries and at the same time returns The De-oxygenated blood to the lungs to be re-oxygenated and return the fuel to The Active tissues of the different parts of body.

Cardio vascular system

Re-oxygenated blood & Nutrients

Lungs

De-oxy generated blood

Oxygen & nutrients

Muscles, tissues & arteries

Q10. Define Respiratory system?
Ans. It is a system in which organs to take oxygen inside and throw away carbon dioxide from the body.

Q11. What is Respiration?
Ans. The process of Oxygen supplied to the cells and the transport of carbon dioxide from the cells is called Respiration.

Atmosphere

(Air)

Oxygen

Cells

Carbon dioxide & Water

(Air)

Q12. Define Blood Vessels?
Ans. Blood vessels are, tube like structures in the body, in which, blood flows from heart to cell and vice-versa. Three types of blood cells - arteries, veins & capillaries

Q13. What do you mean by circulatory system?
Ans. The body system, which specialized function of transporting Air, Nutrients, Waste Material, Harmons and Enzymes. It consists Heart, Blood vessels & Glands.
Q14. What is Trachea?
Ans. Trachea is a hollow wind pipe, which permanently kept open and is lined with ciliated epithelium tissues.

Q15. What is the Tidal Volume?
Ans. It is the volume of Air, ventilated with one normal inhalation during ordinary respiration.

Q16. What is Vital Capacity?
Ans. It is the volume of air, that can expelled by the most forcefully expiration after the deepest inspiration.

Q17. What is VO2 Max(Maximum Oxygen uptake)
Ans. It is the maximum amount of Oxygen, utilized by the body in one minute.

Q18. Explain Aerobic capacity?
Ans. It means perform activity with maximum use of oxygen to produce energy for that activity.

Q19. Define Total Lung Volume?
Ans. It is the volume of Air, which, the lungs can accommodate after a deep inspiration.

Q20. Explain Muscle Fibre?
Ans. The Muscle tissues consists of specialized contractile cell. The type of muscle fibre in
The body— 1. Fast Twitch fibres-White fibres.
2. Slow Twitch fibres (Red Fibres)

Q21. What is Myoglobin?
Ans. The Myoglobin is a type protein present in muscle fibre to store oxygen which produces energy in emergencies.
Q22. Define Anaerobic Capacity?
Ans. It means perform activity without the use of oxygen to produce energy for that activity within the body and it’s resultant products are:-

Lactic Acid
Carbon dioxide
Water

SHORT ANSWER TYPE QUESTIONS (80 TO 90 WORDS) - (3 MARKS EACH)

Q1. Differential between Aerobic and Anaerobic Metabolism?
Ans.

Aerobic metabolism
1. Aerobic metabolism means The body can convert nutrients into energy With oxygen and it's waste products Are:-Carbon dioxide and water.
2. Aerobic Metabolism occur in the endurance activities

Anaerobic metabolism
Anaerobic Metabolism means the body Can convert nutrients into energy without oxygen and it’s waste products are:-Lactic Acid, Water and carbon dioxide.

Anaerobic Metabolism occur in speed activities

Q2. What are capillaries?
Ans. Capillaries are the smallest and thinnest vessels in the circulation system. The wall of capillaries, made up of only one layer of cells. The interchange of gases and substance between the blood and the tissues take place here.
Q3. Write the immediate effects of exercise on Cardio-Vascular system?

Ans. 1. **Increase in heart rate:** When and individual starts exercise, his heart rate increases as per the intensity and duration of exercise.

2. **Increase in stroke volume:** Stroke volume increases proportionally with exercise intensity. It is measured in ml/beat.

3. **Increase in cardiac output:** Cardiac output increases proportionally with the intensity of exercise’s t is measured in ltr/minute.

4. **Increase in blood flow:** Cardio-vascular can be distribute more blood to those tissues which have more demand and less blood & those tissues which have less demand for oxygen. The blood is moved away from the main organs such as lever, intestine and kidney in fact it is redirected to the skin to enhance heat loss.

5. **Increase in blood pressure:** During the exercise, systolic blood pressure can increase while diastolic blood pressure usually remains unchanged even during the intensive exercise.
Q4. Differentiate between slow twist fibre and fast twist fibre?

Ans. Slow twist fibre (red fibres)  
The red fibres of muscles are mainly responsible for the endurance activities.  
The red fibres are produced energy by the nutrients in the presence of oxygen only.

Fast twist fibre (white fibres)  
The white fibres of muscle are responsible for strength and speed activities.  
The white fibre are produced energy by the nutrients without the presence of oxygen.

Q5. Write the effects of exercise in muscular system?

Ans. 
1. **Increase in muscle mass:** Through the regular exercise, the cells of the muscle are enlarged, which change the size and shape of the muscle.

2. **Control extra fat:** Regular exercise controls extra fat of the body. Exercise burns the calories, which is taken in the form of fat. This increases the lean mass in the body.

3. **Delays fatigue:** Regular exercise delays fatigue. This fatigue is mainly due to formation of carbon dioxide, lactic acid and acid phosphate. The accumulation of carbon dioxide, acid phosphate, lactic acid become less in a person who performs regular exercise.

4. **Posture:** Regular exercise helps in improving posture by improving portural deformities.

5. **Strength and speed:** Regular exercise improve the strength and speed muscle cells. This is partially due to the hypertrophy of muscles and partially due to increase in the capacity of giving and receiving stimulus

Q6. Describe the effects of exercise on respiratory system?

Ans. The effect of exercise on respiratory system is closely linked with the effect of exercise on circulatory and muscular system. This means That The effect produced on respiratory system by training are improved lung capacity and gas exchange.

1. Improved tidal volume and vital capacity of lungs:
2. Improved aerobic and anaerobic capacity:-
3. Avoid second wind:-
4. Increased will power
5. Unused alveoles become active:- regular exercise activity, the unused alveolus because much amount of oxygen is required in vigorous and prolonged exercise of daily routine. The passive alveoles becomes active.

**LONG ANSWER TYPE QUESTION (150 TO 200 WORDS) - (5 MARKS EACH)**

Q1. Elucidate Physiological changes due to Ageing?

Ans. The Physiological changes, which take place mentioned below.

1. **Change in Nervous System**: During the ageing, reaction time and movement time slows done with increase in age. The brain waits, the size of it's network and it's blood flow decreases with age.

2. **Change in Gastro Intestinal System**: With increase in age, there is a reduction in the production of Hydrochloric Acid, Digestive Enzymes and Saliva. These changes may result in delayed emptying the stomach, impaired swallowing. The breakdown and absorption of food may also be impaired. The liver becomes less efficient in metabolizing drugs and repairing damaged liver cells.

3. **Change in Urinal System**: As we age, the mass of the kidney decreases, which leads to reduction in blood filtration by the kidneys. The capacity of the bladders decreases and there is an increase in residual urine. This increases the chance of urinal infections.

4. **The change in senses**: With advance in age, the senses such as vision, hearing, taste, smell and touch may become less active. Vision and hearing are the most affected by ageing. The taste buds are reduced with age so they loose interest in food.

5. **Change in Respiratory System**: With the age, pulmonary function is impaired with advancing age. The air ways and lung
tissues become less elastic and less efficient. There is decreased Oxygen uptake and Oxygen exchange.

6. **Change in fitness:** The elasticity of Tendons, ligaments and Joint capsules decrease with Ageing. The range of the movement is restricted and muscle mass decreased as the age increases. This leads to decrease Flexibility, Endurance, Strength, Speed with shortness of Breath, Blood Flow, Enzymes etc.

Q2. Explain the effect of Exercise on Circulatory System?

Ans. 1. **Increase in heart size:** Regular exercise develops the muscles of heart. It increases the size of heart along with the strengthening of heart. Heart becomes efficient in doing its job.

2. **Decrease in cholesterol level:** Regular exercise reduces the level of cholesterol in our blood. The level of cholesterol in our blood is directly linked with blood pressure. Exercise decreases the level of low density protein and increases the level of high density lipoprotein. It means that exercise decreases the LDL (bad cholesterol) and increases HDL (good cholesterol).

3. **Faster adaptation to workload:** Due to the regular exercise, the heart can adapt to working load quickly i.e. Quick adjustment of heart according to body needs.

4. **Increase in No. and efficiency of capillaries:** With the regular exercise, efficiency and No of capillaries are increased with the increase of Muscle Mass. The unused and new capillaries become efficient and nutrition the various cells effectively.

5. **Improve the working capacity of cardio-vascular system:** Regular exercise improves cardio-vascular system thus the blood travels faster through the blood vessels and increased circulation of blood makes healing faster.

Q3. Discuss the physiological factors determine the flexibility?

Ans. 1. **Muscle strength:** The muscle should have minimum level of strength to make the movement, specially against the gravity or external force.

2. **Joint structure:** There are different types of joint in human body, some of the joints intrinsically have greater range of motion than
others for example-The ball & socket Joint of the shoulder has the greatest range of motion in comparison to the knee joint.

3. **Internal environment**: Internal environment of athlete influences the flexibility. For example-warm bath increases body temperature and flexibility whereas 10 minutes outside stay in 10°C temperature reduces the body temperature and flexibility.

4. **Injury**: Injuries to connecting tissues and muscles can lead to thickening or fibrocin on the effected area. Fibrous tissues are less elastic and can lead to limb shortening and lead to reduce flexibility.

5. **Age and gender**: Flexibility decreases with the advancement of age. However it is trainable. It can be enhanced with the help of training as strength and endurance are enhanced. Gender also determine the flexibility. Females tend to be more flexible than male .

6. **Active and sedentary life style**: Regular activities enhance the flexibility, whereas Inactive individual looses flexibility due to the soft tissues and joints shrinking and loosing extensibility.

7. **Heredity**: Bony structures of joints and structure length and flexibilities of the joint capsules and surrounding legaments are genetical and can not be altered by stretching programs.

Q4. Elaborate the Role of Regular Exercise on Ageing Process?

Ans. Reduces the risk of Age Related Dieses: Regular exercise reduces the risk of a number of health problems, many aged persons face. Such Health problems are:-

1. **Diabetes, obesity, hypertension and heart disease**: Regular exercise decreases the sugar level, decrease bad cholesterol, increase good cholesterol, decreases blood pressure and blood vessels stiffness.

2. **Increase in muscular strength**: Ageing process does not hinder the individual ability to enhance the muscle strength. Regular exercise increases the strength of the muscles. As a matter of fact, exercise increases the size of muscle which ultimately increases muscular strength.
3. **Reduce the loss of muscle mass:** Muscle mass decreases with advancing age. Ageing has a negative effect on metabolism. Regular exercise reduces the loss of lean body mass and drop in the metabolic rate. Regular exercise also reduces the accumulation of fats.

4. **Enhances the capacity of lungs and hearts:** Regular exercise enhances the working capacity of lungs and heart, it reduces the loss of electricity of muscle fibers of lungs and heart. It also plays a key role in keeping the lungs strong and increase oxygen update and oxygen exchange.

5. **Maintaining the bone density:** The bone density decreases with age. It usually leads to fracture and ostroporosis. Physical exercise helps to maintain bone mass and stimulate bone growth. The ageing persons can increase their bone density with the help of regular exercise.

6. **Slow down the brain due to ageing:** The regular exercise reduces the risk of mild cognitive new nerve cells and builds new capillaries to supply the brain with more oxygen.

7. **Improve mental Health and mood:** Regular physical activities can help to keep thinking learning and judgement skills sharpen. Aerobic and muscle strengthening activities can also reduce the risk of depression and may help to sleep better.

Q5. Discuss the physiological factors, determine the strength as a component of physical Fitness?

Ans. 1. **Muscle size:** Muscle strength directly depends on the cross-sectional area of muscle. It is well known that bigger and larger muscle can produce more force. The force produced by the same size of muscles in males and females is approximately the same but males are found to be stronger because they have larger and bigger muscles in comparison to females.

2. **Body weight:** There is a positive correlation between the body weight and strength. Individuals with the heavier body weight are stronger than the individual with the lighter weight.

3. **Muscle composition:** The muscle composition is genetically determined and can not be changed by any type of training.
4. **Nerve impulses**:- The nervous system also play a role in muscle strength. The brain and nervous system has power to activate more motor units when they need to generate larger amount of force. Through the strength training, the body learns to recruit more motor units and increase these units.

5. **Age and gender**:- Age and gender is a factor which effects the muscle strength. Muscle strength decline with the age but it is primarily due to a decrease in muscle cross-sectional area and decline in the amount of contractil tissues within the muscle fibres. Regular strength training limits loss of muscle strength with ageing. Men has greater absolute muscle strength than women.

Q6. Describe the physiological factors which determine the speed as a component of physical fitness?

Ans. Speed is determined to a great extent by the genetic factors. The study of physiological Factors help to select the activity for an individual.

1. **Mobility of the nervous system**:- The rapid contraction and relaxation of muscles is made possible by the rapid excitation and inhibition of the concerned motor centres. Nervous system can maintain this rapid excitation and inhibition for only for a few seconds. After which the excitation spread to the neighbouring centres causing tension in the entire body. This results in decrease in speed. The mobility of the nervous can be trained only to a very limited extent.

2. **Muscle composition**:- The muscle, which has more percentage of fast twist fibers, contract with more speed in comparison to the muscle which have lower percentage be slow twist fibres. The muscle position is genetical and can not be changed by training.

3. **Explosive Strength**:- For very quick and explosive movements, explosive strength is indispensible. It depends upon metabolic composition, muscle size & muscle coordination. The explosive strength of the muscles can be improved through training.

Q7. Explain the physiological factors determine endurance as a component of physical fitness?

Ans. Endurance is very significant component of physical fitness, which is determined by the following physiological factors.
1. **Aerobic capacity**: To perform an activity continuously, energy is required by the muscles which can be supplied by the presence of energy. Therefore the ability of organism to maintain the adequate supply of oxygen to the working muscles for energy liberation is important for endurance performance. The aerobic capacity depends upon:

   a. **Oxygen intake**: The oxygen intake depends on the vital capacity which further depends on lungs size, no of active alveoli, respiratory muscle and the size of the chest cavity.

   b. **Oxygen transport**: The oxygen transport depends on the amount of oxygen, which the blood has absorbed from the lungs and the ability of the circulatory system to carry this quickly to the working muscles. The amount of oxygen absorbed into the blood depends on the speed of blood flow through the lungs and on the blood haemoglobin. The concentration of blood haemoglobin can be enhanced by training. The transportation of oxygenated blood depends on the capacity of the heart. This capacity can be improved by training.

   c. **Oxygen uptake**: This depends on the rate of defusion, which determined the speed of blood flow, temperature & partial pressure of oxygen in the blood and of carbon dioxide in the muscles. The speed and amount of oxygen consumption depends on the no, size & metabolic capacity of mitochondria and fortunatly can be improved to some extent through training.

   d. **Energy reserves**: The aerobic capacity depends on the muscle glycozen & sugar level in the blood. This can be enhanced by the training

2. **Lactic acid tolerance**: The lactic acid tolerance capacity can be improved through the training.
UNIT - 9

SPORTS MEDICINE

Key Points:
- Concept & definition
- Aims & Scope of Sports Medicine
- Impact of Surfaces & Environment on Athletes
- Sports Injuries: Classifications, Causes & Preventive Measures
- Management of Injuries

Soft Tissue Injuries
(Abrasion, Contusion, Laceration, Incision, Sprain & Strain)

Bone & Joint Injuries
(Dislocation, Fracture, Stress fracture, Green Stick, Communated, Transverse & Oblique & Impacted)

9.1 Concept of Sports Medicine
- Bio-mechanics related to sports
- Effect of attitude on endurance performance
- Psychological aspect performance
- Nutrition & metabolism in relation to competition & performance
- Recommendations of FISM (the International Federation of Sports Medicine at world level)
- Cardio-respiratory function in relation to performance
- Exercise in Cardio-Vascular disease prevention & rehabilitation

**Definition of Sports Medicine:**

“Sports Medicine includes all games & sports & Physical activities, which contribute to the health & welfare of mankind. Sports medicine also includes all kinds of muscles activities & studies related to sports”

**9.2 (a) Aims of Sports medicine:**

A. To aware the sports person & athlete about the different kinds of injury in respect of different games.

B. To concentrate on the causes of injury
   - Lack of Warming up
   - Lack of Techniques/Skills
   - Environment
   - Psychological factors
   - Physical fitness components

C. To provide adequate medical help -Different methods & equipments of treatment -Rehabilitation centres
   1. Infra-red rays
   2. Physiotherapy
   3. thermal treatment
   4. Electro therapy

D. To knowledge of kinds of injury & their necessary precaution i.e. Protective Measures

**9.2 (b) Scope areas of Sports Medicine:**

- Athlete nutrition
- Prevention of accidents in sports
- New methods of detecting doping
- Methods of prediction of sports talent
- Sports & society
- Scientific promotion of sports & games
- Equipments & facilities
- Playgrounds
- Psychological aspects
- Specific fitness
- Human anatomy & physiology
- Sports & first aid
- Sports injury rehabilitation
- Female & sports
- Sports & hematology
- Study of optional load for different ages
- Swimming pool
- Research

9.3 Impact of Surfaces and Environment on Athletes

<table>
<thead>
<tr>
<th>Surfaces</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid/Hard</td>
<td>Environment</td>
</tr>
<tr>
<td>Wooden</td>
<td>Climate</td>
</tr>
<tr>
<td>Concrete</td>
<td>Official's expressions &amp; behavior</td>
</tr>
<tr>
<td>Synthetic</td>
<td>Sports &amp; safety measures</td>
</tr>
<tr>
<td>Soft</td>
<td>Athlete's behavior</td>
</tr>
<tr>
<td>Natural Grass</td>
<td></td>
</tr>
<tr>
<td>Soil</td>
<td></td>
</tr>
<tr>
<td>Synthetic grass</td>
<td></td>
</tr>
</tbody>
</table>

[Class XII : Physical Education] 140
9.4A. Sports Injury

Common Sports Injuries

Soft Tissues Injury
- Contusion
- Strain
- Sprain
- Abrasion
- Incision

Bone Injuries
- Green Stick
- Transverse
- Oblique
- Communated
- Impacted

Joint Injuries
- Shoulder
- Radio humeral
- Injuries-ligament
- Fingers
- Knee Caps

Subluxation (Partial Displaced)
Luxation (Completely Displaced)

B. Causes of sports injury:-

<table>
<thead>
<tr>
<th>Intrinsic Risk Factor</th>
<th>Extrinsic Risk Factors</th>
<th>Environmental Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Physical preparation</td>
<td>- Coaching</td>
<td>a. Climate</td>
</tr>
<tr>
<td>- Lack of proper training-fitness label</td>
<td>a. Poor techniques</td>
<td>b. Playing surfaces</td>
</tr>
<tr>
<td>- Improper warming up &amp; cooling down</td>
<td>b. Lack of knowledge</td>
<td>c. Preventive measures</td>
</tr>
<tr>
<td>- Over use of muscles</td>
<td>- Skill</td>
<td>d. Medical facilities</td>
</tr>
<tr>
<td>- Muscles imbalance</td>
<td>- Rules &amp; regulations</td>
<td></td>
</tr>
<tr>
<td>- Individual variables:-</td>
<td>- Surrounding</td>
<td></td>
</tr>
<tr>
<td>a. Gender &amp; age</td>
<td>- Environment</td>
<td></td>
</tr>
<tr>
<td>b. Nutrition</td>
<td>- Equipment</td>
<td></td>
</tr>
<tr>
<td>c. Fatigue</td>
<td>- Facilities</td>
<td></td>
</tr>
<tr>
<td>d. Posture deformities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Prevention of Sports Injuries

- Pre-participation of medical check up
- Proper conditioning
- Avoid De-hydration
- Protective Sports equipments & Gears
- adequate & effectively maintained facilities
- Sports person’s psychological conditions & environment
- adequate rehabilitation/Injury management
- Proper use of right techniques
- Balanced diet & adequate rest
- Use of proper skills
- Warming up & cooling down

9.5 Management of injuries:-

- First aids:-treatment or assistance given to any injured person before the formal treatment is conducted.
  
  F:-first step-observation of injured athlete
  I:-impression
  R:-rest & relaxation
  S:-support-physical & psychological (support of patient)
  T:-tie-no movement of injured part
  Aid:-assistance in distress-accident investigation division

(A) Soft tissue injuries

- PRICE TREATMENT
  
  - P-Protect the wound
  - R-Rest-No more movement
- I-Ice - To stop the bleeding
- C-Compression - To stop bleeding
- E-Elevation - Heart level

(B) Bone injuries
ICE
I-ICE
C-Compression
E-Elevation

Joint injuries
REST
R-Rest
E-Elevate
S-Support
T-Tight

9.6 Rehabilitation:-
- Normal movement
  * Treatment
  * Physiotherapy
  * Massage
- Training & practice
  * Strength
  * Endurance
  * Flexibility
  * Speed
  * Coordination & agility

**VERY SHORT ANSWER TYPE QUESTION - (1 MARK EACH)**

Q.1 What is sports medicine?

Ans. Sports medicine is a branch of medicine that deals with physical fitness, treatment and prevention of injuries related to sports and exercise.
Q.2 What is sports injury?
Ans. “Sports injuries” are the type of injuries that occur during participating in
sports/competition, training sessions or sports activities.

Q.3 How to classify sports injury?

Q.4 What is soft tissue injury?
Ans. A soft tissue injury is the damage of muscles, ligaments and tendons
throughout the body.

Q.5 Write types of soft tissue injury.
Ans. Types of soft tissue injuries include:
- Bruises (haematoma)
- Sprains (ligaments)
- Strains (tendons)
- Lacerations (skin)
- Dislocations (joints)
- Tendonitis (tendons)

Q.6 What is R.I.C.E.R.?
Ans. The most effective, initial treatment for soft tissue injuries is the R.I.C.E.R.
(R) rest, (I) ice, (C) compression, (E) elevation and obtaining a (R) referral
for appropriate medical treatment.

Q.7 Define sprain?
Ans. Sprain is a sudden stretching of ligaments of a joints & associated with
the pain & de-coloration into tissues. For example:- ankle, elbow, knee

Q.8 What is abrasion?
Ans. Abrasions is injury of skin or mucous membrane due to scrapping or
rubbing. This injury to caused to fell on a hard rough surface.
Q.9 What is laceration?
Ans. Laceration is a more severe injuries of tearing or ripping of the layers of skin and the fatty tissues and muscles below the wound.

Q.10 Define dislocation?
Ans. A dislocation is an injury to a joint — a place where two or more of your bones come together — in which the ends of your bones are forced from their normal positions.

Q.11 What do you mean by fracture?
Ans. A fracture is a broken bone. It can range from a thin crack to a complete break. Fracture caused by a direct blow to the bone either in a fall or a kick.

Q.12 What is FISM?
Ans. The International Federation of Sports Medicine.

**SHORT ANSWER TYPE QUESTION (80 TO 90 WORDS) - (3 MARKS EACH)**

Q.1 What is the concept of sports medicine?
Ans. The modern concept of sports medicine are:-

1. The psychological aspect of performance
2. Exercise in cardio-vascular disease prevention & rehabilitation.
3. Bio-mechanics related to sports
6. Effect of altitude on endurance performance
7. Recommendations of FISM at world level.

Q.2 What are the Aims of sports medicine?

Ans. The Aims of sports medicine are:

1. To prevent to damage to the human system caused mostly by inactivity due to sedentary habits and lack of physical exercise.
2. To concentrate on the causes of injury
3. To recover from the injury and regain maximum body functioning after an accident.
4. Advance preparation to protect athlete from physical injury occurred during play, practice or competition in a match.

Q.3 What are the most common causes of fracture?

Ans. 1. High impact sports injuries
2. Traumatic, forceful and unnatural movements
3. Overuse - prolonged long-distance walking or running
4. Falls
5. Accidents
6. Osteoporosis

Q.4 What are the differences between intrinsic and extrinsic factors of Injury?

Ans.

<table>
<thead>
<tr>
<th>Intrinsic Factors of Injury</th>
<th>Extrinsic Factors of Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors present in the athlete's body like-lack of physical and physiological parameter</td>
<td>Factors present surrounding the athletes. like-climate, playing surface, equipment and facilities</td>
</tr>
</tbody>
</table>
### Intrinsic Factors of Injury
- This factor may be heredity
- This factor may be prevented by the proper training and conditioning of body

### Extrinsic Factors of Injury
- This factor may be natural or man made
- This factor may be prevented by providing good environment & preventive measures

**Long Answer Type Question (150 to 200 Words) - (5 Marks Each)**

Q.1 Write down types of bone fracture?

**Ans.**

- Simple - the bone is broken in one place
- Closed - the skin over the broken bone has not been pierced
- Comminuated - the broken bone has three or more bone fragments
- Greenstick
- Spiral
- Comminuted
- Transverse
- Compound
- Compression

- Open or compound - the skin over the fracture has been pierced and the broken bone is exposed
- Undisplaced - the broken bone pieces are aligned
Displaced - the broken bone pieces are not aligned

Transverse fracture - the fracture is at a right angle to the long axis of the bone

Greenstick fracture - the fracture is on one side of the bone, causing a bend on the other side of the bone

Q.2. How you can avoid sports injuries?

Ans. 1. Proper coaching
2. Proper use of equipment
3. Proper conditioning
4. Proper warming up and cooling down
5. Protective sports equipment and gear
6. Avoid dehydration
7. Balanced diet
8. Use of right techniques
9. Proper knowledge of sports skills
10. Avoid overdoing training
11. Avoid working when muscle is weak because of fatigue
12. Appropriate sports environment
13. Injury management

Q.3 What are the types of injury and its possible causes?

Ans.

<table>
<thead>
<tr>
<th>Type of injury</th>
<th>Structure</th>
<th>Possible cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft tissue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprain</td>
<td>Ligament</td>
<td>Excessive movement forcing the joint past its maximum range of motion, or external violence such as a side push on the knee during a football tackle</td>
</tr>
<tr>
<td>Strain</td>
<td>Muscle or tendon</td>
<td>Overstretching of muscle or tendon generally during sudden acceleration or deceleration</td>
</tr>
<tr>
<td>Type of injury</td>
<td>Structure</td>
<td>Possible cause</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>--------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Contusion (bruise or haematoma) or a cork</td>
<td>Muscle, tendon,</td>
<td>Direct blow from a collision with a player or piece of equipment, or from a heavy fall</td>
</tr>
<tr>
<td></td>
<td>skin</td>
<td></td>
</tr>
<tr>
<td>Open wound - cut, abrasion, laceration</td>
<td>Skin</td>
<td>Direct blow from a collision with a player or piece of equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard tissue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fracture</td>
<td>Bone</td>
<td>Direct trauma such as a blow: Indirect trauma such as falling on an outstretched hand</td>
</tr>
<tr>
<td>Dislocation/subluxation</td>
<td>Joint</td>
<td>Excessive movement of the joint</td>
</tr>
</tbody>
</table>

Q.4 What are the symptoms and treatment of dislocation? What are the preventive measures for dislocation?

Ans. Signs and symptoms of dislocation:

* Discoloured
* Swollen
* Mis-happen
* Limited in mobility
* Intensely Painful
* Incapable of bearing weight

FIRST AID of dislocation:-

* Call 1099 or your local emergency assistance number.
* Splint the joint in its current position to give support. Attempting to reposition the joint could cause additional damage.

ICE & REST

* Ease swelling with ice.
* Rinse the wound gently if the skin is cut.
* Elevate the injured part of body
* Rest & relax the patient
* Elevate the injured part
* Support the injured part with supporting material
* Tie and cover the injured part

**Preventive measures for dislocation**

1. **Awareness:** Players should be well rested and alert. The ability to recognize and avoid hazards on the field, whether from an opponent or a stationary obstacle, is critical.

2. **Equipment:** Gear should fit properly. Shoes should be comfortable and supportive. Helmets should never block vision. Uniforms should fit well and not restrict movement.

3. **Protective gear:** Pads and helmets are a must. Protective gear buffers the force of any impact.

4. Proper warming up and cooling down:-

5. Avoid Irregular surfaces

**Rehabilitation** - Refer to qualified doctors for treatment.

- Normal Movement
  1. Treatment
  2. Physiotherapy
  3. Massage
     - Fitness for Sports participations
     - Measurement of Injured parts fitness component.

Q5. Explain the meaning & need of Sports Medicine in detail.

**Ans.** Sports medicine is a branch of medicine that deals with physical fitness, treatment and prevention of injuries related to sports and exercise.

Sports medicine is the area which creates a positive environment, so an athlete converts his all genetic potentialities into phenotypic realities.
Need of sports medicine:-

- Identification of proper sports talent with the help of medical tests
- Selection and rejection of team members on the basis of sports medical problems
- Helping in the preparation of training schedule
- Prescribing the balance and special diet for people and sports men
- Suggesting coaches and trainers for modifying their training programme
- Educating the athlete regarding first aid of some common sports medical problems
- Educating the athlete regarding use and abuse of drugs and other medicines

Q6. Give description of intrinsic & extrinsic factors in sports injury?

Ans. **EXTRINSIC RISK FACTOR-**

**Inappropriate coaching**
This is given by a coach who doesn’t have up to date knowledge of the current sporting rules and are not implying these rules in training situations.

**Incorrect technique**
This is where the participant slips from the correct technique taught by their coach. Bad technique can then adapt into bad habits leading to injuries.

**Environmental conditions**
These create a risk if the sports hall is slippery or it is raining outside stopping the participant in doing attacking or defensive work making them more likely to slip and cause injury.

**Other sports players**
Getting injured in a contact game from tackles, e.g rugby, in non contact sport getting injured from accidental collision or foul tackles.
Equipment and clothing

This could cause someone to get injured, and there is these to help certain sports. In football they have shin pads

INTRINSIC RISK FACTOR

Inadequate warm up

This prepares the body mentally and physically before a game. It also gets the blood moving around the body.

Poor preparation

This is due to the ability of the sport, if someone is not very fit they cannot go in and play a 90 minute football match. It is also affected by the weather conditions, for example a marathon runner in England and Africa.

Postural defects

Most people are born with this and can affect their running technique by putting more strain on a part of the body compared to the other.

Poor technique

If an athlete has been taught not using the correct method then they can allow injury due to muscles and bones moving in the wrong direction.

Risk factor - age

This varies the type of injury to the level of competition. On one end of the scale one they can fall over lots whereas the other end the injury tends to be more overused.
UNIT 10

BIOMECHANICS & SPORTS

Key Points :

- Projectile & factors affecting projectile trajectory
- Angular & Linear movement
- Introduction to Work, Power & Energy
- Friction
- Mechanical Analysis-Walking & Running
  a. The differentiate between walking & running

10.1 Biomechanics

- “Biomechanics is the science concerned with the internal & external forces acting on a human body & effects produced by these forces”.

- Applications of Biomechanics in sports:-
  *Sports performance
  *Injury preventions
  *Rehabilitations
  *Sports mastery

- Scope of Biomechanics in sports:-
  *Designing of techniques
  *Designing of equipments & facilities
BIOMECHANICS & SPORTS

Power
\( P = F \times V \)
\( P = \frac{F \times S}{T} \)

(Biomechanics) \rightarrow Energy

Potential Energy
\( PE = Mgh \)

Kinetic Energy
\( KE = \frac{1}{2}mv^2 \)

Scope & Importance

Projectile
Energy
Work \( (W = F \times D) \)
Motion
Friction

10.2A Factors affecting projectile trajectory
- Directions
- Angle
- Height
- Speed/velocity
- Air resistance
- Gravity
- Spin
B. Projectile & factors affecting Projectile Trajectory

- Speed of Release
- Angle of Release (Trajectory of Relax)
- Height of Release

10.3 Motion (Movement)

- Linear Motion
- Angular Motion

- Combination Motion

10.4 Introduction of Work, Power & Energy

10.5 Friction

* Type of Friction
* Coefficient of Friction
* Application of Friction in the field of sport
10.6A. Mechanical Analysis of walking

- Stance phase
  * Heel strike
  * Early flat foot
  * Late flat foot-early heel rise
  * Heel rise
  * Toe off

Swing phase

10.6B. Running

- Stance phase
  * Initial contact/float stage
  * Absorption stage
  * Midstance stage
  * Propulsive stage

10.7 Differentiate-Running and Walking

**VERY SHORT ANSWER TYPE QUESTION (1 MARK EACH)**

Q1. Define trajectory?

Ans. The flight path followed by a projectile is called its trajectory.

Q2. What do you mean by sport biomechanics?

Ans. Sport biomechanics is the study of forces and stresses of human movements & their effects, athletics performance and safety.

Q3. What is power?

Ans. The rate of doing work or using energy is called Power.
Power = \frac{\text{work done}}{\text{time taken to do work}}

Q4. Define Work?

Ans. Work refers to an activity involving a force and the movement in the direction of the force. It can also be defined as the work done by a constant force as the product of force and the distance moved in the direction of the force.

\text{Work Done} = \text{Constant force} \times \text{Distance moved in the direction of the force}

Q5. Explain Gravity?

Ans. Gravity is the force of attraction exerted by the earth towards its centre on a body or an object.

Q6. What is Air-resistance?

Ans. When a projectile moves through the air, it is slowed down by air-resistance.

Q7. Define velocity?

Ans. The distance covered by an object per unit time is called velocity.

SHORT ANSWER TYPE QUESTION (80 TO 90 WORDS) - (3 MARKS EACH)

Q1. What is Energy? Explain about Kinetic & Potential Energy?

Ans. The Energy is the capacity to do work. There are various forms of energy.

\textbf{Kinetic Energy:}- It is defined as energy possessed by a body as a result of motion. It is called as—Kinetic energy = \frac{1}{2} \text{mass} \times \text{velocity}^2 (\frac{1}{2}mv^2)

\textbf{Potential Energy:}- It is energy which is stored up in a body because of its position.

\text{Potential Energy} = \text{mass} \times \text{gravitational force} \times \text{height of the body from ground} (mgh)
Q2. Differentiate between Linear and Angular Motion?

Ans. Motions (Momentum) means a Change of position of a body and consists of the upsetting the equilibrium of a body.

**LINEAR MOTION**
When a body moves in a straight line, from one point to other in the same direction, is called linear motion.

Linear Motion is measure in feet, meters, KM etc.

Lines Motion is of two types:

- **Curvy Liner motion** - It is used when body travels on a curved path.

Rotary motion is the movement which occurs when the axis of the body fixed, causing it to move around that particular point when the force is applied to it.

**ANGULAR MOTION**
When a body rotates it turns about an Axis, this rotation of the body is called angular motion.

Angular motion is of two types:

- **Visible Axis** - It is that type which can see for example - hands of a clock.

- **Invisible** - An imaginary axis is that which can not be seen. The axis is the centre of the gravity of the body. For example-A Ball rotated in the air.
Q3. What is Friction? Discuss various types of Friction.

Ans. Friction is the force that combats relative motion between the two surfaces that come in contact. Friction always acts in the opposite direction of the applied force. Friction can be of following types:

**Static friction**: the opposite force that comes into play when one body tends to move over the surface of another, but the actual motion has not yet started.

**Dynamic friction**: the opposing force that comes into play when one body is actually moving over the surface of another body. Dynamic friction may be of two types.

**Rolling friction**: the opposing force that comes into play when body is actually rolling over the surface of another body. For example, hockey/cricket ball is hit

**Sliding friction**: The opposing force that comes into play when one body is actually sliding over the surface of the other body. For example, ice skating.
Q4. Difference between Running and walking?

Ans.-

<table>
<thead>
<tr>
<th>Running</th>
<th>Walking</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Running is a process, in which both feet are off the ground.</td>
<td>Walking is a process, in which at least one part of body (foot) remains in contact with the ground.</td>
</tr>
<tr>
<td>- There is a double swing phase and the swing phase is longer.</td>
<td>There is longer stance phase whereas swing phase is shorter.</td>
</tr>
<tr>
<td>- The linear and angular velocity of lower limbs is faster</td>
<td>The linear and angular velocity of lower limbs is slower.</td>
</tr>
<tr>
<td>- Running requires greater range of motion</td>
<td>Walking requires lesser range of motion</td>
</tr>
</tbody>
</table>

Q5. Is friction advantageous or disadvantageous in the field of games and sports? Give your comments with examples.

Ans. Friction is usually called necessary evil. It means it is essential in the life and we can not do any work without it.

<table>
<thead>
<tr>
<th>Advantages of friction</th>
<th>Disadvantages of friction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Keeps the object at position:- By friction, the objects can be placed at position and shaped.</td>
<td>a. Wear and tear of object:- Due to friction, there is wear and tear of objects. Lubrication is used to allow the parts to move easier, moreover, prevents wear and tear.</td>
</tr>
<tr>
<td>b. Helps to move:- Frictional forces help to move the object by friction. It helps in running, walking. With friction of feet/ shoes on the surface, helps to speed. Frictional force helps to move the object in the speed. For example:- Spikes are used by the athletes to run fast.</td>
<td>b. Wastage of Energy:- Excess of friction means extra energy, thus energy is being wasted.</td>
</tr>
</tbody>
</table>
Advantages of friction

- c. Hold or grip an object: with the help of friction the ridges of skin of our fingers and our palm enable us to grab and hold objects. For example, in badminton the players use grip to hold it.

- d. Produce heat: The law of conservation of energy states that the amount of energy remain constant. Thus, the energy that is lost due to friction in trying to move an object is really turned into heat energy.

Disadvantages of friction

- c. Slow down the speed: In the roller skating, rolling shoes and smooth surface are used to minimize friction.

- d. Makes movement difficult: Friction can make the job more difficult when one has to move the object. Excess friction can make it difficult to slide a box across the floor, walk through deep snow.

LONG ANSWER TYPE QUESTION (5 MARKS EACH)

Q1. What is Projectile? Explain the factors affecting projectile trajectory?

Ans. **Projectile:** An object thrown into the space either horizontally or an acute angle under the action of gravity is called a projectile. There are forces which act on a projectile-gravitational force and air resistance. Air resistance of an object varies greatly and it depends on the object's particular shape and the atmospheric conditions in which the object is released.

The factors affecting Projectile Trajectory are mentioned below.

- a. **Angle of projection:** An object which is projected at different angles covers different distances. When it is projected or released at angle of 30°, making it a parabolic path and covers lesser distance. When it is projected at 60°, it covers a distance less than 30. When it is released at an angle of 45°, makes a parabolic path and covers maximum distance.
distance. So the distance covered by an object (short-put, hammer, javelin, discus etc. depends on the angle of release of projectile).

b. **Height of release:** The higher the level of release, the greater distance is covered in flight, this is because the higher projectile is released. The longer it will be in the air. The horizontal component will be acting on the projectile for longer.

c. **Speed of release (initial velocity):** The speed or velocity is directly related to the distance covered in flight. The speed of release depends on initial vertical velocity and initial horizontal velocity. Having higher horizontal velocity will increase the length of flight time and therefore the distance covered. This would be an advantage in sports which primarily requires good distance in long jump, sky jump etc.

d. **Gravity:** gravity acts on a body or object to give it mass. The greater the weight of an object, the greater the influence of gravity upon it. Gravity will effect a projectile as well as it will decrease the height, the projectile can obtain. For example:-a cricket ball can be thrown at greater distance in comparison to shotput.

e. **Air Resistance:** When a projectile moves through the air, it is slow down by an air resistance. Air resistance decreases the horizontal component of a projectile. The effect of air resistance is very small but it need to be taken into consideration if you want to increase the horizontal components of a projectile. The factors are related to the amount of air resistance acting on a projectile-mass, surface of the object, surface of the volume ratio.
f. **Spin:** The amount and direction of spin acting on a projectile will directly effect the distance while travel.

The main reason behind this fact is the air pressure acting on the object.

Q2. Discuss the mechanical analysis of walking in details?

Ans. Mechanical analysis of walking can be studied in two fields

**Stance phase:** Stance phase is the time, when the foot is on the ground. It is considered that it consists of maximum percentage of walking cycle. For the part of stance phase, both the feet have a contact with the ground for a period of time. The stance phase of walking is divided into five stages.

- **Heel Strike** - This stage begins when the feet first touches the ground and continuous until the complete foot is on the ground i.e. early flat foot stage.

- **Early Flat Foot** - The starting of this stage is that movement when the complete foot is on the ground and early flat foot stage occurs when the body's centre of gravity passes over the top of the foot. The centre of gravity of the body is located approx. In the pelvic area of the lower spine while walking. The main purpose of this stage is to allow the foot to act as a shock absorber.

- **Late Flat Foot** - An athlete comes into late flat foot stage when his body's centre of gravity passes in front of 'neutral position. This stage lasts when the heel lifts off the ground. During this stage the foot needs to go from being a shock absorber to being a rigid lever which can help to propel the body in forward direction.

- **Heel Rise** - This stage starts when the heel begins to leave the ground. The foot functions are a rigid lever to move the body in forward direction. During this stage of walking, the ground forces that go through the foot are very efficient. - Toe off-this stage begins when the toes leave the ground completely. This stage continues until the beginning of swing phase.

**Swing Phase:** It occurs when one foot is on the ground and other one is in the air. Swing phase in walking is shorter than The stance phase. It is divided into three phases.
**Initial swings**: This phase sees the hip extended to 10° and then going onto flexion and knee flexed to 40-60° and the Ankle changing it's position from the flexion to neutral.

**Mid swing**: This phase sees the hip extended to 30°, the knee flexion till 60° and extended approx to 30° and ankle become dorsiflexed.

**Terminal Swing**: This phase is the hip flexed till 30° and the knee is locked extension and foot changes its position from Dorsiflexed to neutral.

Q3. What are the different phases of running cycle?

Ans. Running is an essential part of living beings. Running is important in sports also. A good runner will not only be able to defeat it's opponents in running, but would also be able to gain very good takeoff velocity that would help to take a higher or longer jump.

Different phases of running are mentioned below.

<table>
<thead>
<tr>
<th>Running Style/Phases</th>
<th>Sprinting</th>
<th>Fast Running</th>
<th>Jogging</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Contact</strong></td>
<td>This phase sees the front of the foot of the sprinter making contact with the ground. Their heel might or might not touch the ground later depending on their personal running technique.</td>
<td>This phase sees the middle of the foot or the heel of the fast runner make contact with the ground.</td>
<td>This phase sees the full foot or the heel of the jogger make contact with the ground,</td>
</tr>
<tr>
<td><strong>Mid-Stance</strong></td>
<td>This phase is very quick and the sprinter’s foot is usually in the same position as in the phase of initial contact.</td>
<td>This phase is very quick and the fast runner will spend this phase in mid-stance as he pushes through with this foot.</td>
<td>In comparison to sprinters and fast runners who use their feet and ankle to move into the next phase, joggers tend to move their centre of gravity forward to do the same.</td>
</tr>
<tr>
<td><strong>Propulsion</strong></td>
<td>This phase sees the hips of the sprinter extending back ready to propel him forward for take-off. His</td>
<td>The fast runner receives propulsion through the big toe with his hips extended</td>
<td>The jogger will receive propulsion through the big toe. But if the hips of the jogger are not fully</td>
</tr>
<tr>
<td>Running Style/Phases</td>
<td>Sprinting</td>
<td>Fast Running</td>
<td>Jogging</td>
</tr>
<tr>
<td>----------------------</td>
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</tr>
<tr>
<td><strong>Arms</strong></td>
<td>arms simultaneously swing at full power to help him.</td>
<td>back and knee slightly bent.</td>
<td>extended back, then the propulsion is received from the other toes. The arms of the jogger only move a small amount.</td>
</tr>
<tr>
<td><strong>Swing</strong></td>
<td>The non-supporting leg of the sprinter swings high with the knee at almost at an angle of 90°.</td>
<td>The knee of the non-supporting leg of the fast runner will be lifted, although not as high as that of a sprinter.</td>
<td>The knee of your non-supporting leg of the jogger remains low and only slightly bent.</td>
</tr>
</tbody>
</table>
UNIT 11

PSYCHOLOGY AND SPORTS

Key Points:

- Understanding stress, anxiety and its management.
- Coping strategies.
- Personality, its dimensions and types; Rule of sports in personality.
- Motivation, its type and technique.
- Self-esteem and body image.
- Psychological benefits of exercises.

11.1 The word psychology is derived from a Greek word 'psyche' and 'logos'. 'Psyche' - soul or mind' and 'logos - study'. Generally it is accepted as study of behaviour.

- Psychology is used in sport to enhance performance and to know the factors which affect our performance, like anxiety, stress, personality, motivation, etc.

- Optimum level of anxiety is essential to perform in games and sports.

11.2 Stress is nothing but response of body to an event or situation which are produced by physiological and psychological changes in the body stress is a body's method to react a challenge. It is fight or flight reaction.

- Coping up is a technique which tells us now to handle anxiety or stress.

11.3 Personality is a very important factor in games and sports as it influence the performance of individual by his/her level of cognition, motivation, traits and behaviour.

11.4 Motivation energises an individual to behave in particular way for attaining a specific goal.

11.5A What we think about the self, the total evauation of negative or positive about oneself is called self esteem

11.5B Body image

11.6 Psychological benefits of exercise
Mind and It's Concepts
VERY SHORT ANSWER TYPE QUESTIONS
(I MARK EACH)

Q.1 What is stress?

Ans. It is the physiological and psychological changes in the body caused by an event which create the situation of fight or flight, is called stress. Stress disturbs the normal physical or mental health of a person.

Q.2 What do you mean by anxiety?

Ans. Anxiety is an unpleasant feeling related with uneasy fear or worry. Anxiety is a chronic fear that limits our ability to carry out normal function.

Q.3 What do you understand by coping?

Ans. Coping is the way to deal with unfavorable situations in a better manner. It is the conscious efforts to overcome from the unsolved problem or ability to tolerate unfavorable condition.

Q.4 Define Personality.

Ans. The word personality is derived from Latin word ‘persona’ meaning ‘mask’. According to Guildford - “Personality is of an individual’s unique pattern of traits.

Q.5 Define Motivation.

Ans. The word Motivation is derived from a Latin word “movere” meaning “to change, to move”. It means it is the inner urge of an individual to achieve the goal.

Q.6 What do you mean by self-esteem.

Ans. It is a variety of believes of a person about himself/herself about appearance, belief, pride, triumph and behaviour. Self-esteem is now you value or respect yourself as a person.

Q.7 What do you understand by body - Image?

Ans. Body Image means how a person feels and think about his/her own body. One’s body image is the resultant of ones own personal experiences.
Q.8 Write two techniques of motivation.

Ans. Motivation plays an important role in enhancement of sports performance. There are two techniques of motivation

(1) Goal Settings

(2) Positive Self talk

SHORT ANSWER TYPE QUESTION [80 TO 90 WORDS] - (3 MARKS EACH)

Q.1 Discuss about the types of motivation.

Or

Discuss extrinsic & intrinsic motivation in sports.

Ans. There are two types of motivation in sports

(i) Intrinsic or internal or within motivation

(ii) Extrinsic or outer or external motivation

**Intrinsic Motivation** - Intrinsic motivation means, motivation within individuals. It is natural. In this kind of motivation force comes from within oneself. This motivation in sports can be seen as to get social approval, to display superiority, for enjoyment, satisfaction, to show mastery over skills etc. are the examples.

**Extrinsic Motivation** - It is known as external factor or force which compel the sportsperson to do something. It may be positive or negative in nature. Extrinsic motivation plays an important role in games and sports to enhance the performance or in acquisition of new learning. They are as reward, praise, blame, punishment or cash prize in sports.

Q.2 What do you mean by positive and negative body Image?

Or

What are the types of body image?

Ans. Positive body image means now we feel and look about our body in a positive and healthy image. Physical Traits are not important like thin, tall,
robust etc. or how we look from outside. But it is important in positive body image, how we feel about our body and what we can do. We feel confident and comfortable in terms of our body image.

Negative body image is nothing but one's unhealthy and unpleasant feeling about himself/herself. It is related with one's desire to change his/her body image like - shape, weight, size, etc. One doesn't feel confident and comfortable in terms of his/her body image.

Q.3 Discuss about the effect of stress on an individual in brief.

Or

What are the positive and negative aspects of stress in games and sports.

Ans. Stress is an individual's perception of an event. The perceptions of stress differs from individual to individual. Stress can cause headache, allergies, cold, asthma, hypertension, backache, fatigue, diabetes, etc. The intensity of perception of stress may lead to death. It also weakens the immunity power of the body. When we fail to face stressful situation the physical symptoms like, tension in muscle, anxiety, dizziness, fast heart beat, sweating, fear, etc. can occur. The effect of stress are always not negative can be but positive also optimum level of stress may enhance the performance of a sportsman. Sports psychologists suggest that moderate dose of stress is essential for a sports man while performing.

Q.4 Write down any 3 techniques of anxiety management.

Ans. Three techniques of anxiety management are-

(i) Meditation - Meditation is one the most ancient techniques for anxiety management. This technique is mostly used during competition time. We can sit comfortably and relax our body by using relaxing words like - 'our'.

(ii) Stop Negative Thinking - Negative thinking like - 'I can't do', 'opponent is much more stronger', 'everything will go wrong' can affect the performance of a sports person use should always think positive like - 'I can do' or 'we can do better' for anxiety management.
(iii) **Switch over the situation** - When we feel anxiety we should change or switch over from the disturbed state. We should talk with our team mates, should read motivational books, should talk with coach or listen music.

Q.5 What are the types of stress ?

Ans. Stress is body’s response to an event or situation which are produced by physiological and psychological changes in the body stress is of two types-  

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<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Stress</td>
<td>Acute Stress</td>
<td>Chronic stress</td>
</tr>
</tbody>
</table>
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(i) **Acute Stress** - This type of stress can be seen commonly in day to day life. In sports running and doing exercises are considered as an acute stress. Horse riding, riding on a roller-coaster is an example of acute stress. But these stresses are followed by a pleasant feeling. This kind of stress is very important for games and sports.

(ii) **Chronic Stress** - If a stressful situation continues over a long period of time, it is called chronic stress. It is just opposite from acute stress. It affects the performance of a sportsman, like - memory loss, deteriorated reflexes, psychosomatic disorder, physiological unbalance, etc.

Q.6 How can one learn to manage stressful situations through games and sports.

Or

Write any three techniques to manage stress.
Ans.

Management of stress

(i) **Recreational Activities** - Through participation in games and sports or recreational activities use can avoid the stress. Aerobic exercises are very helpful for reducing stress. Through participation in games and sports our body releases some syndromes which helps to reduce stress.

(ii) **Outdoor Activity** - Outdoor activities are like camping trekking rock climbing are the best examples for stress management. These activities are helpful to learn new skills to handle stressful situations of life.

(iii) **Relaxation Technique** - Through participation in games and sports we can relax our body and mind. There are other techniques of relaxation in games and sports like - deep breathing, massage, pranayam, etc.

Q7. What are the factors influencing body image and self-esteem.

Ans. Following are the factors influencing body image and self-esteem-

- Psychological factors
- Physical Traits
- Physiological changes
- Media
- Family/school, peer group
- Society

- Post Experiences

Factor influencing self esteem and body image of child
The body type or physical traits of an individual is the most important factor which influence the body image and self esteem. Most of the teenagers specially girls want to loose weight and be thinner where as the boys want to be tall and have more muscles.

Sometimes family members may criticize about their body image which affects the self-esteem.

Post experiences, like due to natural aging process, we name different feelings about are body and self esteem. Psychological factors like motivation, personality, interest, attitude, emotions, conflicts, learning skills affect the body image.

Through participation in games and sports use can develop our physical fitness, psychological development, social and mental development which helps to improve our body image and self-esteem.

**LONG ANSWER TYPE QUESTION (150 TO 200 WORDS) - (5 MARKS EACH)**

**Q.1 What are the coping strategies used in games & sports?**

Or

Through participation in games & sports one learns to cope up with day to day life. Discuss.

Or

What are problem focused coping strategies and emotion focused coping strategies.

Ans. Through participation in physical education and sports one become capable to come out from various self created problems, Environmental (Surrounding) created problem and various psychological and physiological strain.
There are two types of coping strategies -

1. Problem focused strategies -

   While participating in games & sports, a sports person faces different types of situations with their teammates, coaches, and surrounding. Problem-focused strategies depend upon the level of adjustment of individuals to individual. Its aim is to change or eliminate the source of stress.

2. Emotion focused coping strategies:

   These strategies are directly related with the sportsman's feeling, or negative thoughts linked with stress as anxiety, fear, excitement, frustration, depression. By using these strategies, one becomes capable of tackling the feeling of distress.

Through participation in games and sports, we can develop individual qualities such as physical development, mental development, physical fitness, cultural development, leadership qualities, healthy & safety habits, democratic values, construction of leisure time, creativity, economic values, mental relaxation, national integration, citizen qualities, character development, personal adjustment, which helps to cope up with day to day life.
Q.2 What are the types of personalities and explain one of them with its importance in physical education and sports.

Ans. The word personality is derived from a Latin word 'persona', which means 'mask'. Personality is a byproduct of psychological, sociological and physical traits of an individual. Personality is nothing but cognition, motivation, emotions and behavior of an individual in different situations. There are following types of personalities in games and sports:

Classification of personality

On the basis of temperament
1. Hippocrates type
2. Jung classification

On the basis of physical traits
1. Kretschmer type
2. Sheldon's classification

Endomorphic Meomorphic Extomorphic

1. **Endomorphic** - A person of such personality is flokky, soft fat, happy, outgoing, roly-poly and who are found to fool easy-going, slow in reaction and sociable. It is also called eiscerotonic. In games and sports these type of personality can prove better in strength dominant sports.

2. **Mesomorphic** - A person of such personality having well developed body, assertic, athletic build, bold and risk taking who is adventurous courageous and having a linking with physical activity. It is also called somatotomic. In games and sports these type of personality can prove better in team games, like football, hockey etc.

**Ectomorphic** - A person of such personality having weak and delicate body type. They are reserve, anxious pessimistic, studious, tense, introvert. This also called cerbrotonic.

In games and sports these type of personality can prove better in endurance dominant sports, like athletics.
At last you can say that these types of personalities have great importance in games and sports to chose and perform in different sports activities.

Q.3 How motivation of a sports person affect games and sports and how games and sports can influence one’s motivation.

Or

What is the importance of motivation is games and sports?

Ans. Excellence in sports cannot be achieved overnight. In games and sports an athlete has to face many challenges such as psychological pressure, fatigue, stress-strain, mood disturbances. It is only highly motivated athlete who perform their best at the time of competition. It can be shown in the form of an equation -

\[
\text{Learning + Motivation} = \text{Performance}
\]

Only learning of tactics, techniques, physical training are not adequate to perform in a competition. Study shows that in games sports motivation is a prominent factor which energies and direct the performance motivation help in setting the goal and helps in channelising their energy to achieve these goals. It can be intrinsic or extrinsic kind of motivation like-reward, price, blame cash prize, enjoyment, satisfaction or to show mastery own skill.

It is very important for the coach to know, what will motivate his/her sports person to take part in games and sports in the first step towards effective performance. There are several factors which effect the performance of athlete but its only motivation which gives shape to the performance. Optimum level of motivation is essential for effective performance. But such level of motivation differs from person to person.

For eg- If an athlete is well motivated, but he need a systematic and scientific programme to direct his/her motivation.

At last we can say optimum motivation can effect games and sports and through participation in games influence the motivation of an athlete.

Q.4 What are the dimensions of personality?

Ans. There are four dimensions of personality in games and sports.
Dimensions of personality

Physical dimension

Mental & intellectual dimension

Emotional dimension

Social dimension

Physical dimension - The word physical itself the meaning of body structure or the physique as the primary aspect of humour personality here duty has a very important sole for the development of this aspect of personality. But appropriate environment is also required for development of this dimension physical dimension of personality means how we look, height, weight, etc.

Mental and intellectual dimension - A person is known by his mind and body and connot survive effectively in absence of one part. how we react and response quickly to any situation or event in games and sports, entirely depends upon our mental and intellectual dimension of personality. It help in learning new skills, adjust in new circumstances.

Social dimension - An individual takes part in games and sports to satisfy or gain social value like status power, affection inherent attitude, tendency, interest and capabilities. He has to modify his behaviour to follow the rules, customs and tradition of society.

Emotional dimension - Emotions play a great role in games and sports. Emotions are personal in nature and differ in nature from person to person. Every child responses differently as they have different emotions.

The above dimension of personality helps to select different sports according to their nature, built, temperament etc.

Q.5 How one’s personality can be developed through participation in games & sports

Or

“Games and sports have a major Impact on one’s personality” Discuss.

Ans. Personality is nothing but the way we look, the way we talk, the way we walk, our appearance, the way we adjust, the way we think, the way we handle situations.
Impact of games and sports on personality

- Physical development (muscular, bone, structural)
- Physiological development (heart, lungs, kidney etc.)
- Psychological development (emotional, mental, intellectual)
- Social development (leadership qualities, democratic values, etc.)

Through participation in games and sports or regular exercise we can develop the components of physical fitness like strength, speed, endurance, feasibility and coordinative ability.

Through participation in games and we learn to coordinate the muscular and nervous system, we learn quick and effective movement with athlete heart and efficient respiratory system function all the internal organs become efficient and smoothly.

Through participation in games and sports, we warm the skill, rules, techniques and strategies and how to interpretate them in a new situation effectively. We learn healthy habits which improve mental development. We learn how to handle our emotions in different situations.

Through games and sports we develop the social qualities of an individual like adjustment, cooperation, leadership, respect, national integration, discipline, determination. Hence we can say that games & sports play a vital role in personality development of an individual.

Q.6 What are the techniques of motivation which helps to enhance the performance of an athlete in games & sports.

Ans. In games and sports performance does not depends upon a single factor. The performance of an athlete directly depends upon his/her coach, the environment in which he or she took training, his personal and social dimension, and the most important factor is motivation.

Following are the techniques used in games & sports by an athlete and his/her coach.
Techniques of Motivation

Athelete
- Goal setting
- Showing superiority
- Satisfaction
- Self-Appraisal

External factor
- Reward
- Praise
- Punishment

Coach
- Competition
- Equipment
- Environment
- Scholarships
- Social recognition

In games and sports the technique used by an athelete is of two types - Internal and external. In internal is techniques he/she set their goals, display superiority, show mastery our the skill and satisfaction. He/she is well motivated by reward, praise.

The most important factor in games and sports is coach the whole training and coaching revalues around the coach. Coach must know his/her athelete, athelete's background, their attitude, past experiences and individual differences. He must act as a motivator.

External factors like competition, proper equipment, well maintained environment like grounds, fields, court play an important motivation.
techniques in games & sports. scholarship and social recognition like Arjun award, Dronacharya award etc. are motivation techniques to motivate an athlete at national and international level. The above techniques are very helpful in motivating sportspersons.

Q7. What are the Psychological benefits of exercises?

Or

How a sportsperson becomes psychologically strong through participations in games and sports?

Ans. Psychology is directly related with the behaviour of the sportsperson. Through participation in games and sports or doing exercises benefits the sportsperson in following ways:-

<table>
<thead>
<tr>
<th>Psychological Benefits of exercise/Games &amp; Sports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-competition Benefits</td>
</tr>
<tr>
<td>1. Developing body awareness</td>
</tr>
<tr>
<td>2. Coordination</td>
</tr>
<tr>
<td>3. Body control</td>
</tr>
<tr>
<td>4. Balance sense</td>
</tr>
<tr>
<td>5. Self esteem</td>
</tr>
<tr>
<td>6. Knowing abilities and capabilities</td>
</tr>
<tr>
<td>7. goal setting</td>
</tr>
<tr>
<td>During competition Benefits</td>
</tr>
<tr>
<td>1. Stress and anxiety management</td>
</tr>
<tr>
<td>2. Mental roughness</td>
</tr>
<tr>
<td>3. Positive attitude</td>
</tr>
<tr>
<td>4. Motivation</td>
</tr>
<tr>
<td>Post-competition Benefits</td>
</tr>
<tr>
<td>1. Cope-up with situation</td>
</tr>
<tr>
<td>2. Redirection of goal setting</td>
</tr>
<tr>
<td>3. Helps in return after injury</td>
</tr>
</tbody>
</table>

Mainly we are discussing here the psychological benefits of games & sports. When we start participating in games and sports, we learn body awareness.
Coordination, Body control and balancing sense and it builds our body image, confidence and increases our self-esteem. One gets to know about his/her abilities and capabilities and starts setting his/her goals in games and sports. Through participation in games & sports, one learns to manage stressful situations and anxiety. Doing exercises and preparing for competitions, one becomes mentally tough, gains positive attitude and gets motivated for competition.

After losing or running, a sportsman learns to cope up with different kinds of situations. Through participation in games & sports one learn how to rehabilitate after the injury. These are the psychological benefits of exercises for a sportsman while competing and also help a person lead a healthy and normal life.
UNIT 12

TRAINING IN SPORTS

Key Points:

- **Strength**—Definition, Types and Methods of Improving Strength—Isometric, Isotonic and Isokinetic.
- **Endurance**—Definition, Types and Methods of Develop Endurance—Continuous Training, Interval Training and Fartlek Training.
- **Speed**—Definition, Types and Methods of Develop Speed—Acceleration Run and Pace Run.
- **Flexibility**—Definition, Types and Methods to Improve Flexibility.
- **Coordinative Abilities**—Definition and Types.

12.1 **A.** Sports performance are to be achieved in sports competition.

**B.** When we take part in games and sports we try to perform our best and our performance directly depends upon many factors.

**C.** Basically, the performance of the sportsman depends upon strength, endurance, speed flexibility and coordination abilities.

**D.** Sports training is done for improving these factors and ultimately our performance.

12.2 **When an individual exerts muscular force against resistance in games and sports, it is called his or her strength.**

12.3 **When an individual perform under the condition of fatigue for a long time, it is called his or her endurance.**

12.4 In games and sports, when an individual performs a movements quickly, it is called his or her speed.
12.5 Flexibility is the range of movement of the joints of a sportsperson.

12.6 The ability of an individual to do various related activities smoothly and efficiently is known as coordinative ability.

According to nature of activities
- Basic endurance
- General endurance
- Specific endurance

According to duration of activities
- Speed endurance
- Short-Term endurance
- Medium endurance
- Long-term endurance

Flexibility
- Active
- Passive

Coordinative Abilities
- 1. Balance ability
- 2. Reaction ability
- 3. Adaptation ability
- 4. Rhythmic ability

Factors determining speed
- Reaction time ability
- Movement speed
- Acceleration ability
- Locomotor ability
- Speed endurance

Speed
- Methods to develop speed
- Acceleration run
- Pace run

Strength
- Maximum strength
- Explosive strength
- Strength endurance

SPORTS & IT’S COMPONENTS
Q1. What is speed?
Ans. It is the ability of an individual to cover a unit distance in minimum time.

Q2. What is strength?
Ans. It is the ability of an individual to overcome or act against resistance.

Q3. What is endurance?
Ans. It is the ability of an individual to resists the fatigue for long time.

Q4. What is flexibility?
Ans. It is the ability of an individual to move his or her joints effectively through a full range.

Q5. What is coordinative ability?
Ans. It is the ability of an individual to perform a sequence of movements smoothly and accurately.

Q6. What is speed endurance?
Ans. It is the ability of an individual to perform body movements with high speed under the condition of fatigue upto 45 seconds. Ex. -400 metres race.

Q7. What is strength endurance?
Ans. It is the ability of an individual to exert force for a long period of time.

Q8. What is acceleration?
Ans. It is the ability of an individual to achieve high speed, from a slow moving or stationary position.

Q9. What is explosive strength?
Ans. It is the ability of an individual to overcome resistance with high speed.

Q10. What is reaction ability?
Ans. It is that ability of an individual to react effectively and quickly to a signal. It is of 2 types –
(1) General reaction ability
(2) Complex reaction ability.

Q11. What is movement speed?
Ans. It is the ability of an individual to do movements in minimum time.

**SHORT ANSWER TYPE QUESTION [80 TO 90 WORDS] - (3 MARKS EACH)**

Q1. What do you understand by maximum strength?
Ans. It is the ability to apply maximum force by a group of muscles against maximum resistance. Maximum strength is usually not used in majority of sports, it is used in those sports where heavy weight, resistance have to be tackled, like - weight lifting, throwing, roman ring and take off in jump. If the resistance is less, less strength is needed to overcome it. The maximum strength is a motor ability and involves face application during a voluntary movement. It serves as the base of good explosive strength and strength endurance.

Q2. What is the difference between active and passive flexibility?
Ans. Active flexibility is the ability of an individual to do the joint movement for a longer range without any external help. Active flexibility is always greater than passive flexibility Ex.- Doing any stretching exercise without external help.

Passive - The ability to do a joint movement with a greater range with an external help of a partner. This flexibility is largely determined by joint structure, stretchability of the muscle and ligament. Passive flexibility helps in the development of active flexibility.

Q3. What are coordinative abilities in sports?
Ans. Coordinative abilities are those abilities which are stabilized and generalised pattern of motor control. These abilities help the sportsman to do a group
of movements with better quality and effect. Coordinative abilities primarily depend upon the Central Nervous system. In sports, the coordinative abilities are as under :-

(i) Differentiation ability
(ii) Orientation ability
(iii) Coupling ability
(iv) Reaction ability
(v) Balance ability
(vi) Rhythm ability
(vii) Adaptation ability

Methods for Improvement of coordination abilities :-

(1) Practicing physical exercise
(2) Correct and conscious movement
(3) Additional means to improve motor sense.
(4) Variation in exercises
(5) Degree of difficulty

Q4. Briefly explain the types of Endurance.

Or

“Endurance is one of the most important factor for high performance in games & sports.” Explain.

Ans. Endurance in sports are of different types. These are as follows -
Endurance

According to nature of activity

Basic endurance

According to duration of activity

Speed endurance

Short time endurance

Medium time endurance

Long time endurance

Specific endurance

Basic endurance is the ability of an individual to do the movement in which large no. of body muscles involve at slow pace for a long duration such as walking, jogging, swimming at a moderate speed. General endurance is the ability of an individual to do movement under the condition of fatigue.

Specific endurance is the ability of an individual to complete the task without any fatigue. It's requirement is depends upon the nature of activity (games and sports). Requirement of specific endurance of a boxer is different from that of a wrestler.

Speed endurance is the ability of an individual to perform a movement with high speed under the condition of fatigue upto 45 seconds.

In short terms endurance, the activity lasts from 45 seconds to 2 minutes. Ex. 800m race.

The medium time endurance is needed for 1500m race, lasting from 2 min to 11 minutes.

Long term endurance is needed for those sports which require more than 11 minutes time. Ex. 5000m to 10000m race.
LONG ANSWER TYPE QUESTION [150 TO 200 WORDS] -
(5 MARKS EACH)

Q1. What are the methods for developing strength?

Or

Write the difference between isometric, istonic and isokinetic exercises.

Ans. The word isometric is comprised of 2 words “iso Same” and “metric length”, means when we do these exercises, there is no change in the length of the muscles. In these exercises work done cannot be observed. These exercises require less time and equipment and can be carried out anywhere. These exercises are useful for maintaining strength in case of injury.

Eg : Archery, weight lifting, gymnastic are the examples of isometric movements.

Pushing the wall  Hanging on Pole

Work done = Force × Distance moved

But distance moved is O, therefore work done is zero.

ISOTONIC - EXERCISES :- ‘iso’ means same and ‘tonic’ means tension. In these types of exercise when we do movements it can be observed directly. The lengthening and shorting of muscles can be seen and called eccentric contraction and concentric contraction accordingly. Ex. When we throw a ball, jump, run, weight training, these type of contraction occurs. These type of exercise is widely seen in games & sports. We can do these exercise with equipment or without equipment. These exercise increase the flexibility and length of the muscles and are good for conditioning in sports.
**ISO-KINETIC EXERCISES:** ‘ISO → same’ and ‘kinetic → motion’. These exercises were introduced by J.J. Perrine in 1968. These exercises are done by specially design machine and are combination of isotonic and iso-metric exercises. These exercises develop strength of muscles. These type of movements are usually not applied in games and sports except water sports, skating, climbing, running etc.

Q2. Explain the methods to develop endurance.

Or

Differentiate the continuous method, interval method and farlek method.

**Ans.** Endurance has a great importance in games and sports. Following are the methods to develop endurance.

- **Continuous method** - In this type of method, the exercise is done for a long duration without taking rest. We do the exercise for a long duration, so the intensity of work is low. The heart rate during the exercise for a sportsman should be between 140-160 beats per-minutes. For fast continuous method the heart rate of an athlete should be increased about 175-180/minute.

- **Fartlek method** - It is another method to develop the endurance ability. This method was developed by a Swedish coach “Gosta Holmer” in 1930, so it is also known as “Swedish Play” or “Speed Play” (Fartlek means
speed in Swedish). In this method, the athlete changes his/her pace, himself/herself according to surrounding (hills, rivers, forest, mud etc.)

This method helps in development of strength and endurance of the sports person. Athlete changes his/her speed according. So it is self-disciplined in nature. The heart-rate fluctuates between 140-180 beats/minute. Farllek training involves varying our pace throughout our run, alternating between fast and slow pace.

Fixed distance in fixed time by variable type of movement/pattern/place of running.

**Interval method** - This method is very effective for developing endurance for track runners. Intervals are given to the athlete in between the repetition for incomplete recovery. The recovery period for athlete varies from person to person. The heart rate should go up to 18 beats/min. And when the heart rate comes down to 120-130 beats/min, again the repetition / work starts. The training load should be given again after checking the heart-rate of the athlete.

Activity - Active Rest - Activity - Active Rest - Activity

[Rest = Recovery]

Q3. What are the methods to develop/improve flexibility? Explain

Or

What is the difference between ballistic method and Post - Isometric Method?

Ans. To maintain feasibility in games and sports, stretching exercises should be done. By following methods, one can improve their feasibility.

Flexibility

- Stretch & Held Method
- Ballistic Method
- Post - Isometric Method

(1) **Stretch & hold methods** - We stretch our joints to maximum limit and hold it for a few seconds before returning to the initial
phase. The holding period must be not more than 3 to 8 secs. This method is also used for improving passive flexibility.

(2) **Ballistic method** - In this method the stretching exercises are done in a swing, so this is called the ballistic method. A proper warm-up should be done before these exercises. Due to overstretching of the muscle, there may be an injury. The stretching exercise can be done in a rhythm.

(3) **Post - isometric method** - This method is based on the principle of proprioceptive neuro-muscular facilitation means, if a muscle is contracted maximally for a few seconds, then after the contraction it remains in a static position for a few seconds for 6-7 seconds and gives very low resistance to that stretch. The duration of the stretch should be increased upto 8-10 second and repeated 4-8 times for each muscle group.

Q4. Briefly explain any two methods for improving speed write down the factors determining speed?

**Ans.**

Methods for Improvement of speed

1. Reaction time Ability
2. Movement speed
3. Acceleration ability
4. Locomotor ability
5. Speed endurance

**Two methods for developing speed are** -

(1) **Acceleration Run** - Acceleration run are usually used to develop speed indirectly by improving explosive strength, technique, flexibility and movement frequency. It is the ability of a sprinter to achieve high speed from a stationary position. For direct improvement of acceleration speed a sprinter should do 25-30 metres sprints of 6-12 times. The maximum speed should be achieved within 5-6 seconds. Sufficient intervals should be provided between the repetition.
(2) **Pace run** - Pace run means sunning the whole distance with a constant speed. Generally 800 m and above races are included in pace races. An athlete can run a distance of 300 m at full speed but in longer races such as 800 m or above, he must reserve his energy by reducing the speed.
## TYPOLOGY FOR QUESTION PAPER - PHYSICAL EDUCATION

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>01 Mark-11 Questions: 03 Marks-08 Questions & 05 Marks-07 Questions.


#The details under Columns A, B & N will remain unchanged. However, the weightage given to various units as shown above may not remain the same.

$The question paper shall compulsorily include 01 Value Based Question.
## PHYSICAL FITNESS TEST (048) (GIRLS)

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<th>Standing Broad Jump (In mtrs)</th>
<th>Vertical Jump (In mtrs)</th>
<th>Modified Bent Knee Push-ups (In nos.)</th>
<th>Bent Knee Sit-ups (In nos.)</th>
<th>Overhead/Backward Basketball Throw with both the Hands (In mtrs)</th>
<th>Shot Put 04.00 Kgs (In mtrs)</th>
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* Each student will have to choose five items for test of choice.
* One item for test must be chosen from ‘A’; one from ‘B’; one from ‘C’; one from ‘D’ and test item number ‘E’ is compulsory for all.
## VII. NORMS FOR PHYSICAL FITNESS TEST

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* Each student will have to choose five items for test of choice.
* One item for test must be chosen from ‘A’; one from ‘B’; one from ‘C’; one from ‘D’ and test item number ‘E’ is compulsory for all.
PHYSICAL EDUCATION (THEORY)
2014-15

Time allowed : 3 hours                                      Maximum Marks : 70

General Instruction :

(1) Question Paper consists of 26 questions.

(2) All question are compulsory

(3) The answer to one mark question should be of 20-30 words. Answer to three marks question should be of 80-90 word and five marks question, answer should be of 150-200 words.

1. Suggest any four ways through which women participation in sport across age group can be enhanced.

2. Trekking is a long adventurous journey undertaken on foot in areas where common means of transport are generally not available. Name any four important materials required that should be carried along.

3. Enlist two objectives of Intramurals.

4. Enlist two sources for calcium and Iron separately.

5. Explain correct sitting posture.

6. 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.

7. Your grandmother feels she has reduced her upper body flexibility and therefore she wants to test herself. Which test would you suggest her?

8. Explain the term hypertrophy of muscles.

9. What do you understand by linear movement?

10. Explain the term “Realistic” in goal setting principles.

11. Suggest any two Isometric exercises for shoulder region.
12. What safety measures children should be taught while participating in Trekking?

13. Briefly explain the functions and resources of three fat soluble vitamins.

14. Neeti along with her father was regular at district park in early morning. She realized that most of the children are obese. She along with her few classmates wants to help those children. She discussed with her physical education teacher and the Principal of the school. School decided to organized awareness rally for the neighbourhood.

(i) How obesity can be prevented? Give two ways.

(ii) Give any two disadvantages of obesity.

(iii) What values are shown by Neeti and her classmates?

15. Briefly explain the six physical benefits of exercise to children.


17. Maintaining physical activities for a longer period, brings desirous changes in circulatory system. Justify your answer by highlighting three benefits of exercise.

18. What is the difference between linear and angular motion? Explain through example.

19. What do you understand by relative strength? Explain the importance of body weight in determining relative strength.

20. What role an individual can play in improvement of sport environment?

21. Being sports captain of the school, prepare five important committees with their responsibilities to conduct one day Run for health Race.

22. What are the important functions of our skeletal system?

23. Explain Shendon’s classification of personality and explain its importance in physical education and sport.

24. What is movement speed? Explain the methods to develop speed endurance.
25. Diet for sportspersons are important. What should be the aims of preparing diet for sportsperson?

26. “Involvement in physical activities for longer period of time with intensity can improve the quality of life.” Justify your answer.
Q1. Suggest any four ways through which women participation in sport across age group can be enhanced. 

Ans. (a) Modification in Legislation.
(b) Better coverage of women sports
(c) Improvement in fitness and wellness movements
(d) Educating Women
(e) Increasing women coaches..
(f) Ensuring personal safety of women.
(g) Giving more opportunities for women competition.,

Q2. Trekking is a long adventurous journey undertaken on foot in area where common means of transport are generally not available. Name any four important materials required that should be carried along.

Ans. 1. Food material and cooking utensils
2. Clothing
3. First Aid Box
4. Sleeping Bags
5. Pair Of Shoes And Socks
6. Rope
7. Windcheater In Rainy Season
8. Candle or Flash Light
9. Matchbox
10. Chalk
11. Soap
12. Paper Dishes, Safety Pins
13. Tent
14. Mattress
15. Stove

(Any Four points from The List)

Q.3. **Enlist two objectives of Intramurals.** $\frac{1}{4} + \frac{1}{4} = 1$

Ans. Essential for physical, mental, emotional and social development of students

- Develops moral and ethical values of the students
- Develops health of the children
- Calm down the fighting instinct of the children
- Refresh the child and make them agile.
- Provides maximum recreation
- Provide opportunity to the maximum number of students to participate in sports
- Develops leadership qualities among the children

Q.4 **Enlist two sources for calcium and iron separately.** $\frac{1}{4} \times 4 = 1$

Ans. Calcium sources: Cheese, Milk, Orange Juice, Eggs, Yogurt, grams, Leafy Vegetable and cereals. Iron sources: liver, meat, orange juice, egg, dry fruits, spinach, banana and green leafy vegetables

Q.5 **Explain correct sitting posture.** 1

Ans. When we sit in a chair, our hips should be as far as back in the chair as possible. Head, spinal column, Shoulder and hips should be in straight line and erect. Legs should touch the ground and not in hanged position.
Thighs should be in horizontal position. While we read, the book should be on the table but the book should not be too away or near the eyes. The approximate distance between book and eyes should be atleast 30 cms. If we do not follow this rule, then eyesight problem may occur.

Q.6 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 heats for 1 to 1.5 minutes.

Ans. The athlete’s fitness index score is calculated with the help of following formula.

Fitness index score = \((100 \times \text{test duration in seconds}) \div (2 \times \text{sum of heart beats in recovery period}).\)

\(\frac{(100 \times 180 \text{ Sec})}{2 \times 54} = \frac{500}{3} = 166.66\)

Q7. Your grandmother feels she has reduced her upper body flexibility and therefore she wants to test herself, which test would you suggest her?

Ans. Back scratch test for upper body flexibility.

Q8. Explain the term Hypertrophy of muscles.

Ans. Increase in size of the muscle fiber due to regular exercises or Hypertrophy is enlargement of heart due to regular exercises which is called “Athletic heart”

Q9. What do you understand by linear movement?

Ans. Linear movement refers to any movement along a straight line in one direction.

Q10. Explain the term “realistic” in goal setting principles.

And. Realistic goals are achievable goals.

Q11. Suggest any two isometric exercises for shoulders region.

\(\frac{1}{4} + \frac{1}{4} = 1\)

Ans: 1. Pushing against the wall
2. Holding pushup position
3. Standing straight with holding barbells/dumbbell
Q12. What safety measures children should be taught while participating in trekking?

Ans.  1. Avoid trekking during bad weather conditions
      2. To prevent insect bite do wear full sleeves shirts and full pants
      3. Wear proper footwear so that you don’t slip while trekking
      4. Don’t eat leaves, flowers etc. while trekking, they may be poisonous.

Any other relevant answer

(If only points are mentioned give \(1/4\) marks for each point)

Q13. Briefly explain the function and resources of three fat soluble vitamins.

Ans. Fat soluble vitamins are A,D,E,K.

Functions: Vitamins increase immunity power in our body against disease and also give their important contribution for general development of body.

Sources of Vitamin A: ghee, milk, curd, egg yolk, fish, tomato, papaya, green vegetables, orange, spinach, carrot, pumpkin etc.

Sources of Vitamin D: egg yolk, fish, sunlight. Vegetables, cod liver oil, milk, cream, butter, tomato, carrot etc.

Sources of Vitamin E: green vegetables, kidney, liver, heart cotton seed, sprouts seeds, coconut oil, yolk, dry and fresh fruits, milk, meat, butter and maize.

Sources of Vitamin K: cauliflower, spinach, cabbage, tomatoes, potato, green vegetables, wheat, egg and meat etc.

(Any three to be written, If only points are mentioned give \(1/4\) marks for each point)

Q14. Neeti along with her father was regular at district park in early morning. She realized that most of the children are obese. She along with her few classmates wanted to help those children. She discussed with her physical education teacher and the principal of the school. School decided to organize awareness rally for the neighborhood.
(i) **How obesity can be prevented? Give two ways.**

(ii) **Give any two disadvantages of obesity.**

(iii) **What values are shown by Neeti and her classmates?**

(iv) **Obesity can be prevented by:**

\[
\frac{1}{4} \times 6 = 3
\]

**Ans.**

1. Active life style
2. Avoid fatty food and over eating
3. Avoid fast and junk food
4. Don't eat frequently
5. Avoid rich carbohydrates
6. Avoid alcohol, smoking and drugs
7. Regular exercise/ physical activity
8. Lay stress on health not on weight (Any two)

(ii) **Disadvantages of obesity:**

1. Less flexibility
2. More chances of injury
3. More disease/ physical health problems
4. Emotionally weak
5. Bad posture
6. Decreased growth and development **(any two)**

(iii) **Values shown:**

1. Good moral character
2. Self- discipline
3. Loyal
4. Energetic
5. Friendliness and affection
6. Decisiveness
7. Respect for other people
8. Social.
9. Logical and decision maker
10. Morality and loyalty (ANY TWO)

*(If only points are mentioned give $\frac{1}{4}$ marks for each point)*

**Q15. Briefly explain the six physical benefits of exercise to children. 3**

**Ans.**
1. Control weight
2. Strengthen bones
3. Strengthen heart
4. Boost energy level
5. Prevent joint problem
6. Reduces the chances of chronic diseases

*(Or Point)*

*(If only points are mentioned give $\frac{1}{4}$ marks for each point)*

**Q16. Explain the procedure for conducting Kraus-Weber test for measuring minimum muscular strength. 3**

**Ans.** Kraus-Weber Test. This test consists of six items. It is commonly known as the Kraus-Weber Tests. These tests are supposed to measure the minimum muscular fitness of an individual. Infact, they measure a level of strength and flexibility of certain key muscle groups below which the functioning of whole body as a healthy individual seems to be endangered. These tests are graded on a pass-fail basis. But partial movements on each test can be scored from 0 to 10. Six tests measures minimum muscular fitness of an individual.

**Test No. 1.** The subject lies down in supine position i.e., flat on his back and hands behind his neck. The examiner holds his feet to keep him on
the ground. The subject is asked to perform on sit-up. If he performs one sit-up, he passes this test. If he cannot raise his shoulders from the table or ground, his score remains zero.

**Test No. 2.** The lying position for this test remains same i.e., in supine position except that his knees are bent and ankles remains in touch with his buttocks. He is asked to perform one sit-up. If he is able to perform full sit-up, he passes this test. If he is unable to raise his shoulders from the table or ground, he gets zero.

**Test No. 3.** Subject lies in supine position i.e., lies flat on his back with his Hinds behind the neck. He is asked to raise his feet 10 inches from the ground. His knees should be straight. The examiner counts to 10 seconds. He passes this test if he holds that position for ten seconds. Scoring from 0-10 depends on the number of seconds he holds the appropriate position.

**Test no. 4.** Subject lies in prone position i.e., on his stomach with a pillow under his lower abdomen and his hands behind his neck. The examiner holds his feet down. The subject is asked to raise his chest, head and shoulders, while the examiner counts to 10 seconds. He passes the test if he is able to hold the exact position up to 10 seconds. Scoring from 0-10 depends on the number of seconds he holds the exact position.

**Test No. 5.** The subject's position remains the same, but the examiner holds his chest down. The subject is asked to raise his feet. His knees should be straight. The examiner counts to 10 seconds. Scoring from 0-10 depends on the number of seconds he holds the position.

**Test no 6.** It is also known as floor-touch test. It measures the flexibility of trunk. The subject stands erect, bare footed, hands at sides and feet together. He is asked to lean down slowly to touch the floor with fingertips for 3 seconds. In this test bouncing or jerking is not allowed. The examiner holds his knees in order to prevent any bend, if it occurs. Scoring from 0-10 depends on the number of seconds he holds the position.

Q17. **Maintaining physical activities for a longer period, brings desirous changes in circulatory system. Justify your answer by highlighting three benefits of exercise.** 3

**Ans.:**
1. Cardiovascular system improves
2. Chemical composition of blood improves
3. New capillaries are formed
4. Reduction in cardiac problem
5. Decrease in blood viscosity (density)
6. Resting pulse increase
7. Return of normal pulse quickly
8. Faster adaptation to working load
9. Size of the heart increases.

(If only points are mentioned give \( \frac{1}{4} \) marks for each point)

Q.18. What is the difference between linear and angular motion? Explain through example. 3

Ans: Linear motion is any motion that moves along a straight line in one direction. The direction can either be horizontal, vertical or inclined direction. Example, approach run.

Angular motion is rotator motion, it occurs when all points on a body or object move in a circular path about the same fixed central line or axis. A child swings and rotations in hammer throw are the best example.

(If only points are mentioned give \( \frac{1}{4} \) marks for each point)

Q19. What do you understand by relative strength? Explain the importance of body weight in determining relative strength. 3

Ans: Relative strength is strength in relation to your body weight. Relative strength have a determining importance in sports in which the athlete shifts his body in space without any additional external weight. (H/J and L/J) as well as in sports in which he has to restrict his own weight within the framework of weight division

(e.g. boxing, wrestling, weight lifting etc.) e.g. if 1 RM (repetition maximum) is 50 kgs and body wt. is 50 kg and if 1 RM is 70 kg and body wt. is 50 kg, in second category the relative strength is more.

OR

Any relevant answer maintains the body weight and strength.

(If only points are mentioned give \( \frac{1}{4} \) marks for each point)
Q20. **What role an individual can play in improvement of sport environment?** 5

**Ans.:** An individual plays a very effective role in:

1. Maintaining sports facilities
2. Using essential protective equipment
3. Develop fitness of the sportsperson
4. Taking care of climatic conditions and deciding physical activities accordingly
5. Learning of proper skills
6. Proper officiating and coaching
7. Stress on drugs free environment
8. Emphasis on the attitude and behavior of coaches and other officials.

(Explain Any Five) *(If only points are mentioned give \(1/4\) marks for each point)*

Q.21 **Being sports captain of the school, prepare five important committees with their responsibilities to conduct one day run for health race.** 5

**Ans.**

1. Arrangement committee
2. Technical committee
3. Transport committee
4. Boarding and lodging committee
5. Decoration committee
6. Ground and equipment committee
7. Refreshment committee
8. Committee for officials
9. Announcement committee
10. First aid committee (Explain Any Five)

(If only points are mentioned give $\frac{1}{4}$ marks for each point)

Q22. What are the important functions of our skeletal system? 5

Ans.: 1. Attractive physical appearance
       2. Lesser sprain and pain over joints
       3. Reduces postural deformity
       4. Good body balance
       5. Better optimum physical efficiency
       6. Improves health status
       7. Better functioning of body system (Explain Any Five)

(If only points are mentioned give $\frac{1}{4}$ marks for each point)

Q.23. Explain Sheldon's classification of personality and explain its importance in physical education and sports. 5

Ans. Sheldon classification types on the basis of physique and temperament.

(a) Endomorphic: body type is solid and soft. They have tendency to store fats. They also have wider and higher waist. Their built is shorter with thick limbs. They are very fond of comfort and are sociable.

(b) Mesomorphic: body type has large bones and muscles. They easily gain or lose weight. They are assertive and energetic. They also love adventure.

(c) Ectomorphic: physique is a typical skinny person. They have a light build with small joints and lean muscles. Temperament of Ectomorphs is marked by inhibition and restraints.

OR

Personality has four basic types:
Type “A” personality: described as competitive and high achievers. They have high sense of time and always try to finish their job in time, always busy and easily aroused to anger.

Type “B” personality: extrovert, very entertaining and do not get stressed. Can be achievers but do want to be competitive. Finish work at last moment.

Type “C” personality: find about how the things work. Cautious and reserved in nature. Not assertive and suppress their desires and emotions. Susceptible to depression.

Type “D” personality: negative outlook towards life. Resist any form of change. Not adventurous and resist responsibility. They withdraw as a result of fear of rejection. Suppress their emotions.

(If only points are mentioned give 1/4 marks for each point)

Q24. What is movement speed? Explain the methods to develop speed endurance.

Ans. Movement speed is the time taken between the initiation of movement and the completion of the movement. It depends upon techniques, explosive strength, flexibility and coordinative abilities. It plays a vital role in boxing, gymnastics, swimming; throws and jumps etc. Where the minimum time is taken to complete the movement.

To develop the speed endurance we will have to work more on pace races because pace races means running the whole distance at a constant speed. Generally, 800 meters and above races are included in pace races. As a matter of fact, an athlete's can run a distance of 300 meters at full speed but, in longer races such as 800 meters or above races he must conserve his energy by reducing his speed. For example, if there is a runner of 800 meter race his best time is 1 minute 40 second, so, he should run first 400 m in 49 seconds and next 400m in 51 seconds.

(If only points are mentioned give 1/4 marks for each point)

Q25. Diet for sports persons are important. What should be the aim of preparing diet for sports person?

Ans. Aims of preparing diet for sports person:

a. Maintaining body weight and body composition desired for that specific sport
b. Maintaining adequate pool of nutrient levels in the body

c. Adopting healthy nutritional practices during training and competition.

d. Carrying on with healthy nutritional practices during off season
   as well i.e when competition are not taking place.

OR

Any other relevant answer.

*(If only points are mentioned give 1/4 marks for each point)*

Q.26. “Involvement in physical activities for longer period of the time
   with moderate intensity can improve the quality of life.” Justify your
   answer. 5

Ans.: keeping the below mentioned points into consideration one can
   justify:

1. Health
2. Self esteem
3. Goal setting values
4. Money
5. Work
6. Play
7. Learning
8. Creativity
9. Helping
10. Love
11. Friends
12. Children
13. Relatives
14. Home
15. Neighborhood

16. Community

(Explain any 5)

(If only points are mentioned give $\frac{1}{4}$ marks for each point)
(SAMPLE QUESTION PAPER)
PHYSICAL EDUCATION

Time : 3hrs Max Marks: 70

Q1 to Q11 carry 1 mark each.
Q12 to Q19 carry 3 marks each.
Q19 to Q26 carry 5 marks each.

Q1. Define ‘Test’ and ‘Measurement’?
Q2. Enlist four factors affecting motor development in children?
Q3. What do you mean by ‘PLANNING’ in sports?
Q4. Name the deformity in which there is a wide gap between the knee’s while standing.
Q5. What do you understand by Intramurals and Extramural? 2½
Q6. What are the physiological benefits of Exercise on Children?
Q7. Explain R.I.C.E.?
Q8. How can you measure cardio-vascular fitness through Harvard Step Test?
Q9. What is the significance of FRICTION in Sports?
Q10. Suggest Emotional focused coping strategies to manage stress.
Q11. What are the types of personality on the basis of psychology?

Or
How can you manage Healthy Weight?

Q12. Explain the effects of Exercise on Respiratory System.
Q13. What is the role of Diet on the performance of a sportsperson?
Q14. How Physical activities can be used as corrective measures to common postural deformities.

Q15. Elucidate the mechanical analysis of walking and running.

Q16. What is projectile? Explain the factors affecting projectile trajectory.

Q17. Briefly explain one test each for flexibility, strength and agility from RiKli & Jones-senior citizens fitness Test.

Q18. Elaborate the various aspects responsible for less participation of women in sports?

Q19. Explain female athlete Triad (Anaemia, Osteoporosis, Amenorrhea).

Q20. Explain the procedure of Administration of AAPHER, motor fitness test?

Q21. What do you mean by adventure sports? What measures will you take for safe mountaineering and how will you help in conservation of Environment?

Q22. What are the advantages and disadvantages of food supplements and weight training on children?

Q23. What do you understand by ‘combination tournament’ prepare fixtures of 16 tmers on the basis of Knock-out cline legue.

Q24. Hardik observed that due to sedentary life style his mother is (Age 52 yrs) facing health related problems. When he took her to the nearby park, he saw no. Of women struggling with the same problems and trying to over some in an unorganised way. He then decided to help them.

1. Write (any 3) health problems related to sedentary life style. $1^{1/2}$

2. What exercise shall be recommended during Menstrual Cycle/ Menopause (any 3) $1^{1/2}$

3. What measures will you take for their active participation? (any 4) 2

Q25. Explain the types of motivation. How the techniques of motivation help in achieving higher goals in sports?

Q26. What do you understand by sports injuries? Explain its types. How can we prevent sports injuries?
Class XII

PHYSICAL EDUCATION
(SAMPLE QUESTION PAPER)

Maximum Duration : 3 Hrs. Max Marks: 70

Q1. Give one most important mechanical difference between walking and running? (1)

Q2. How extrinsic motivation sometime may kill intrinsic motivation? (1)

Q3. What principle should be followed for goal setting? (1)

Q4. What do you understand by the term self-esteem? (1)

Q5. Senior Citizen who faces difficulty in tying the shoe laces while sitting on the chair, is lacking in which motor component? (1)

Q6. In which conditions knock out tournaments is better than round robin? (1)

Q7. Organizers circulated following two rules for Football Intramural, what do they intend to achieve by these-

(a) only those students who have not represented their school in Football will participate in that sport.

(b) Minimum 10 substitutions will be compulsory in 90 min game.

Q8. Explain two objectives you can achieve through adventure sports? (1)

Q9. Enlist materials which will be required for camping? (1)

Q10. What is the aim of ‘sit and Reach Test’? (1)

Q11. Why do weight lifters require lot of protein in their diet? (1)

Q12. Explain why the angle of release for a shot-put, javelin and discus are different? (3)

Q13. “Friction is a necessary evil” justify your answer with suitable example from sports? (3)
Q14. Regular physical activities cannot stop the clock of ageing but definitely it can slow. How? (3)

Q15. Flow can the minimum muscular strength of children be assessed? (3)

Q16. Explain the advantages of correct posture? (3)

Q17. In certain sport such as boxing & wrestling, players are tend to lose weight sharply. Explain pitfall of dieting? (3)

Q18. By participation in adventure sport, what leadership qualities are inculcated among Children? (3)

Q19. Based on the passage answer the following questions:

It was a sport stadium & 8 girls were standing on a track for racing. Ready! Steady! And go!

"With the sound of pistol all girls started off. Hardly had they covered 10 to 15 steps. One girl slipped and fell. Due to pain she started crying. When rest of the girls heard her crying, immediately all stopped running, stood for a while, turned back, ran towards her, joined hands together & lifted the injured-girls. Then they walked together and reached the finish line. The officials & spectators present were pleasantly shocked. Many eyes were filled with tears."

Questions:

1. What values do they teach?
2. What quality have the girls shown by walking to the finish line together?
3. What was so special about the race? (1 x 3=3)

Q20. Suggest various methods of training to improve the optimum flexibility? (5)

Q21. Participation in sports results in all round development of personality. Explain. (5)

Q22. Elaborate the adaptive effects that take place in our cardiovascular system after engaging in exercises for long period? (5)

Q23. What is the need and important sports medicine in sports and Physical Education? (5)
Q24. What do you mean by correct posture? What are the symptoms of scoliosis? How will you minimize the deformity? Give suggestions.

Q25. Elaborate various aspects responsible for less participation of women in sports? (5)

Q26. While specifying all the calculations, prepare a knock-out fixture for 21 teams? (5)
Important Notes to Remember

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Important Notes to Remember