DIRECTORATE OF EDUCATION
GOVT. OF NCT OF DELHI

Support Material
(2015-2016)

CLASS : XI

PHYSICAL EDUCATION

Under the Guidance of:

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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.

(FUNYA 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 you performance and output, remarkably. So, please make it a habit to go through the text book first and then, practise 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!

(SADMINI SINGLA)
FOREWORD

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 (048)

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   Raj Niwas Marg
PHYSICAL EDUCATION (048)

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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 compulsory include 01 Value Based Question.
CHAPTER 1

CHANGING TRENDS AND CAREER IN PHYSICAL EDUCATION

1.1 Physical Education: Definition, aims and objectives: In fact, the basis of Physical Education is difficult and very broad. With changing time, its meaning also kept changing. Following definitions clear its meaning:

According to Charles A Bucher, “Physical Education is an integral part of total education process and has its aim the development of physically mentally, emotionally and socially fit citizens through the medium of physical activities which have been selected with a view to realize these outcomes.

According to Cassidy, “Physical education is the sum of changes in the individual caused by experience which can bring in motor activity.

Aims and Objectives:

“The aim of physical education must be to make every child physically, mentally and emotionally fit and also to develop in him such personal and social qualities is will help him to live happily with others and build him up a good citizen.”

It main aim is all round development and it can be attained through different steps or objectives:

1. Physical development
2. Neuro-Muscular Development
3. Mental development
4. Social development.
5. Emotional development
6. Development of health
7. Intellectual and personality development.

1.2 Post Independence Development of Physical Education: After 15 August 1947, the development of physical education moved in a new direction. Many organizations were set up for the development of physical education as per following details:

I. The central Advisory board of physical Education and recreation:

This was set up in March 1950 under the presidency of Dr. Tara Chand along with 10 other members. Its first Meeting was held on 19 March 1950. In 1958, a meeting of the principals of all the colleges of the country was held in Madras in which emphasize was put on imparting physical education.

II. All India Council of Sports:

The central Government prepared a policy to boost games and sports in India. In 1954, the Union Minister Maulana Abdul Kalam Azad called a meeting of the heads of different sports associations. Retired Admiral General K.M. Kariappa was appointed as its first president.

III. Netaji Shubhash National Institute of Sports:

In 1958, a Committee was set up Headed by the Maharaja of Patiala to make an inquiry about India’s poor performance and down ward slide in Olympic games. The Government of India established Netaji Shubhas National Institute of Sports in March 1961. It was inaugurated by Dr. Sreemali.

1.3 Integrated Physical Education: Concept and Principles

Concept: Under this, one must have the Knowledge of different sub topics and their utility, so that the students could be trained properly. The knowledge of integrated physical education will promote the fitness and wellness of the individuals. It will help is designing high quality programmers.

1.4 Adaptive Physical Education: Concept and Principals.

There are many children who suffer from various types of disabilities like mental retardation, deafness, blindness, speech impairment etc. For such children
special programme may be organised, so that physical, musical, cognitive, social and emotional abilities can be developed in them.

**Principle:** For successful implementation of adaptive physical education, certain principle may be kept in mind such as medical examination, interest and capacity of the student, appropriate equipment, proper environment, specific instructional strategies etc.

### 1.5 Special Olympic Bharat:
This organisation prepares the progress with physical and mental disability for special olympics. At national level, they are trained to participate in 24 single and team games by the sports Authority of India. This organisation was established in 2001 as per the act of 1982.

**Career option in physical education:**

<table>
<thead>
<tr>
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<th>2. Coaching Career</th>
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<td>i. Elementary school level</td>
<td>i. Administration relates course</td>
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<td>ii. Middle School level</td>
<td>ii. Physical Education Department</td>
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<td>iii. High School and senior secondary school level</td>
<td>iii. Sports Department</td>
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<td>iv. Collage and University level</td>
<td>iv. Industrial recreation</td>
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<td>v. Sport facilities Management.</td>
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<th>3. Health related career</th>
<th>4. Performance related career</th>
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<tr>
<td>i. Health club</td>
<td>i. As Professional player</td>
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<td>ii. Athletic training</td>
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<th>5. Career in communication and midis:</th>
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<td>i. Sport Journalism</td>
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<td>iii. Sports photography</td>
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<td>iv. Book publication</td>
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<td>v. Sports broad casting</td>
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QUESTION FOR 1 MARK [30 WORDS]

1. What is the aim of physical education?
   Ans. The aim of physical education is all round development of the personality of the individual.

2. What do you mean by sport journalism?
   Ans. Such PETs who have skills in communicating by oral or writing can avail the career option in the field of sports journalism.

3. What is adaptive physical education?
   Ans. Through adaptive physical education disable students are encourage to participate in safe, satisfactory and physical activities.

4. When was sports Authority of India established?
   Ans. The sports Authority of India was established by the Govt. of India in January 1984.

QUESTION FOR 3 MARKS [60 WORDS]

Q.1. Describe the principles if integrated and comprehensive physical education.
   Ans. i. It should be based on the inter related sub-topics of physical education.
        ii. It should cater to the requirements of different people.
        iii. It should be capable of facing the challenges of the present and the future.
        iv. It should be capable of providing comprehensive and deep knowledge about physical education.
        v. It should motivate an individual to engage in a lifelong healthy and active lifestyle.
        vi. It should be able to develop social and emotional skill among people.

Q.2. Write a note on the teaching career in physical education.
   Ans. Teaching career is appropriate for those people who are really interested in it one can choose one’s career in elementary schools, middle schools,
high schools and schools and colleges according to one’s educational qualification. Teachers enjoy lots of respect among their students because the teacher contributes a lot to the society. It also provide inner satisfaction.

Q.3. Discuss the programmes of the sports Authority of India.

Ans. i. To search and nurture sports taken:

Through this talented children are researched. they are property trained and provided other facilities. So that the level of sports many go up in India.

ii. To provide Sports scholarship:

Players are given sports scholarships according to their achievements. for this purpose, a merit list of their achievement at national level is prepared.

iii. To organise national sports talent competition time to time sports competition are held at national level to select talented players.

iv. To promote indigenous games and marshal art: Competitions are organised to promote indigenous sports and marshal arts. Such competitions are organised continuously in north - eastern states of India.

QUESTION FOR 5 MARKS [150 WORDS]

Q.1. What are the main objectives of physical education.

Ans. i. Physical development: Its main aim is physical development physical activities enhances the size, shape and capability of different organs which is good for healthy body, healthy citizen can only contribute in nation - building.

ii. Mental development: Physical activities makes the mind aware and helps in increasing concentration.

While playing, many situations arise when player’s have to take independent decisions, thus it relates to mental development.

iii. Social Development: Its aim is to develop social qualities in individual which is very important for making adjustment in life. Player get many
opportunities to come near to each other which develop many qualities like, unity, friendship, cooperation, respect, sportsmen spirit, brotherhood, assurance etc.

iv. Emotional Development: One of its main aim is emotional development of individual different activities of physical education teach how to have control over impulse. One has to control different feelings in different situations like pleasure, hope, jealousy, sorrow, anger, fear etc.

v. Neuro-muscular Development: Physical activities develop coordination between nervous and muscular systems. A healthy nervous system keeps the unnecessary fatigue away. It reduces reaction time of the player and increases the speed. Thus the main aim of physical education is to develop co-ordination between them.

Q.2. Describe the objectives and role of the central advisory board of physical education and recreation:

Ans. Objectives:

i. To introduce physical education as compulsory subjects in schools.

ii. To suggest all the educational institutions of the country in preparing syllabus.

iii. To suggest the qualification for the selection process and training of the physical education teachers.

iv. To introduce physical education at elementary middle, high school and university level and prepare course-content accordingly.

Role of the Board:

i. The board suggests bold steps for physical education and prepares syllabus for the certificate and diploma courses to the Govt. of India.

ii. To suggest different physical training methods for the boys and the girls to the centre.

iii. The union education ministry started scholarship in 1958 in the fields of leadership training, research etc.
iv. The union education ministry started giving monetary help to the organizations running programmes related to national physical efficiency test after 1958.

v. Many steps were taken to run the physical education programes successfully at state level.

vi. Many steps were initiated to write, publish, encourage and popularise physical education.

vii. On board's suggestion, the central govt. has started many programmes related to national health core in different educational institutions of India.

Q.3. Describe the aims and objectives of Netaji Subhash National Institute of Sport.

Ans. i. To prepare coaches for imparting special training in different games and sports.

ii. To enhance the technical skills of the coaches

iii. To make available a latest information in the field of sports.

iv. To help in searching talented players.

v. To impart proper training to the players to participate at the international level.

vi. To provide scholarships to the players to encourage them towards sports.

vii. To help 'Nehru Yuva Kendra's in order to encourage games and sports.

viii. To impart technical knowledge to the industry engaged in the field of making sports related equipments using latest technology.

ix. To promote publication of different sports magazine for the development of sports.

tax. To promote research work in the field of sports.

xi. To organise refresher courses for the teaching of physical education.
Q.4. Which principal are required to be followed to make the adapted physical education effective? Explain.

Ans. i. Medical Examination: It is very important for the success of programmes related to adapted physical education. Otherwise, it will be difficult to find out what kind of disability, the student is suffering from. Therefore, it is imperative to conduct medical examination of the students.

ii. Programmes according to the interest of the students: Programmes should be made keeping in mind the interest, capacity and previous experience of the students. The teachers should also have deep knowledge about. It, then only they can make any successful programme.

iv. Equipment should be appropriate: Students should be provided with equipment as per disability concerned. For example, students suffering from visual impairment should be given a ball with bell so that they may catch the ball as it rolls because of the sound. Thus such students can make out. The direction and distance of the ball.

v. Proper Environment: The play area also should be limited because of the limited speed capacity of the children. For example, speech impaired children should be given rest in between the games. The play area should be limited to top smaller area.

vi. Modification of Rules: Rules and regulations of the games and sports should be modified depending on the specific needs of students. In order to learn new skill they may be given extra time, extra effort, extra rest and 2 marks in place of 1 mark.

Thus, they might be given the opportunity for all round development.

Q.5. Write a note on special Olympic - Bharat?

Ans. This organisation was established in 2001. It's aim is to increase the participation of disable people in games and sports. Its another objectives was to develop leadership quality social quality and health.

This organisation organises sports competition at state and national level. It also serve talented players and train them for international games. After 2002, about 23,750 participants have participated in national games.
Between 1987 and 2013, a total of 671 Indian athletes participated in seven summer and five winter special Olympics. They won 246 gold medals, 265 silver medals and 27 brown medals and they raised the glory of the country in the world.

Today, around 1 million athletes are the member of this organisation and 84950 coaches train these athletes. This organisation does the all round development of the players through games and sports.
a. Meaning and Importance of physical fitness, wellness and lifestyle

Meaning of Physical fitness → Physical fitness means the capacity to do the routine work without any fatigue or exertion and after doing the work the person has power to do some more work and recovery is quicker.

Wellness → Wellness is the capacity of an individual by which he leads a balanced life

Life style → A way of life or style of living that reflects the attitude and values of a person or group

Importance of physical fitness, wellness and lifestyle

1. SHARP MIND
2. TO LIVE LONG AND HEALTHY LIFE
3. ENJOY LIFE MORE
4. IMPROVE YOUR MOOD
5. MAKE BONES STRONG
6. BOOST ENERGY STRENGTH AND STAMINA
7. KEEP BODY FAT OFF
Active life without stress

Improves health

Become active member of society

Good citizen

Achieve optimum growth and development

Healthy and happy life

Importance of Healthy Lifestyle

Enable you better cope up with stress

Reduce Health problems

Improve Abilities
Components of Physical Fitness

There are five physical fitness components. They are directly or indirectly related to each other.
Preventing Health threats Lifestyle through Lifestyle changes

> Preventing Health threats Lifestyle through Lifestyle changes

Healthy Lifestyle Prevents Health Threats

- Sufficient sleep
- Regular Physical exercises
- Limiting the Amount of Alcohol
- Health eating habits
- Maintaining healthy weight
- Limit T.V. watching
- Prevention of Injury
- Quit for smoking

COMPONENTS OF WELLNESS

Environmental wellness
- Ability to promote health measures that improve standard of living.

Emotional Wellness
- Ability to control stress emotions appropriately

Intellectual wellness
- Ability to learn and use information effectively

Physical wellness
- Ability to carryout daily tasks

Occupational Wellness
- A balance between work and leisure

Social Wellness
- Ability to interact with people

Spiritual Wellness provide meaning and direction in life

Intellectual Wellness - Ability to learn and use information effectively
Q1. Define Physical fitness?

Ans. According to Encyclopedia. “It is the ability of a person to do daily routine work without fatigue, moreover to participate in playful activities and skill reserves enough capacity to meet any emergency.

Q2. What do you mean by wellness?

Ans. wellness is the maximum capacity of individual to lead a well balanced life related to good health, active physical life, positive mental abilities, well adjusted social life, psychological balance, balanced emotional life, good spiritual life release to stress etc.

Q3. What is meant by Lifestyle?

Ans. Lifestyle is the typical way of life of an individual, group and culture. Lifestyle is a way, a person leads his/her life. It includes the patterns of
social relation, consumption, entertainment and dress. It also reflects persons self image or self concept, the way they see themselves and believe that they are seen by other persons.

Q4. Mention the health threats in life

Ans. Health threats in life
- Heart diseases
- Cancers
- diabetes
- COPD (Chronic Obstructive Pulmonary Disease)
- Hypertension
- Kidney disease
- Obesity
- Arthritis
- Depression and
- Injuries.

Q5. List down the component of positive Lifestyle

Ans. Physical fitness, Personal Hygiene and healthy habits, Medical checkup, Good Posture, Medical care and Recreate yourself.

Q6. Explain the meaning of Health.

Ans. Health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity “Health means wealth”

**SHORT ANSWER TYPE QUESTIONS (60 WORDS) CARRYING 3 MARKS.**

Q1. Briefly explain the importance of wellness

Ans. Importance of wellness
- It helps in the improvement and toning up the muscle.
- It reduces the recovery time after injury or illness.
- It helps in fulfilling proper nutritional requirements.
- It helps in better management of stress and tension.
- It helps people to meet the challenges of life and also unforeseen situations as and when required.
- Regulates and improves overall body functions.
- Motivate positive Lifestyle habits or changes.

Q2. Discuss ‘healthy diet’ as a component of positive Lifestyle

Ans. Healthy diet or good nutrition is one of the main components of positive Lifestyle. In fact, a healthy diet or good nutrition is necessary to lead a healthy or positive Lifestyle. The basics of a healthy diet are lots of fresh fruits and vegetables, wholegrain foods and low fat diary products. Such diet is required everyday in order to maintain the adequate amount of vitamins nutrients and minerals needed to maintain a healthy body. That is why it is rightly said that to eat is necessity but to eat intelligently is an art.

Q3. Why is a Healthy Lifestyle important.

Ans. A healthy Lifestyle is a valuable resource for reducing the incidence and impact of health problems, enabling you better to cope with life stressors, as well as improving your quality of life.

Many health problems can be prevented or at least their occurrence postponed by having a healthy Lifestyle.

Many health problems are addressed or cured by exercise, nutrition, stress management and other healthy Lifestyle Practices.

Q4. Health is “an asset” Comment.

Ans. 1. It is said that “a sound mind is in a sound body”. The low health status is a burden.

2. Unhealthy people has to depend upon others, moreover, a lot of money is spent on medicines to improve or maintain the health status.
3. If our health is good, we can face any kind of situation in our life with peace and enjoy the life.

**Q5. It is health which is real wealth, and not pieces of gold and silver comment.**

**Ans.**
1. Good health keeps us always happy and gives no feeling to complete physical, mental, social and intellectual well being.
2. A good health keeps us away from the diseases and health disorder.
3. The loss of good health causes loss of all the happiness.

**LONG ANSWER TYPE QUESTIONS (150 WORDS) CARRYING 5 MARKS**

**Q1. Explain the importance of physical activity on enhancing the life.**

**Ans.** Physical activity is a vital component of positive Lifestyle.

1. **Reducing Anxiety :** Exercise reduces the symptoms of anxiety such as worry.
2. **Reduce stress, depression and imporves mood.**
   Regular physical activity reduces the body’s overall response to all forms of stressors and help people to deal more effectively with the stress, they experience.
3. **Reduces the risk of chronic diseases :** Physical training is a process of producing long term improvement in body’s functioning though exercises. Exercise reduce the risk of developing or dying from heart diseases, diabetes, high blood pressure colon cancer, obesity, depression and reduced spending for health care.
4. **Reduced risk of becoming obese :** Too much body fat is linked to a variety of health problems. Excess calories are stored in the body as fat. Regular exercise increases dialy calorie expenditure so that a health diet is less likely to lead to weight gain.
5. **Improves psychological emotional well beings**
Performing physical activities provides an opportunity to skill mastery and self control. Fit people can maintain their physical and mental well being throughout their lives.

Q2. **What do you mean by the term physical fitness? Explain the component of physical fitness in detail.**

Ans. Physical fitness is the total functional capacity of an individual to perform a given task. It means that it is the body’s ability to function efficiently, to enjoy leisure time, to be healthy, to resist hypokinetic diseases and to meet unforeseen situation. It consists of health related fitness and skill related physical fitness. Physical fitness and exercises habits developed in early years provide a foundation for life time. Since activity is the basis of life and human body cannot remain in normal condition without activity therefore optimal physical fitness is not possible without regular exercise.

Components of physical fitness

There are five physical fitness components. These are

- Speed
- Strength
- Endurance
- Flexibility
- Coordination

- **Speed**: It is the ability to perform movement at faster rate or. It is the ability to perform movement in a short period of time and sports e.g. practicing with faster rhythm, speed endurance repetition method, acceleration runs etc.

- **Strength**: It is an ability of muscles to overcome or to act against resistance e.g. exercise with medicine ball, Isometric exercises, pushups etc.

- **Endurance**: It is the ability to sustain or continue activity or it the ability to resist fatigue. It is one of the important components for middle and long distance races ad it is required for almost all major games like football, hockey and basketball.
- **Flexibility**: It is the capacity of a muscle to extend without any damage. Flexibility is measured by range of motion around a joint. It is affected by muscle length, joint structure and other factors. It is measured through flexometer.

- **Co-ordinate ability**: It is the ability of the body to perform movement with perfection and efficiency. In other words it is ability to change movement or direction in the shortest time without getting unbalanced.

**Q3. Describe the components of wellness**

**Ans. Components of wellness**

Wellness is the ability to lead a well balanced. Life style relating to physical health, mental health, social health and emotionally balanced life. There are many components to bring wellness all these also develop optimum health.

1. **Physical activity**: It makes the person fit and active. It improves various system of body and improves our health. It also improves our growth and development.

2. **Balanced Emotional Life**: Wellness requires balanced emotional life and release of emotions, moreover it should be under control.

3. **Intellectual Attitude**: Wellness requires positive intellectual attitude. It improves our behaviour, intelligence, alertness, futuristic and insight thinking.

4. **Spiritual wellness**: It makes the person ethically good, morally good, peaceful, moreover guides the value of life.

5. **Occupational Wellness**: It makes the person to be hard worker and earn the livelihood with honesty. It helps to achieve the balance of work and leisure and gives satisfaction.

6. **Managing stress**: Wellness needs the proper management of stresses and tensions of life. It keeps us calm and controls our anxiety.

**Q4. What are the essentials for a healthy life style?**

**Ans.** A healthy Lifestyle doesn’t happen overnight it takes sometime depending upon our habits.
1. **Regular exercise**: It keeps a person fit perform all routine work without any difficulty. Thus one should participate in physical activity, moreover it’s a symbol of good health.

2. **Eat a balanced diet**: A balanced diet includes healthy food choices from all the food groups (according to age, gender, climate etc) on the other hand unbalanced diet, Fast food, junk food cold drinks, toffees, candy etc are the causes of many chronic problems.

3. **Refrain from bad habits**: Refrain from bad habits such as smoking, drinking Alcohol and drugs etc. These are the bars to a good health.

4. **Proactive about your health**: Seeing your doctors for medical check ups regularly is an important healthy Lifestyle feature. It not only ensures that you are on the right track but any health issue that does come up is easier to treat if discovered early.

5. **Have fun**: Have you, noticed how much better you feel when you smile or laugh? Having a positive outlook and making sure you take time out to have fun which can actually have a positive affect on your health too.
ANCIENT AND MODERN OLYMPIC

Ancient Olympic Games - In the Ancient time the games were held in honour of god Zeus. Since then the games were the greatest religious festival in the life of the Greeks. There were lots of stories about the origin of Ancient Olympic games. The word Olympic is derived from Olympia a valley, where first such games were organized.

Modern Olympic Games - For revival of Modern Olympic games credits goes to the Baron Pierre de Coubertin of France. With his great effort/the first Modern Olympic games were held in Athens in 1896. There were nine countries who participated in First Olympic games.

Olympic symbols - The Olympic flag has five interlocking rings, represented five continents of world.

Objectives of Olympics -

1. To develop personality, characters, citizenship among nations.
2. To develop good habits among sportspersons.
3. To pay attention towards physical education and sports Competitions among countries.
4. To develop International fraternity and peace.

Development of values through Olympics – Olympics has developed following values among sportspersons.

1. Friendship
2. solidarity  
3. Fair play  
4. Free from discrimination  
5. Free from drugs

**International Olympic Committee (IOC)** - It is the highest body which is controlling the Olympic games. It was formed during the International Athletic Congress held in Paris in June 25, 1894, With the efforts of Baron de Coubertin. The Headquarter of IOC are located in lousanne(Switzerland).

**Para Olympics** -This is similar to Olympic games for disabled sportspersons. In 1960 first time they were organized in Rome. The headquarter of International Para Olympic is situated at Bonn,Germany. The International Para Olympic(IPC) is responsible for organizing summer and winter Olympic games. At present it comprises of 176 National Para Olympic Committees.

**Indian Olympic Association**- Indian Olympic Association(IOA) was formed in 1927, Mr.Dorabji Tata was its first president. Indian Olympic Association is affiliated with International Olympic Committee. The Indian Olympic Association executive board consists of various members like president, Vice-president, Secretary, joint-Secretary, treasurer and state Olympic associations and representatives of national federations.

**SPORTS AWARDS** -There are following awards for prestigious coaches and outstanding sportspersons, given by the Govt. of India.

**Dronacharya Award**- It is for the coaches who’s Athletes perform outstanding performance in International competitions. This Award was started in 1985 in the memory of Guru Dronacharya of Mahabharata. Five lakh rupees cheque, statue of Arjuna and scroll of Honour is given to the awardee.

**Arjuna Award** - It is given to those sportspersons for outstanding performance in International/national competitions. This Award was started in 1961. This award is given in the memory of Arjuna of Mahabharata.

**Rajeev Gandhi Khel Ratna Award** - This award was instituted by the Rajeev Gandhi Trust in the year 1991-92. This award is given for most spectacular and outstanding performance by a sportspersons. This Award is presented to one sportperson from individual sports but it can be given to more than one person.
in case of team events. Seven lakh and fifty thousand rupees cheque, a medal and scroll of honour is given to the awardee.

**Organisational Set-up of CBSE Sports** - The Central Board of Secondary Education, is the highest authority to conduct games & sports tournaments at cluster, zonal and national level in various games & sports annually.

**Chacha Nehru Sports Award** - This award/scholarship is started by the CBSE for talented students of classes 9 to 12 for their outstanding performance in CBSE affiliated games and sports. This award is in the form of scholarship and it motivates the students to excel in their sports activities.

### VERY SHORT ANSWER (1 MARK QUESTIONS) [30 WORDS]

1. **write a short note on the Olympic Flag?**

   **Ans.** Olympic Flag was created in 1913 at the suggestion of Baron Pierre de Coubertin. It was first hosted in 1920 Olympic games at Antwerp (Belgium). It is made of white silk and contains five inter-locking rings in five colours: yellow, green, red, blue, and black representing the five continents of the world. The inter-locking rings symbolise cooperation and friendship.

2. **Briefly explain development of values through Olympic movement?**

   **Ans.** The aim of Olympic games is to create peace and cooperation amongst the nations with the spirit of sports competition. Olympic games played a significant role to develop following values:

   1. Friendship
   2. Solidarity
   3. Fair play
   4. Freedom from discrimination

3. **What is Olympic oath?**

   **Ans.** At the beginning of the games the host country representative will take oath on the behalf of all participating athletes. That is “We swear that we
will take part in the Olympic games in loyal competition representing and abiding by the rules which govern them without the use of doping and drugs in the true spirit of sportsmanship for the glory of sport and the honour of our teams”.

4. Describe in brief the eligibility criteria for Dronacharya Award?

Ans. This award is for coaches whose Teams or players have shown outstanding performance in international/national competitions. The following capabilities are necessary for the eligibility of this award:-

1. The player who has won gold, silver or bronze medal at Olympic or world cup championship.

2. The player who has broken the world record. This record should have been recognized by the international sports federation.

3. The player who has won the gold medal at Asian or Commonwealth championship.

4. The player who has won gold medal at least three times in Asian or Commonwealth championships.

5. Describe the objectives of CBSE sports?

Ans. The central Board of Secondary Education conducts the various tournaments at various level to promote games & sports in India. There are following objectives of CBSE sports.

1. To raise the general standard of sports.

2. To organize orientation, refresher and training programmes for physical education teachers.

3. To organize inter-school tournaments and competitions.

4. To encourage sportsmanship and promote friendly relations among schools.

6. Write a short notes on the origin of Para Olympic Games.

Ans. In the second world war majority of people suffered. They lost their will power and kept remembering the horrors of wars all the time. In 1948 Sir Ludwig gutman organized games for disabled soldiers in various hospital
in London. In 1960 Rome Olympic sir Ludwig collected 400 disabled athletes and organized games, and it was named Para-Olympics. Shooting was the first game to be introduced in Para Olympic Games. The International Para Olympic committee(IPC) is responsible for organizing summer and winter Olympic games. The headquarter of IPC is situated in Bonn(Germany) The symbol of para Olympic Games is three colours red, blue and green flag and the Motto of Para Olympic is “spirit in Motion”. 2014 winter para Olympic Games was successfully hosted by Russia.

**LONG QUESTIONS [5 MARKS] [150 WORDS]**

1. **Explain the origin of Ancient Olympic Games?**

   **Ans.** The sports was by no means a Greek invention. Despite severe conditions of life at the dawn at history, men found time to enjoy a variety of sports. According to available history, the first ancient Olympic games were started in Olympia Valley in 776 B.C. at that time the games were held in honour of God Zeus, later on Hercules, the son of Zeus started the games and sports in the honour of his father. Although there was lot of stories about the origin of ancient Olympic games. According to some other learned persons there was a wrestling competition between God Zeus and God Koronos in which God Zeus became the winner. To celebrate the victory, the organization of games and sports was started. Whatever the reason behind the beginning of the game Olympic Games was, but it is certain that these games were organized first time in beautiful valley names ‘Olympia’, due to this fact these games were called Olympic Games. during the games period or month any war or dispute might be taking place, would be stopped at once and a truce would be declared. The games were conducted in following way:-

   1. Opening ceremony
   2. Assembly
   3. Oath
   4. Events
   5. Awards
The Ancient Olympic Games continued and was held for approximately thousand years. In 394 A. D. Theodosius, the King of Rome stopped the organization of games, stadiums were destroyed and revived after many decades, that Called Modern Olympic games.

2. **Write down in details about International Olympic Committee.**

**Ans.** The International Olympic Committee is the governing body of the modern Olympic games. It is committed to support and promote participation in sports throughout the world. The International Olympic Committee has its headquarter in Lusanne, Switzerland. It was created by Pierre.Baron de Coubertin on 23rd June 1894. Greek Demitrios Vikelas was its first president. Its memberships consists of 105 active members and 32 honoury members. The International Olympic Committee (IOC) organizes the summer and winter Olympic games every four years. The first summer Olympic games by the International Olympic Committee were held in Athens, Greece in 1896. where as the first winter games were held in Chamonx, France, in 1924. From 2010 the IOC has started to organize to the summer and winter youth Olympic games. The first summer youth Olympics were held in Singapore in 2010, where as the first winter Youth Olympics were held in Innsbruck in 2012.

IOC Governing Body:- International Olympic Committee consists of members from the various countries:

President:- The President of IOC is elected by its members for a term of eight years. The current IOC president is Jacques Rogg.

Vice-President:- In the IOC four vice-presidents are elected. They are elected for four years.

Executive Board:- The IOC Executive Board consists of president, vice-president and ten other members.

Main Functions of IOC:- The IOC performs a numbers of functions which areas under:-

1. The IOC decides the venue and date of Olympic games

2. It also ensure the regular celebration of the Olympic Games.
3. For conducting the competition and general for the Olympics, fundamentals rules set by this committee.

4. It also acts against any form of discrimination Affecting the Olympic Movement.

5. It leads the fight against doping in sports.

3. Describe the formation and objectives of Indian Olympic Association.

Ans. Indian Olympic Association was established in 1927. Sir Dorabji Tata and Dr. Noehren became the founder President and General Secretary of the is affiliated to International Olympic Committee. The election of the office bearers of the Indian Olympic Association is held after every four years. The council consists of various members:-

President.

Vice- President:- nine vice presidents

Joint Secretaries:- six joint secretaries

Secretary General:- one

Executive Members:- One honorary Treasurer, seven representative of state Olympic associations and twelve representatives of national sports federations.

Objectives of Indian Olympic Association:-

The main objectives of Indian Olympic Associations are:-

1. Enforcement of all rules and regulations of International Olympic Committee and Indian Olympic Association.

2. Development and Promotion of the Olympic Movement.

3. To take disciplinary action against any federation for misbehavior or any other undesirable activity bringing discredit to the nation.

4. To co- operate with national sports federations/associations, organize and control selection, training, coaching of the team that will represent India.
5. Admitting the members of state Olympic Associations/National sports federations which submit their annual reports and audited statements of accounts necessary.

4. **Enlist the various Sports Awards and explain any one award in details?**

**Ans.** Recognition of any outstanding achievements is highly motivating and more so when it comes from the top functionary of prevailing system. The Government of India, in recognition of meritorious achievements in games and sports has instituted following National Awards for outstanding sportspersons and coaches.

1. **Arjuna Award**

2. **Rajeev Gandhi Khel Ratna Award**

3. **Dronacharya Award**

**Arjuna Award:** Arjuna award is the supreme honour, which is awarded to sportspersons by the Government of India. This award is given to such sportspersons who has given extraordinary performance during the past three years. This award was started in 1961 in name of (Mahabharata Arjuna) This award includes a statue of Arjuna, a diploma and five lakh rupees cash. The President of India presents this award on 29 August (The birthday of legendary, hockey wizard Late Dhyan chand, Olympian) every year.

Selection committee: - Consists of five Olympians, four Arjuna Awardees, Two sports Administrators and one sports secretary.

Rules for Arjuna Awards: - Its main aim is to improve the standards of sports in country.

2. The government of India demands the list of sportspersons from National sports Federations which is recognized.

3. The total numbers of Arjuna Award are restricted to 15, one award in each discipline, however in can be increased in extra-ordinary performance by a sportsperson.
4. Sports Federation send a list of three players, in which one will be selected but in case of female two awards will be given one male and one female.

Categories of competitions:- 1. Olympic/Asian/Commonwealth Games and Cricket.

2. Indigenous Games

3. Physically Challenged Category
CHAPTER 4

YOGA

4.1 Meaning and Importance of Yoga:

Meaning:
The term ‘yoga’ is derived from a Sanskrit word ‘Yuj’ which means join or union. In fact joining the individual self with the divine or universal spirit is called yoga.

- Patanjali: ‘Checking the impulses of mind is Yoga.’
- Mahrishi Ved Vyas: ‘Yoga is attaining trance.’
- In Bhagwat Gita, Lord Krishna says, “Skill in actions or efficiency alone is yoga.”

Importance of yoga

1. Keeps the body healthy.
2. Prevention & cure from diseases
3. Increases flexibility
4. Increase the efficiency of heart and lungs
5. Increases memory power
6. Spiritual Development
7. Reduces fatigue and stress
8. Reduces Obesity
9. Control over senses
4.2 Yoga as on Indian Heritage:

History of yoga is as old as the history of Indian culture. Although, there is no written proof in this regard. Yoga is known as the heritage of India only should go through the related periods of history.

### History of yoga

<table>
<thead>
<tr>
<th>Pre-Vedic Period</th>
<th>Vedic Period</th>
<th>Upanish Period</th>
<th>Epic Period</th>
<th>Sutra Period</th>
<th>Smviti Period</th>
<th>Medieval Period</th>
<th>Modern Period</th>
</tr>
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</table>

4.3 Elements of yoga:

Around 147 Bc, Patanjali developed a system of yoga that contains Eight steps also known as ‘Astanga Yoga.

### Aslaga Yoga

<table>
<thead>
<tr>
<th>Yavna</th>
<th>Niyama</th>
<th>Asana</th>
<th>Pranayama</th>
<th>Pratyahara</th>
<th>Dharana</th>
<th>Dhyana</th>
<th>Samadi</th>
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</thead>
</table>

4.4 Introduction to Asanas, Pranayama, Mediation and yogic Kriyas:

**Asanas:**

Asana is 'to be seated in a position that is firm and relaxed' for extended periods.

**Pranayama:**

Pranayam means extension of the breath of extension of the life force. ‘Prana’ means life force and ‘Ayama’ means control. There are three parts of Pranayama:

1. **Purka** - Means inhalation
2. **Rechaka** - Means exhalation
3. **Kumbhaka** - Means retaining the breath

**Types of Pranayam:** Suryabhedi, Ujjayi, Sheetkari, Sheetle, Bhastriya, Bhramari, Plavini, Moorcha etc.
Meditation:

Meditation: means concentration of mind, resulting in Samadhi.

Yogic Kriya:

Yogic Kriya are cleansing techniques that cleanses various internal as well as external organs of the body. There are six yogic kriyas also known as ‘Khsatkarm Kriyas’.

1. Neti Kriya 6. Kapalabhati Kriya
2. Dhayti Kriya 5. Trataka Kriya

4.5 Body related benefits of Asana and Pranayam

Improves concentration power, correct body posture, Rehabilitation of injuries, Increases flexibility, Improves breathing system, Improves function of heart, Improves digestive system, Improve overall health, Improves coordination of function between neurology and muscles.

4.6 Prevention and Management of common Lifestyle diseases: obesity, Diabetes,

Obesity:

Obesity is a medical condition when the body of a person contains 20% or more fat as compared to ideal weight.

According to WHO, the BMI = \( \frac{\text{Weight in Kg.}}{\text{(Height in Mtv)}^2} \)

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI</th>
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<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5 - 24.9</td>
</tr>
<tr>
<td>Over Weight</td>
<td>25.0 - 29.9</td>
</tr>
</tbody>
</table>
Class I Obesity 30.0 - 34.9
Class II Obesity 35.0 - 39.9
Class III Obesity $\geq$ 40.0

**Diabetes:**

Diabetes is a metabolism disorder in which the person has high blood glucose may be either due to inadequate production of insulin or the body cells do not respond properly to the insulin produced by the pancreas. There are two types of diabetes.

1. Type I diabetes: In this type of diabetes, the body does not produce insulin.
2. Type II diabetes: In this stage of diabetes, the body does not produce enough insulin for proper functioning of the cells in the body and do not react to insulin.

**Hypertension:**

High blood pressure or hypertension means high pressure in arteries. It is measured in mm/Hg.

<table>
<thead>
<tr>
<th>Type of Blood Pressure</th>
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<td>↓</td>
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<tr>
<td>1. Systolic Pressure</td>
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<tr>
<td>It is Pressure created when the heart beats</td>
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<tr>
<td>2. Diastolic Pressure</td>
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<td>↓</td>
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<tr>
<td>It is the Pressure inside blood vessels when the heart is at rest</td>
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**Back pain:**

Back pain is a pain felt in the back that usually originates from the muscles, nerves, bones, joints or other structures in the spine. Main causes of back pain are lack of physical activities, lack of flexibility, smoking, excessive pressure on back etc.
I. MARK QUESTION
(VERY SHORT ANSWER QUESTIONS) [30 WORDS]

Q1. Define yoga.
Ans. Unification of jivatma with parmatma is called yoga.

Q2. What is Dhayana?
Ans. Complete concentration of chitta (Mana) is called Dhiyana.

Q3. How is BMI measured?
Ans. Weight in Kg.
\[(\text{Height in Mtr})^2\]

Q4. Name the various elements of yoga.
Ans. Yama, Niyama, Pranayama, Pratyahara, Dharana Dhyan, Samadhi etc.

Q5. Classify different types of Pranayama.
Ans. 1. Purka
2. Rechaka
3. Kumbhaka

Q6. What is Yama?
Ans. It is the first element of ‘Astanga yaga.’ Through the practice of yama one can abstain from stealing, lying, cheating, killing and other exploitative behaviour, various elements like ahimsa, satya, Astaya, Brahmacharya and Aparigraha etc. are excluded in this.

Q7. What do you mean by yoga sutra?
Ans. Patanjali gave us the present literary form of yoga in ‘yoga sutra’ in approximately 147 BCE.

Q8. Outline any two importance of yoga
Ans. 1. It controls the Kaph, Vaat and pitt and increase physical as well as mental purity.
2. It increases the immunity power of the body which help in preventing diabetes, hypertension, heart disease etc.

**3 MARKS QUESTION**
(SHORT ANSWER QUESTION) [60 WORDS]

**Q1.** Describe the benefits of pranayama.

**Ans.**
1. Pranayama is as necessary for the mental purity as bathing is necessary for physical purity. Yogic kriyas such as neti, dhanti, kapalbhati etc. controls the kaph, vaat an pitt.

2. Continuous performance of mayurasans and other yogic kriyas increases facial beauty and makes the skin glow.


**Q2.** Write a short note on dhayana and Samadhi.

**Ans.**
**Dhayana :**
It refers to meditation or a sense of radical self awareness. It is a stage prior to Samadhi. Dhayana is part of life. In fact, complete concentration of mind is called dhayana.

**Samadhi :**
In Samadhi the Atma gets united with the paramatma. Samadhi state is attained when self awareness dissipates completely too, feel divine pleasure after attaining the state of Samadhi. One experiences the virtual truth.

**Q3.** Suggest any three exercise dependent remedies and any three diet dependent remedies.

**Ans.**
**Exercise Dependent Remedies :**

1. **Regular Physical Exercise:**
   Obesity can be controlled by practicing various aerobic exercises, jogging, cycling, dance etc. for at least 60 minutes every day.
2. **Yogic Exercises** :
   Obesity can be reduced by practicing various types of asanas and other yogic exercise.

3. **Resistance Exercises** :
   These exercises strengthen tendons and ligaments. While performing such exercise one must fix the number of repetition rather than amount of weight lifted. These are considered safe and good for wealth.

**Diet Dependent Remedies** :

1. **Avoid fatty foods**:
   Fats provide maximum calories to the body, extra fats are stored in the body. In order remain slim one must avoid fatty foods.

2. **Avoid junk and fast food**:
   Fast food like pizza, burger, patties, samosa, chole bature, pastry, cookies etc. Contain very high calorific value. Therefore such foods may be avoided.

3. **Change in life style**:
   For short distance travel, we must walk more on foot instead of using rickshaw, scooter, car etc. We should use stairs in place of lifts and do more up and down in our houses.

**Q4.** Write any three steps for prevention/management of back pain.

**Ans.**
1. Proper posture while sitting is important to avoid stress on back muscle. It helps in avoiding back pain.

2. Many a times, joints of the spinal chord get disjointed while lifting heavy objects resulting in pain. At times, the lower portion of the body becomes numb, therefore one should be very careful while lifting things.

3. Deposition of unnecessary fat in the body causes obesity, which results in putting extra pressure on spinal chord and lower back. It causes back pain, so we should take appropriate diet with less fat and keep aware the obesity.
Q5. If the weight of a person is 80 Kg and height is 1.75 meter, calculate him BMI.

Ans. Weight of the body = 80 Kg

\[
\text{Height} = 1.75 \text{ M}
\]

\[
\text{BMI} = \frac{\text{Weight of the body}}{(\text{Height in Mtr})^2}
\]

\[
= \frac{80}{1.75 \times 1.75} = \frac{80}{3.0625} = 26.12 \text{ Kg/Mt}^2
\]

Q6. Classify the Asanas

Ans. 1. Dhyanatmak Asana (Meditative Asana) :

- Padmasana, Siddhasana, Swastikasana, Vajrasana, Gomukhasana etc.

These asanas should be practiced in peaceful altnospire. It increase the concentration power.

2. Relaxative Asana:

- Shashankasana, Savasana, Makar asana etc. These asanas help in relaxation of physical and mental fatique. They provide relaxation to our body and mind.

3. Corrective asana :

- Shirsasana, Sarvang asana, Shalabh asana, Bhujung asana, Mayur asana, Paschimotanasana etc.

These are very helpful in physical development. They provide efficiency to Pranayama, Pratiyahara and dharna.

5 MARKS QUESTION (LONG ANSWER QUESTION)

[I5O WORDS]

Q1. “Yoga is our cultural Hevitage.” Explain this statement.

Ans. Yoga was born out of the Thought process of thousands of years. Indians believe in cycle of birth and death and in principle of re-birth. They were
motivated to practice Yoga in order to attain Moksha. The History of yoga in as follows:

1. Pre-vedie Period: Many status in yoga mudra was found in the excavation of Harappa. It reveals that yoga was practiced during Indus Valley Civilisation which is 3000 years old.

2. Vedic-period: In Rigveda, the use of word ‘yunjate’ suggests an idea of yoga for control over senses.

3. Upanishad Period: The mention of yoga in found in puranas and upanishads also.

4. Epic-period: Ramayana and Mahabharata are important source of information about the yogic practices of that era. Bhagwat Gita emphasized on Bharti yoga and karma yoga Lord Sri Krishna narrated yoga to Arjuna in Mahabharata, “Skill in actions or efficiency alone is Yoga.”

5. Sutra Period: Patanjali wrote four yoga sutra around 147 B.C. in which he mentioned about 8 parts of yoga.

6. Smriti Period: The Literature of Smriti period shows significant presence of pranayama along with changes in beliefs, worship, ideas, rituals and customs.

7. Medieval Period: In this period two cults were very famous-Natha Cult and Bhakti Cult. Hatha Yoga was also developed during this period.

8. Modern Period: Swami Yogananda, Shri Aurobindo, Raman Maharshi etc. spread yoga outside India. Swami Vivekananda and Baba Ramdev have contributed by spreading yoga all over the world.

Q2. Describe different elements of yoga:

Ans. 1. Yama is the first element of yoga. It keeps people away from world by troubles. According to Patanjali, there are five code of conduct of yama. These are:

1. Satya: One must speak the truth. One should never cheat others.
2. **Ahimsa**: One must refrain from causing harm, violence, jealousy, hatred, anger, oppression etc.

3. **Asatya**: One must not steal others money or idea. To steal from human is to steal from God himself.

4. **Brahmacharya**: One must avoid reading sexual literature, one must keep one's mind at peace, avoid eating spicy food.

5. **Aparigraha**: One should not collect wealth and other items more than required.

2. **Niyama**: This is related with body and sense. It helps in cleansing of body. There are five Niyamas:

   1. **Saucha**: Everyday body should be cleaned externally as well as internally.
   
   2. **Santosh**: One should remain content in controlling diseases.
   
   3. **Tapa**: It trains a person to face difficulties so that one can move towards the ultimate goal.
   
   4. **Swadhyana**: One must read religious scriptures and vedas with devotion.
   
   5. **Iswara Pranidhana**: It means devoting everything to the God Almighty. We should thank God for the intelligence power, body etc.

3. **Asana**: It has third position. To keep the body in correct posture is called asana. It enhances agility and flexibility. It makes the bones and muscles strong. It protects us from various diseases. It increases life expectancy. One can work more by consuming less energy.

4. **Pranayama**: It makes the heart and lungs strong. It reduces the rate of breathing. It keeps away the respiratory diseases.

5. **Pratyahara**: This is the process of control over inner self. It helps the person to detach from external things and teaches to control over senses.

6. **Dharana**: One has to concentrate on the mind during dharana. One must concentrate on the central point of forehead, naval or peaceful light at some distance. It leads to samadhi.
7. Dhayana: A sense of radical self-awareness is called dhayana. It is attached to life each and every moment one must concentrate on God without a wavering mind.

8. Samadhi: Union of Jivatma with Paramatma is called Samadhi. Samadhi state is attained with disappearance of self-awareness. To control the impulses of mind is Samadhi. In this state, one experiences the divine happiness.

Q3. How yoga is beneficial for sports persons? Explain

Ans. 1. Yoga improves the concentration power of the player, it enhances the skill, level and performance.

2. Lungs of the player become stronger. Due to inhalation of maximum oxygen, it increases the patience.

3. The joints of the player becomes strong and flexible, which help in learning difficult skills easily.

4. It prevents the player from injury, sprain and strain.

5. It reduces the tension and pressure, resulting in strong will power to learn.

6. It increases the WBC that increases immunity power of the body.

7. It enhances the air tidal capacity, as a result the player does not feel the fatigue due to reduced rate of respiration.

8. The reaction time of the player improves considerably, it increases the efficiency and alertness.

9. It increases the physical as well as internal strength enhancing the skill in games and sport.

Q4. Discuss the methods of prevention and management of diabetes?

Ans. 1. Regular physical exercise: Regular exercise helps in reduction of sugar level in blood and helps in production of insulin in panreas.

2. Avoid oily and fatty food: Our digestive system can not absorb the fatty food properly due to high level of calorie present in it. It increases
fat in the body and people become fatty. Obesity helps in developing diabetes.

3. Maintains healthy weight: We should take proper intake of carbohydrate. BMI should be maintained between 18.5 to 24.9. In case BMI is more than 25 we would eat food with less calories.

4. Get enough sleep: Rest and proper sleep induce energy and activeness. Diabetes increases fatigue in the body. So we must get enough sleep.

5. No Tension: Tension in mind increases sugar level in the body. In order to prevent tension we should remain happy and cheerful.

Q5. Discuss the causes and management of hypertension.

Causes of hypertension:

Ans. 1. Genetic factor: It is the main cause of high BP. Its genes get transferred from one generation to another generation.

2. Obesity: It is also one of the main causes of high BP. It increases the danger by six fold.

3. Lack of exercise: Continuous lack of physical exercise increases the risk of high BP.

4. Excessive smoking, drug and consumption of alcohol: These things also increase the risk of high BP by weakening the neuro system of the body.

5. Sedentary life style: It makes the body lethargic which develops the risk of high BP.

Management of hypertension:

1. Lifestyle Changes: We should lead active life style. We should keep away from smoking and exercise for 30 minutes daily. The patient of sugar should control sugar level.

2. Control obesity: Obesity increases the risk of high BP. Obesity should be controlled by taking light food and regular exercise.
3. Meditate - It relaxes the mind and keeps us calm, thus emotions can be controlled.

4. Develop patience - Develops you patience and tolerance towards aggression

5. Take a break - Take a break and perform some other work to change emotion.
CHAPTER 5

DOPING

Introduction

Drugs are life saving as well as life threatening chemicals. They are used by sports persons for different purposes. Performance enhancing drugs are banned in sports. The reasons for the ban are mainly, the health risks of performance enhancing drugs.

Anti-doping authorities state that using performance enhancing drugs goes against the spirit of sports.

According to world anti-doping Agency (WADA) “Doping is defined as the occurrence of one or more of the anti-doping rule violations.

MEANING AND TYPES OF DOPING (Concept)

Doping is the use of prohibited substance or methods to improve sports performance. It can also be defined as use of drugs or sports performance. Doping methods or substances might harm the health of athletes and might be fatal.

Types of Doping (Classification)

(i) Performance enhancing substances.
(ii) Physical methods.
(i) Performance enhancing substance :
   (a) Stimulants
   (b) Anabolic Steroids
   (c) Peptide hormones
(d) Beta-2 Agonists
(e) Narcotics
(f) Diuretics
(g) Cannabinoids.

(ii) Blood doping and Gene doping comes under physical method.

**Blood doping**: It is the process of increasing the Red blood cells by blood transfusion. Blood doping increases hemoglobin allows higher amount of O$_2$ to fuel an athlete’s muscles. This can improve stamina and performance, particularly in long distance events.

**Gene doping**: It is the non-therapeutic use of cells, genes, genetic elements or of the modulation of gene expression, having the capacity to improve athletic performance.

Increasing muscle growth, blood production, endurance and pan resistance. In such cases nothing unusual would enter the blood stream. So officials would detect nothing in blood or wine test. Some viruses target certain organ, such as kidney, liver. Therefore only samples are taken from these area’s that could lead to detection.

**PROHIBITED SUBSTANCES AND METHODS**

Substances prohibited at all times.

(a) Stimulants
(b) Narcotics
(c) Steroids
(d) Growth hormones
(e) Beta Blockers
(f) Diuretics
(g) Blood doping

**Methods prohibited at all times or in or out of competition**

The following methods are prohibited at all times.
(a) Blood doping  
(b) Gene doping

**Responsibilities of Athletes**

(i) Remain in direct observation of the Doping Control Officer.

(ii) Produce proper photo identification

(iii) Comply with sample collection procedures.

(iv) Report immediately for test.

**ERGOGENIC AIDS AND DOPING IN SPORTS**

Ergogenics aids are any external influences that can be determined to enhance performance in sports. These includes:-

(i) Mechanical aids

(ii) Pharmacological aids

(iii) Physiological aids

(iv) Nutritional aids

(v) Psychological aids

**DOPING CONTROL PROCEDURE**

Dope test is done on athletes by World Anti Doping Agency (WADA). This agency checks and controls doping in sports. It provides technical and financial help for testing. In India, the controlling body under the WADA is named as National Anti Doping Agency (NADA).

**VERY SHORT TYPE QUESTION (30 WORDS) (CARRYING 1 MARK)**

Q1. Mention the doping substances.

**Ans.:--** The various doping substances are stimulants such as Heroin, Cocaine, Steroids such as Anabolic Steroids, Testosterone, Growth Hormone such as Somatotropin, peptide hormone.
Q2. Define doping and its types.
Ans.: Doping can be defined as the use of banned performance enhancing drugs in sports particularly by the organization that regulate sports competitions.

There are two types of Doping
(a) Performance enhancing substances
(b) Physical methods.

Q3. Explain out of competition doping test.
Ans.: Out of competition doping test is any such testing of an athlete not in competition or in a way associated with athlete's immediate participation in an event.

Q4. What do you mean by WADA
Ans.: WADA stands for world anti doping agency.

Q5. Define Blood doping?
Ans.: Blood doping is a method of improving athletic performance by artificially boosting the blood's ability to bring oxygen to the muscles. Blood doping increases the amount of hemoglobin in the blood stream.

SHORT TYPES QUESTIONS (60 WORDS)
(CARRYING 3 MARKS)

Q1. Explain the use of stimulants and steroids in sports.
Ans.: Stimulants increase the heart rate and palpititation. These drugs improve work output ability by reducing the feeling of fatigue. They tend to increase alertness and physical activity. It increases the heart rate and reduces the reaction time. Examples of these are caffeine, amphetamines. They are used to increase endurance and speed.

Steroids are very strong chemicals which are used by the players during training period. They increase the heart rate, body weight, muscle mass and blood circulation. They promote growth and healing process. By increasing muscle size and strength, athletes enhance the performance in sports. Steroids are either taken orally or by intra muscular injection.
Q2. Write down the harmful effects of prohibited substances?

Ans.:-
Prohibited substances are those substances which are banned or prohibited from use in sports. There are some substances which are banned or prohibited only during competition. A substance is added to the list of prohibited substances if it enhances the sports performance or damages the health of the athlete. For exemption it must be verified by the physician. In order to be accepted the following points must be true:

(a) The athlete would face vital health problems if he does not take such drug.

(b) There is no other suitable alternative to that drug.

(c) There is no considerable performance enhancing benefits.

Q3. Discuss the effects of blood doping.

Ans.:-
Blood doping is the process of increasing the Red Blood cells by administration of blood transfusion. Increased amount of RBCs helps in strength and endurance activities. This can be done by injecting extra RBCs production. Blood doping increases the amount of hemoglobin in the blood stream. Hemoglobin is an oxygen carrying protein in the blood. So increase in hemoglobin allows higher amount of oxygen to reach and fuel an athlete's muscles, which increases stamina and performance particularly in long distance events such as running and cycling.

Q4. Enlist the responsibilities of athlete for Doping.

Ans.:-
An athlete can be called for drug test at any time. In competition or out of competition. During competition, drug test is done on winning team/teams. Other athletes can be tested by random selection from all competitors.

The responsibilities of athlete are:

(i) Remain in direct observation of the Doping Control Officer until the completion of sample collection procedure.

(ii) Produce appropriate photo identification.

(iii) Comply with sample collection procedures.

(iv) Report immediately for test, unless there is valid reason for a delay.
It educates athletes regarding harmful effects of drugs. WADA also provides the list of banned or prohibited substances in sports. In India the controlling body under the WADA is named as National Anti Doping Agency (NADA).

Q5. Write short note on Ergogenic aids.

Ans.:– Ergogenic aids are the external influences that can be determined to enhance performance in sports. These includes mechanical aids, pharmacological aids, physiological aids, nutritional aids and psychological aids.

(i) Mechanical aids: It includes altitude training, Aqua training, uphill and downhill running, treadmills, weight training, clothing, Footwear, equipments etc. These are valid Ergonomic aids.

(ii) Pharmacological aids: It includes anabolic steroid, Beta Blocker, Caffeine, protein supplements, Sodium bicarbonate. These are banned by IOC in sports.

(iii) Physiological aids: It is like Acupuncture, Blood doping, creatine, Herbal medicines, Human Growth harmones, physiotherapy, sports massage, sauna etc. Many of these are banned by IOC in sports.

(iv) Nutritional aids: They are like Bicarbonate of soda, caffeine, creative, sports drinks. Many of these are banned by IOC in sports.

(v) Psychological Aids: These includes meditation, motivation, cheering, Relaxation. Most of these are valid and applicable in sports.

LONG TYPES QUESTION (ISO WORDS)
(CARRYING 5 MARKS)

Q.1 Describe the ill effects of stimulants, steroids, Narcotics and Diuretics.

Ans.:– The ill effects of the banned drugs are as follows:-

(i) Stimulants: These are chemicals which have direct effect over Central nervous and Cardiovascular Systems. The toxic effects of stimulants are aggression, violent behaviour, blurred vision, dizziness, irregular heartbeat etc. It has addictive effect, moreover its dependence can lead to high dosage.
(ii) **Steroids**: They adversely affect the body leading to heart attack, cause cancer, infertility (in females), hypertension, aggressive behaviour, uncontrolled emotions etc.

(iii) **Narcotics**: It may cause loss of balance and co-ordination. They cause loss of concentration. There may be drowsiness, nausea, vomiting, constipation, fainting and coma etc. They create illusion of athletic powers beyond actual capacity. They are good pain killers. Examples of these are morphin (Ganja), Opium, heroin, Cocaine etc. they are found in cough syrups.

(iv) **Diuretics**: These drugs reduce fluid from the body. The person reduces body weight in very short period. These are generally used by wrestlers, judo and boxing players. These drugs increase urine secretion. It reduces the natural appetite, may lead to malnutrition, body fainting, dehydration etc. The amount of potassium and sodium decreases in the body, which may lead to mineral imbalance in the body.

Q2. How does an individual, health get affected by the ill effects of Doping?

**Ans.**:- The use of performance enhancing substances leads to serious health problems and even death.

(a) **Addictive effects**: Most of these substances have addictive effects and hence it creates physical and psychological effects.

(b) **Cardiac Problems**: Doping has adverse effect over heart and causes many types of cardiac problems like varied heart beat, hypertension, cardiac arrest etc.

(c) **Affects Kidney and liver**: Doping substances contains strong chemicals and hence it affects liver and kidney adversely. It leads to non-functioning and partial damage of important organs.

(d) **Unbalanced Psychological Behaviour**: These substances usually leads to un-balanced psychological behaviour like aggression, loss of concentration, headache, loss of neuromuscular responses, insomnia, depression etc.

(e) **Impotence**: Doping causes impotence in males i.e. shrinking of testicles, reduction of sperm production. In females it causes infertility.
(f) **Dehydration**: Doping causes great loss of water from body, thus leads to dehydration. Dehydration results in cramps, heat stroke, high temperature etc.

(g) **Digestive problems**: Most of these banned drugs cause digestive or gastro problems like loss of appetite, hormonal variation, constipation, stomach ache etc.

**Q3. Describe the doping test procedure.**

**Ans.**:- Doping test is a technical analysis of specimens of urine, blood, sweat, saliva or oral fluid to determine the presence of specified drugs or their metabolism. An athlete can be called for drug test at any time, usually drug test is done on winning team or top three competitors.

**Testing procedure** : During the drug test, samples of urine, blood, saliva is take. These collected samples are split into two parts (sample A and sample B) and sealed by athlete. The first sample (Sample A) is sent is registered laboratory for drug test. If the first sample (Sample A) found positive or sports enhancing drugs are found in this sample, then the athlete is notified.

After words second sample (Sample B) is tested in the presence of athlete or coach.

If both the samples (sample A and sample B) are positive then relevant sports federation is notified. It is the responsibility of concerned federation to decide the penalties or ban to be imposed over that athlete.

Through this dope test, it educates athletes regarding harmful effects of drugs. It also checks the quality of athletics related to doping or drug use in sports.

**Q4. Explain the performance enhancing substance in detail.**

**Ans.**:- The performance enhancing substances are as follows:

The use of drugs to enhance performance is considered unfair and puts the health of athlete at high risk like

(a) **Mechanical aids**: - It includes altitude training, aqua training, elastic cord, treadmills, vibration training, weight training etc.
(b) **Pharmacological aids** :- It includes Anabolic steriod, beta blockers, caffeine, choline, sodium bicarbonate. These are all banned by IOC in sports.

(c) **Physiological aids** :- It includes Herbal medicines, sports massage, sauna, Human Growth hormones.

(d) **Nutritional aids** :- They are like Bicarbonate of soda, carbohydrate loading, creatine, sports drinks.

(e) **Psychological aids** :- These includes mediation, motivation, centering, cheering, Relaxation. Most of these are valid and applicable in sports.

**Q5. What do you mean by physical methods? Explain the methods prohibited in the field of sports?**

**Ans.:-** Physical Methods include blood doping, Gene doping.

**Blood doping** : It is an illicit method of improving athletic performance by artificially boosting the blood ability to bring more oxygen to muscles. Blood doping increases the amount of hemoglobin in the blood stream. Since hemoglobin is an oxygen carrying protein in the blood. So increasing hemoglobin allows high amount of oxygen to reach and fuel in an athlete’s muscles.

**Gene doping** : It is the non-therapeutic use of cells. Or the modulation of gene expression, having the capacity to improve athletic performance. Increased muscle growth, blood production, endurance, oxygen disposal and pain resistance. In such cases nothing unusual would enter the blood stream. The new gene may be identical to the natural gene and may not be in every cell of the body. Some viruses are present in certain organs such as kidney, liver thus only samples taken from these are as can lead to detection.

**Prohibited Substances and Methods** : Prohibited substances and methods are those substances which are banned or prohibited from use in sports. A substance or method is added to the list of prohibited substances and methods if it enhances the sports performances or damages the health of the athlete. In case any athlete takes such substance for therapeutic use he will have to apply to the International federation for exemption.
CHAPTER 6

PHYSICAL ACTIVITY ENVIRONMENT

Introduction to physical activity:

Healthy environment is the foundation of good health as it is safe, sports environment promotes and helps to develop good health. Sports environment encourages everyone to perform physical activity with full enthusiasm. In modern times the importance of physical activity has been realised and many organisations are working to promote and develop sports environment. Sports environment has balanced form of natural and manmade environment. Every human being is a social animal. Man cannot live without society, thus healthy society is the need of every human being.

Concept of sports environment:

Sports environment re-energises us with full of enthusiasm and creativity. It plays an important role in child development. Sports environment is the base of healthy and positive environment. Sports environment is a need of society. Sports environment should have proper playfield with all safety means, preventive guards, training.

Need of sports environment:

Sports environment is considered as healthy and positive environment. It plays important role in child growth and development. Sports environment is safe, clean and healthy. Environment plays an important role in the quality of an athletic performance. Environment factor’s include exposure to extreme heat, cold, humidity, range of participants, enhancing the clarity of communication.
**Essential Elements of positive sports environment**

Sports environment requires three essential elements:

(a) Infrastructural setup  
(b) Equipment facilities and its maintenance  
(c) Players, expert staff and its organisation

**(a) Infrastructural Set up:**

The infrastructural setup for sports environment must be properly planned. The purpose and need of setting up must be clear like for, what activities to be played, how much area required for those activities, site or location of infrastructure etc.

**(b) Equipment facilities and maintenance:**

In sports environment, playing equipments should be of very good quality and according to game rules. Players should wear proper sports kit and proper sports shoes. The playing arena should be well protected from children. There should be safe provision of drinking water, washrooms, changing rooms. There should be emergency exit point along with first aid facility. There should be safe provision of drinking water, washrooms.

**(c) Players, Expert staff and its organisation:**

Players should be guided and given proper training. They should be imparted knowledge related to physical education or health edu. and first aid. The players should be trained with proper training methods. Considering the principles of training in a progressive manner.

**Principles of physical activity environment**

(a) Construction as per laws.

(b) Identify and Analyse the risk of harm

(c) Safety policy

(d) Code of conduct for users

(e) Suitable staff and volunteers

(f) Promote participation
(g) Support, Train, Supervise and Enhance performance
(h) Respond to Suspected Abuse and Neglect
(i) Proper Maintenance
(j) Hygienic safe and cleanliness of physical activity environment.

Components of Health related fitness

Good health makes the person to live the most and serve the best. Health related fitness has various components which are as follows.

(a) Regular physical activity.
(b) Nutritious food and balanced diet
(c) Active Schedule
(d) Proper Immunization and medical care
(e) Prevention and treatment from diseases
(f) Hygienic habits and safety principles
(g) Away from health hazards.
(h) Good social life.

Behaviour change technique for physical activity

Behaviour change technique is a theory based method for changing psychological determinants of behaviour like attitude. The benefits of engaging in regular exercise are known to everybody. Despite knowledge of the advantages associated with engaging in regular activity, most people do not take sufficient exercise.

Common behavior changes are given :-

(a) **Setting Goals for Exercise** : Setting proper goal for improving our health should be the topmost priority of ours.

(b) **Making life style change a priority** : It is difficult for most of them to make last minute changes in our lifestyle technique. We must always remain focused for the plans we have set in.
(c) **Cognitive behavioural strategies**: Many people focus on negative self statements, justifications for exercise, limited self control and unrealistic exercise goals. The goal of these strategies is to alter unhelpful moods, negative evaluations. Unrealistic standards that affects exercise patterns.

(d) **Self efficacy**: Self efficacy is defined as the belief in one’s capabilities to organize and execute the courses of action needed to produce given attainments.

(e) **Keeping track of exercises**: This involves recording and observing all exercise behaviours and monitoring it. Self monitoring is used to raise awareness of behaviour patterns and identify faulty activity patterns. It can be used when you want to improve your efforts.

**Exercise Guidelines at different stages of growth**

Development is a never ending process whereas growth refers to an increase caused by physiological change, in which the child becomes bigger in size and weight. As every individual is unique in himself individual differences and specificity of activity should be considered.

Different stages of growth are as follows:-

**Infancy activity (0 to 3 yrs)**

In this stage, the growth pattern involves control over big muscles. Clean, safe and hygienic environment is the need in this stage. In this tender age the activities have to be done under the observation of parents and guardians.

**Early childhood activities (3 to 8 yrs)**

During this stage of growth the pattern involves control over small muscles and bone development. The environment needs at this stage should be clean and safe, moreover proper check by parents and teachers are required.

**Later childhood activities (8 to 12 yrs)**

During the stage, flexibility and co-ordinated patterns of growth occurs. During this stage of growth good quality apparatus and safety measures should be considered. Wrong habits should be checked.
Adult hood activities (19 yrs onwards)

In this stage, high vigorous activities are preferred. Adventure sports gives good thrill in this stage. Good sports environment is required in adult hood.

**VERY SHORT QUESTION**
(CARRYING ONE MARK OF 30 WORDS)

Q1. Define sports Environment.

**Ans.**:- Sports Environment is the conditions and circumstances in which sports persons perform or indulge in sports activities. Sports persons including the related persons to sports such as coaches, teachers of physical education and other officials must know and pay proper attention to sports environment. It means that all the factors or conditions that encourage and promote sports constitutes sports environment.

Q2. What do you mean by proper or positive sports environment?

**Ans.**:- For the promotion and encouragement of sports and games appropriate sports environment is always required. Sports and games cannot be ameliorated and flourished in the absence of appropriate sports environment. If it is appropriate it will grow like anything on the other hand if environment is not positive its growth and development will be hindered and sports persons can never prosper in the field of games and sports.

Q3. Mention the components of Health related fitness.

**Ans.**:- The various components of Health related fitness are as under :-

- (a) Regular physical activity
- (b) Nutritious food and Balanced diet
- (c) Active schedule
- (d) Proper Immunization and medical care
- (e) Prevention and treatment from Diseases
- (f) Hygienic Habits.
(g) Away from health hazards.
(h) Good social life.

Q4. What activities are recommended for early childhood?

Ans.: The activities recommended for early childhood should be with low energy level, but involving light running, catching, throwing, jumping, co-ordinative exercises, flexibility exercises. Enjoyable and recreative methods should be adopted to make the activities more child based learning. The environment needed at this stage should be clean and safe and moreover proper check by parents and teachers are very much required.

Q5. What activities should be performed by an Adult?

Ans.: In this stage highly rigorous activities are preferred. These in turn develops good strength, endurance and speed abilities. At this stage more of adventurous sports and combative sports gives more thrill. Weight training develops good strength among adults. Good sports environment is of utmost need in adulthood.

SHORT TYPE QUESTIONS
(CARRYING 3 MARKS OF 60 WORDS)

Q1. Why there is a need of sports environment?

Ans.: Environmental education plays an important role in physical education and sports. The education system should be made such that the environment and sports are understood to be in close ties with each other sports gathers under its umbrella millions of people worldwide through its clubs, associations and other clubs etc. in which activities performed must be carefully analysed. Environment plays an important role in the quality of an athlete’s performance. There are many things the athlete can do or adapt himself according to expected or unexpected environment.

Q2. Explain the infrastructural setup for positive sports environment?

Ans.: The infrastructural setup for sports environment must be properly planned. The architectural design of infrastructure should focus on the following factors like purpose and need of setting up must be made clear, for what activities to be played, site or location of infrastructure, natural or other
Q3. Discuss the importance of training equipments and maintenance for developing positive sports Environment.

Ans.:-
In sports environment the training equipment or rather playing equipments should be of good quality. And according to games rules. These should be properly handled and should be placed properly as per rules. The playing arena should be well maintained, marked properly, regularly cleaned up and safe for performing activity. There should be safe provision of drinking water, washrooms, changing rooms etc. There should be proper provision of emergency exit point along with proper first aid facility. Players should also be guided and given proper training. They should be given knowledge related to physical education or health education or first aid. The staff must also be well qualified with good experience in related fields. They should handle the needs of the players with full sincerity and safety to improve their performance in sports. The players should be trained with proper training methods considering the principles of training in a progressive manner.

Q4. What activities are recommended for later childhood stage?

Ans.:-
In this stage, flexibility and co-ordinated patterns of growth occur and the activities should involve light activities with co-ordinative and flexibility exercises. They should develop bone joints and muscular co-ordination. The activities recommended by experts at this stage are the yogic asanas, gymnastic exercises, ball games, running activities, calisthenic exercises, rhythmic exercises, anaerobic activities, balancing exercises etc. During this stage of growth good quality apparatus and safety measures should be considered. Teachers should check their mistakes and correct them instead of making it a very big deal. Wrong habits should be checked and guided properly for creativity and proper understanding.

Q5. Discuss the activities for Adolescence stage or for the Teenager?

Ans.:-
In this stage, the muscular strength, endurance and speed develops along with growth patterns. The activities should involve moderate to high energy activities. All games and sports are recommended in this stage.
Aerobic activities are preferred. Team games are also preferred to develop togetherness and team co-ordination. High aggression and violence should be avoided and discouraged, moreover good affection, good leadership and good training methods are the needs of adolescence activities.

**LONG ANSWER TYPE QUESTIONS (150 WORDS)**

**CARRYING 5 MARKS**

**Q1.** Discuss the essential elements of positive sports Environment.

**Ans.:-** Basic essential elements of positive sports environment are of utmost importance, which are as follows:

(a) **Infra structural setup :-**

The architectural design of infrastructure should consider the following factors such as purpose and need of setting up must be made clear, how much area required for those activities, natural or other sources available, industrial pollution, facilities to be provided for players or spectators, Spectators Sitting Capacity, finances or funds available.

(b) **Facilities and its maintenance :-**

In sports environment the playing equipments should be of very good standard. The playing area should be well maintained, marked properly, regularly cleaned up and safe for performing activity. There should be safe provision of drinking water, washrooms, changing rooms etc. There should be provision of emergency exit point along with proper first aid facility.

(c) **Players, Expert Staff and organisation :-**

Sports environment is meant for players. Players should also be guided and given proper training. The staff must be well qualified with good experience in related fields. There should be proper administration and organisation among staff members. Players should be inculcated towards good habits, moral values, sports ethics, sportsman qualities etc. In sports environment we should also encourage people who provide help or promote and help to improve sports environment.
Q2. Explain the principles of physical activity environment.

Ans.: The principles of physical activity environment should be constructed as per laws. They must follow the laws and guidelines:

(a) **Safety policy**: The management should develop clear and accessible child safety policy.

(b) **Construction as per laws**: The physical activity environment must follow the laws and guidelines of the government.

(c) **Proper maintenance**: The organisation should check and maintain the infrastructure and organisation of physical activity environment.

(d) **Code of conduct for users**: The organisation that specifies and standards of conduct and care given to its users.

(e) **Identify and Analyse the Risk of Harm**: The management should identify and analyse the possible risk factors and protect them from children.

(f) **Suitable staff and volunteers**: The organisation should check and maintain the infrastructure and organisation of physical activity environment.

Q3. Discuss the essential elements of positive sports Environment.

Ans.: For positive sports environments, we have various elements for better result in sports. Positive sports environment consists of the following essential elements.

(a) **Sports Stadiums or Sports Complexes**:

Sports stadiums or sports complexes should be well planned. Stadiums should be constructed according to the requirement. The site of the stadium must be free from air pollution. There must be proper provision of safe drinking water, urinals, toilets and sufficient space for parking vehicles.

(b) **Sports attitude**:

The most important element for a positive sports environment is sports attitude. It becomes the duty of the sports teachers, coaches...
or trainers to make the athletes and players mentally ready to play. Participation in physical activities helps to develop the individual physical activities helps to develop the individual physically and mentally. People should have positive attitude towards sports activities. Sense of oneness, team work, sense of co-operation, sportsmanship through games and sports.

(c) **Drugs, tobacco and Alcohol free Environment:**

The coaches, parents, spectators, players and other officials should refrain from drugs, alcohol and tobacco. They should try to promote positive sports environment by refraining themselves from such substances.

(d) **Normal climatic conditions** :-

There should be normal climatic conditions for positive sports environment. Practicing in extreme heat and cold conditions may cause the heat stroke, heat cramps, heat exhaustion, frost brite etc. So the sports persons should practice in normal climatic conditions.

(e) **Education related to sports** :-

Sports education should be compulsory to create a positive sports environment to create a positive sports environment. Knowledge about different types of tournaments, rules and regulations and their importance in society motivates the people towards sports. So sports related education is an essential element of positive sports environment.
CHAPTER 7

TEST AND MEASUREMENT IN SPORTS

CLASS XI (UNIT VII)

TEST-

A Test is a tool which is used to evaluate the skills, performance and reliability of the task completed by a sportsperson.

MEASUREMENT-

Measurement is about the collection of data about performance or task completed by a sportsperson by using a test.

IMPORTANCE OF TEST AND MEASUREMENT-

1. To frame the objectives
2. To evaluate the learners.
3. To evaluate the teaching programme.
4. To know the capacities and abilities.
5. To discover the needs of the participants.

BODY MASS INDEX (B.M.I.) -

It is the value derived from the mass (weight) and height of an individual.
FORMULA FOR CALCULATING B.M.I. -

\[
\text{Body Mass Index} = \frac{\text{Weight in kg}}{\text{Height in m}^2}
\]

WAIST HIP RATIO -

Waist Hip Ratio is the ratio of the circumference of waist to that of the hips.

FORMULA FOR CALCULATING WAIST HIP RATIO -

\[
\text{Waist Hip Ratio} = \frac{\text{Waist Circumference}}{\text{Hip Circumference}}
\]

SOMATOTYPES(ENDORPH, MESOMORPH, ECTOMORPH)

Somato Types means human body shape and physique type.

According to W.H. Sheldon, human beings can be classified into three extreme body types i.e.

1. **Endomorphy**-
   
   People with endomorph body structure have rounded physique, their excessive mass hinders their ability to compete in sports. Suitable games - weight lifting and power lifting.

2. **MESOMORPHY**-
   
   People with mesomorph body structure have thick bones and muscles with rectangular shaped body. They have larger and broader chest and shoulders and can be top sports person in any sport.

3. **ECTOMORPHY**-
   
   These are slim person because their muscle and limbs are elongated. They have flat chest and have less muscle mass. They have less strength but dominate endurance sports.

PROCEDURES OF ANTHROPOMETRIC MEASUREMENT

(HEIGHT, WEIGHT, ARM AND ARM LENGTH & SKINFOLD)

Meaning of Anthropometric measurement -
Anthropometric measurements means measurements of height, weight, arm, leg length, waist circumference and skin folds etc

**HEIGHT-**

Height of an individual must be measured using a stadiometer to the nearest half of a centimeter.

**Weight-** Correct weighing machine should be used and measurement must be recorded to the nearest 0.1 k.g.

**Arm length-** Measurement should be done from the bony tip of the shoulder to the tip of the little finger.

**Upper arm length-**

To measure the upper length the arm should be bent 90 degree at the elbow with palm facing upwards.

**Leg length-** It can be measured by using a flexible steel tape from the outside edge of centre of the foot to the upper edge of the greater trochanter.

**Upper leg length-** Bend the knee at 90 degree angle & sit up straight. Measure the upper leg length from inguinal crease to the proximal border of patella to the nearest of 0.1 centimeter.

**SKIN FOLD MEASUREMENTS-**

Arms (triceps) skin fold

Sub scapula skin fold

Suprailiaskin fold

Abdomen skin fold

Thigh skin fold

**A. SHORT ANSWER TYPE QUESTIONS(I MARK EACH)**

Q1. What do you mean by a test?

**Answer:** A Test is a tool which is used to evaluate the quality, performance and reliability of the task completed by a person.
Q2. What do you mean by Measurement?

Answer: Measurement is about collection of data and information about certain skills or levels of fitness of an individual by using tests and relevant techniques.

Q3. Define Test.

Answer: A test is a tool which is used to evaluate the skill, knowledge, capacities or aptitudes of an individual or a group.

Q4. Define Measurement.

Answer: Measurement is the process of administrating a test to obtain a quantitative data.

Q5. Write the formula to calculate the B.M.I.

Answer: B.M.I. = \( \frac{\text{Weight in kg}}{\text{Height in m}^2} \)

Q6. What do you mean by somato types?

Answer: Somato types basically means body types which is further classified into three types i.e. Endomorph, Mesomorph and Ectomorph.

Q7. What do you mean by waist hip ratio?

Answer: Measurement of waist circumference divided by hip circumference is called waist hip ratio.

Q8. Write the formula to calculate the waist hip ratio.

Answer: waist circumference = \( \frac{\text{Waist Circumference}}{\text{Hip Circumference}} \)

Q9. State the uses of Anthropometric measurements.

Answer: Anthropometric Measurements of height, weight, arm and leg length, waist circumference and skin fold etc. are significant indicators of health which enable us to know the physical growth and development and health problems of an individual.
Q1. Explain the procedure of measuring somatotypes in brief.

Answer: Somatotypes means human body shape, and physique types. Somatotypes helps the physical education and sports teachers to classify the students for particular sports and games on the basis of physical, mental, and practical aspects.

The procedure of measuring somatotypes is based on the classification by W.H. Sheldon-

1. Endomorphy-
   Such individuals have short arms and legs and rounded physique. The upper parts of arms and legs are significantly thicker than the lower parts. Their excessive mass hinders their ability to compete in sports.

2. Mesomorphy-
   Such individuals have balanced body compositions and athletic physique. They are able to increase their muscle size quickly and easily and have rectangular shaped body. Their chest and shoulders are broader in comparison to their waist line.

3. Ectomorphy-
   These individuals are generally slim because their muscles and limbs are elongated. As they have weak constitution of body and usually face difficulties in gaining weight. Their light body constitution makes them suited for aerobic activities like gymnastics.

Q2. Discuss the procedure of measurement of arm length and upper arm length.

Answer: Procedure of measurement of arm length -

The subject must stand with his arms hanging by the side of his body with his fingers outstretched. A measurement is made from the acromial i.e. the bony tip of the shoulder to the tip of the little finger.
Procedure of measurement of upper arm length -  

The subject must stand upright with body weight distributed equally on both the feet. The right arm should be bent at 90 degree from the elbow with palm facing upwards. A measurement is made from acromial to the bony part of the mid elbow. Measurement must be taken to the nearest 0.1 cm and recorded.

Q3. Elaborate the procedure of measurement of leg length and upper leg length.

Answer: Leg length -  

The leg length of a child or adult is measured with a flexible tape from the bottom to the upper edge of greater trochanter.

Upper leg length -  

The subject is made to sit on a box with one of the knee bent at 90 degree angle with his back upstraight. Measure the upper leg length from the inguinal crease to proximal border of patella. Record the measurement to the nearest 0.1 cm.

Q4. Calculate the BMI of a male person whose weight is 80 kg and height is 1.6 m. Also state the category in which he falls.

Answer:  

\[ \text{BMI} = \frac{\text{Weight in kg}}{\text{Height in m}^2} \]

\[ \text{BMI} = \frac{80}{1.6 \times 1.6} = \frac{80 \times 100}{16 \times 16} \]

\[ \text{BMI} = 31.25 \text{ kg/m} \]

The above person falls in class - I category.

Q5. What do you mean by BMI? Write down the scale of BMI.

Answer: BMI is a statistical measurement that let us know whether the person is under weight, normal weight or over weight.
BMI is categorized as below -

<table>
<thead>
<tr>
<th>Category</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
</tr>
<tr>
<td>Normal weight</td>
<td>18.5 - 24.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 - 29.9</td>
</tr>
<tr>
<td>Obesity class I</td>
<td>30.0 - 34.9</td>
</tr>
<tr>
<td>Obesity class II</td>
<td>35.0 - 39.9</td>
</tr>
<tr>
<td>Obesity class III</td>
<td>&gt; 40.0</td>
</tr>
</tbody>
</table>

Q6. Explain in brief the procedure of Anthropometric measurement of weight?

Answer: The scale should be placed on hard floor surface so that the beam gets into balanced position.

Procedure for weight measurement -

1. The subject must wear light clothes.
2. He should stand in the centre of the platform of the weighing machine with his body weight equally distributed on both the feet.
3. Read the measurement in front of the needle and record it to the nearest 0.1kg.

Q7. Explain in brief the procedure of Anthropometric measurement of height?

Answer: The child or adult should remove socks, shoes, jackets or any other heavy clothing. The floor surface should be plane and hard. The height should be measured using a stadiometer.

Procedure for height measurement -

1. The subject should stand with his feet flat and together on the floor. Arms should be by the sides and knees and back should be straight. The back of head, buttocks, calves, heels and shoulder blades should touch the measuring surface.
2. After that the horizontal sliding part of the stadiometer is lowered gently so that hairs get pressed flat and subject should be asked to stand still.

3. Height of the subject should be read to the nearest half in centimeter and recorded.

**LONG ANSWER TYPE QUESTIONS**

(5 MARKS EACH) [150 WORDS]

Q1. Explain in detail the importance of Test and Measurement in the field of sports.

**Answer:** In a physical education and sports programme it is important to select a target. If a person desires to improve himself in different aspects of fitness he will have to undergo fitness programmes. Test and Measurement in physical education are the devices that are needed to collect the details regarding the needs, abilities and attitudes of a sports person.

A test is basically a situational presentation where specific responses are collected from the subject. These responses are measured both qualitatively and quantitatively. Measurement is about collection of data of performance or task completed by a sports person by using test and scientific techniques.

Test and Measurement is an important feature in the field of physical education and sports.

The following points indicate the importance of Test and Measurement in the field of sports:

1. To frame the objectives -
   Test and Measurement helps in setting the target or goal according to the need and requirement. By adopting the Test and Measurement techniques the physical education teachers gets an accurate idea about the progress made by the students.

2. To evaluate the learners -
   In the field of physical education and sports Test and Measurement helps in collection of data which further helps in evaluating the learners ability
separately. It also helps the sports person in enhancing his sports performance.

3. To evaluate teaching programme -

Test and Measurement is a scientific tool which helps the teacher to adopt correct methodology upon the sportsman so that desired results may be achieved.

4. To know capacities and capabilities -

Through Test and Measurement the teachers get aware of the ability and capacities of the students which provides a platform in preparation of fitness programme.

5. To discover the needs and requirements of the participants -

Needs of the participants are correctly assessed by the scientific approach of Test and Measurement. It helps in knowing where more emphasis is needed so that target may be achieved.

Q2. Explain the procedure for fixing marks for skinfold measurements.

**Answer:** The marking of skinfold measurements should be proper for taking accurate anthropometric measurements. So, for proper marking of skinfold measurements the following procedures should be taken into consideration.

1. **Triceps skinfold =**

   The child or adult must stand up straight with arms relaxed. With the help of a measuring tape mark a point with a pen at the centre of triceps. This is the point or mark from where the skinfold measurement should be done with the help of a skinfold caliper.

2. **Sub scapula skinfold -**

   Find out the exact location of scapula. The skin fold area is just below the inferior angle of scapula. Skin fold measurement should be done with the help of skin fold calipers.
3. Suprailiac skinfold -

The intersection of a line joining the spinal and front part of armpit and horizontal line at the level of iliac crest can be marked for skinfold measurement.

4. Abdomen skinfold -

The abdomen muscles of the subject must be relaxed. He may be asked to hold the breath if any movement interferes the process of measurement.

A point should be marked 3 cm to the right and 1 cm below the midpoint of umbilicus.

5. Thigh skinfold —

The child or adult whose measurement is to be taken must sit on a chair with his back completely straight. Now mark a point exactly between the knee cap and the inguinal crease on the thigh for skinfold measurement.

Q3. Explain the procedure of skinfold measurements in detail.

Answer: Skinfold measurements are also called as “fatfold thickness”. These measurements provide the information or data of the thickness of double folds of the skin and subcutaneous adipose tissue at specific sites of the body. In simple words skinfold provides the information about general fatness of the body.

The procedure of skinfold measurements is as under-

1. Triceps Skinfold -

The arm of the subject or child should be hung loosely. Stand behind the subject and pull the vertical skinfold about 1/2 inch from the spot already marked. Keep the skinfold caliper perpendicular to the length of the fold centering the mark. Record the measurement to the nearest millimeter.

2. Sub scapula skinfold-

After locating the marked point on the sub scapular region, pull a skin fold for about 34 inch above and keep the skin fold caliper perpendicular to the length of skinfold. Release the caliper and note the measurement to the nearest millimeter.
3. Suprailliac skinfold-

The subject should stand straight with his feet together and arms relaxed. Pull a skinfold 34 inch above the marked point with the thumb and index finger. The skinfold caliper should be kept perpendicular to the length of skin fold. Release the caliper and note the reading on the dial to the nearest of millimeter and record it.

4. Abdomen skinfold -

After locating the already marked point, pull a horizontal skinfold to about 34 inch. Place the skinfold caliper perpendicular to the length of skinfold. Release the caliper and note the reading to the nearest of millimeter and record it.

5. Thigh skinfold —

The person is made to stand with his weight on the left leg and right leg forward with knee slightly bent. Grip a skinfold on the already marked area on the mid thigh. Place the skinfold caliper and note the reading to the nearest of millimeter and record it.
CHAPTER 8

FUNDAMENTALS OF ANATOMY AND PHYSIOLOGY

INTRODUCTION

ANATOMY

Anatomy is the study of the structure of human body.

PHYSIOLOGY

Physiology is the study of functions of human body.

MAIN SYSTEMS OF HUMAN BODY

i. Skeletal System
ii. Muscular System
iii. Digestive System
iv. Respiratory System
v. Nervous System
vi. Glandular System
vii. Excretory system
viii. Reproductive System

IMPORTANCE OF ANATOMY AND PHYSIOLOGY

1. Helps in physical fitness.
2. Provides knowledge about body structure.
4. Protects from sports injuries.
5. Helps in the process of rehabilitation.
6. Helps in maintaining healthy body.
7. Helps to know about individual differences.

SKELETAL SYSTEM AND ITS FUNCTIONS

SKELETAL SYSTEM

The skeletal system is the bony framework of our body.

FUNCTIONS OF SKELETAL SYSTEM

1. It provides support to the body.
2. It gives shape and structure to the body.
3. It provides protection to the vital organs of the body.
4. It acts as lever.
5. It acts as storehouse of minerals.
6. It acts as production house of RBCs.
7. It acts as junction or attachment to skeletal muscle.
8. It works as self repair system.

CLASSIFICATION OF BONES

1. Long bones
2. Short bones
3. Flat bones
4. Sesamoid bones
5. Irregular bones
6. Sutural bones

**TYPES OF JOINTS**

1. Immovable or fibrous joints
2. Slightly movable or cartilaginous joints
3. Freely movable or synovial joints
   a. Hinge joint
   b. Pivot joint
   c. Ball and socket joint
   d. Saddle joint
   e. Gliding joint

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**MUSCULAR SYSTEM**

**PROPERTIES OF MUSCLE**

- Muscles are the moving force behind our movements.
- Muscles are attached to the bones of the skeleton.
- Muscles give rounded shape to the body.
- Muscles help in the protection of organs with the bones.
- Human body contains more than 650 individual muscles.
- The muscles contribute about 40% of our body weight.

**TYPES OF MUSCLES**

1. Voluntary/skeletal/striated muscle
2. Involuntary or smooth or spindle muscle
3. Cardiac muscle
FUNCTION OF MUSCLE

1. Gives shape and structure to the body.
2. Provides protection to the body.
3. Helps in fluid movement
4. Provides effort (of lever)

STRUCTURE OF MUSCLE

A muscle fiber is made up of myofibrils. Each myofibril consists of protein molecules called actin and myosin.

RESPIRATORY SYSTEM

RESPIRATION

Respiration is a physical process by which living organism take in oxygen from the surrounding and give out carbon dioxide.

FUNCTIONS OF RESPIRATORY SYSTEM

1. To exchange oxygen and carbon dioxide between the air and blood.
2. To produce sound.
3. To regulate blood Ph.
4. To protect against some micro organism.

TYPES OF RESPIRATION

1. External respiration
2. Internal respiration

MECHANISM OF RESPIRATION

It involves nose, nostrils, lungs, blood and cell through which oxygen and carbon dioxide are exchanged and energy is produced in the body.
CIRCULATORY SYSTEM

The transport of material between various parts of body is called circulatory system. It consists of heart, blood vessels, arteries, arterioles, capillaries, veins, venules and fluid.

STRUCTURE OF HEART

Heart is fist shaped. It consists of four chambers which collect impure/deoxygenated blood from different parts of body and after purification/oxygenation it supplies pure/oxygenated blood to different parts of body through blood vessels.

BLOOD

Blood is a special kind of fluid which acts as a medium of transporting nutrients and gases from one part of body to another.

HEART RATE

It is the number of pumping of heart in one minute.

STROKE VOLUME

It is the volume of blood pumped out by heart in one beat. It is approximately 80 ml/beat in normal adult, whereas trained players have 110 ml/beat as stroke volume.

CARDIAC OUTPUT

Cardiac Output = stroke volume x heart rate. It is 5 to 6 litres at basal level.

BLOOD PRESSURE

It is the force exerted by the blood on the walls of blood vessels.

SECOND WIND

The breathlessness caused due to prolonged exercise is removed automatically by our body. It is called as second wind.
OXYGEN DEBT

The amount of oxygen taken by an athlete during the recovery period after strenuous activity is called as oxygen debt.

MODEL QUESTIONS AND ANSWERS

VERY SHORT ANSWERS (30 WORDS - 1 MARK)

1. Define anatomy.

Ans. Anatomy is the study of the structure of human body. Term anatomy comes from Greek words: ANA means apart and TOMY means to cut. It is because anatomy was first obtained through dissection.

2. Define physiology.

Ans. Physiology is the study of functions of human body. In other words physiology is the science of mechanical, physical, bioelectrical, biochemical functions of human organs and the cells of which they are composed of.

3. Name any four physiological systems of human body.

Ans. i. Skeletal System
   ii. Muscular System
   iii. Digestive System
   iv. Respiratory System

4. Define skeletal system.

Ans. The skeletal system is the bony framework of our body. It consists of all the bones of the body. It supports the body and gives it a shape.

5. What do you understand by joint?

Ans. Joint is the place at which two or more bones meet in the skeleton of the body. Joint may be fixed or movable.
6. Which is the longest and the smallest bone in human body?

Ans. The longest bone in human body is Femur (thigh bone). And the smallest bone in the human body is stapes (ear bone).

7. What is a muscle?

Ans. Muscle is the tissue composed of fibers capable of contracting to effect bodily movements or muscle is the body tissue that can contract and produce movement.

8. Enlist types of muscles.

Ans. i. Voluntary/skeletal/ striated muscle
    ii. Involuntary or smooth or spindle muscle
    iii. Cardiac muscle

9. Which is the hardest working muscle in our body?

Ans. Cardiac muscle is the hardest working muscle in our body.

10. Which is the strongest muscle in our body?

Ans. Jaw muscle is the strongest muscle in our body.

11. How many bones are there in a Child and an Adult?

Ans. A child has 213 bones and an adult has 206 bones.

12. What is tidal volume?

Ans. It is the volume of air that is taken in or given out during normal breathing.

13. What is vital capacity?

Ans. It is the volume of air that can be breathed out by force expiration after taking a deep breath. It is about 4800 cc in males and about 3100 cc in females.

14. What is heart rate?

Ans. It is the number of pumping/contractions of heart in one minute. It is about 72 times per minute under normal conditions in an adult.
15. **What is stroke volume?**

**Ans.** It is the volume of blood pumped out by heart in one beat/contraction. It is approximately 80 ml/beat in normal adult, whereas trained players have 110 ml/beat as stroke volume.

16. **What is cardiac output?**

**Ans.** Cardiac Output = stroke volume x heart rate. It is 5 to 6 litres at basal level. In untrained person, it can go upto 20 litres and in trained athletes it can go upto 40 litres.

**SHORT ANSWER TYPE (60 WORDS - 3 MARKS)**

1. **Explain structure of the muscle with the help of a diagram.**

**Ans.** There are about 600 voluntary muscles in the body. Each muscle is made up of thousands of long and narrow muscle cells called muscle fibers. These muscle fibers are arranged in bundles and enclosed within a tough layer of connective tissue called epimysium (sarcolema). Every muscle fiber is made up of very large number of microscopic threads called myofibrils. Myofibrils consists of protein molecules called actin and myosin.

![Muscle structure diagram](image)

2. **Explain external and internal respiration.**

**Ans.** Inhalation and exhalation are the two processes of external respiration. This breathing process oxygenate to the blood. It gets purified as carbon...
dioxide is removed from the blood. External respiration takes place in the lungs. Internal respiration is the process of respiration that takes place in the tissues and cells. Blood full of oxygen reaches the tissue where oxygen is used up during energy production process and carbon dioxide is then taken by the blood to the lungs.

3. Define the phenomenon of second wind. What are its causes and symptoms?

Ans. The breathlessness caused due to prolonged exercise is removed automatically by our body within short span of time of such exercise. This sense of relief is called ‘second wind’.

Causes of second wind: When we perform strenuous exercise, our body takes some time to adjust according to the increased demand of energy. So, the second wind occurs before the adjustment.

Symptoms of second wind:

i. Faster breathing

ii. Signs of tension and worry on the face

iii. Headache

iv. Suffocation in the chest appears

v. Pain in muscles

vi. Condition of giddiness appears. These painful feelings disappear with the onset of second wind.

4. What are the functions of respiratory system?

Ans. The main functions of respiratory system are given as under:

i. To exchange oxygen and carbon dioxide between the air and blood.

ii. To produce sound. It helps vocal chords to produce sound.

iii. To regulate blood Ph.

iv. To protect against some micro organism. Respiratory system blocks the entry of microorganism in the body at various levels, thus it provides protection against harmful microorganisms like virus, bacteria, etc.
5. Explain the functions of heart.

**Ans.** The main functions of heart are given below.

i. It circulates the pure blood to all parts of the body. This is called systemic circulation.

ii. It carries the impure blood from all parts of the body to the lungs for purification. This is called pulmonary circulation.

iii. It regulates the blood pressure.

iv. It regulates the heart rate.

v. Regular exercise improves the efficiency of the heart.

**LONG ANSWER QUESTIONS (150 WORDS) CARRYING 5 MARKS)**

1. What are the functions of blood?

**Ans.** Important functions of blood are given as under:

i. Transport of oxygen from the lungs to the tissues and carbon dioxide from the tissues to the lungs.

ii. It carries food material absorbed from the intestines to the tissue cells for growth, energy and repair process.

iii. It carries the waste products of cellular activity and carries them to kidneys, lungs and intestines for excretion.

iv. It carries hormones, vitamin and other chemicals to the place of need.

v. It helps to maintain water balance in the body.

vi. It regulates the body temperature.

vii. White blood cells of the blood acts as a defensive mechanism

2. What are the functions of skeletal system?

**Ans.** Main functions of skeletal system are given below.

i. **Shape and structure:** The boney framework gives human being its shape and structure like tall or small, thin or stout.
ii. **Support:** it gives support to the body that comes out as a human body. The bones provide support to our muscular system.

iii. **Protection:** bones protect our vital organs. Example: skull protects brain, thoracic cage protects heart, lungs and pancreas.

iv. **Lever:** bones act as a lever like a simple machine. For example while lifting a weight, movable joints like elbow joint acts like fulcrum and length of arm bone acts like crow bar to reduce effort and helps to lift weight.

v. **Store house:** The hollow space of bones acts like a storehouse of different minerals and salts like calcium, potassium, iron, etc.

vi. **Production of RBCs:** red blood cells are produced in the bone marrow. It is the factory to produce RBCs.

vii. **Junction:** bones provide junction or attachment to skeletal muscle that helps in visible movement.

viii. **Self repair:** Whenever bones are damaged, they are capable of doing self repair.

3. **Explain the structure of heart with the help of diagram.**

**Ans.** The human heart is a four-chambered muscular organ, shaped and sized roughly like a man's closed fist with two-thirds of the mass to the left of midline.

**Internal View of the Heart**
Chambers of the Heart

The internal cavity of the heart is divided into four chambers:

- Right atrium
- Right ventricle
- Left atrium
- Left ventricle

The two atria are thin-walled chambers that receive blood from the veins. The two ventricles are thick-walled chambers that forcefully pump blood out of the heart.

The right atrium receives deoxygenated blood from systemic veins; the left atrium receives oxygenated blood from the pulmonary veins.

Valves of the Heart

Pumps need a set of valves to keep the fluid flowing in one direction and the heart is no exception. The heart has two types of valves that keep the blood flowing in the correct direction. The valves between the atria and ventricles are called atrioventricular valves (also called cuspid valves), while those at the bases of the large vessels leaving the ventricles are called semilunar valves. When the ventricles contract, atrioventricular valves close to prevent blood from flowing back into the atria. When the ventricles relax, semilunar valves close to prevent blood from flowing back into the ventricles.

4. **Explain different types of joints in human body.**

**Ans.** Following are the different types of joints,

i. Immovable or fibrous joints.

They are fixed joints. They never move. Example: joints of skull.
ii. Slightly movable or cartilaginous joints.

These joints provide very little movement. Example: backbone joints, pelvic joints.

iii. Freely movable or synovial joints.

These joints provide different movements. There are five main types of movable joints.

a. **Hinge joint.** These joints allow a forward and backward movement. Example: knee joints, elbow joints.

b. **Pivot joint.** These joints give a rotation movement. Such as the movement of neck.

c. **Ball and socket joint.** In these joints one bone has ball like shape and other has a socket like shape. They are fit together to make a free movable joint. Example: shoulder joint and hip joint.

d. **Saddle joint.** It is a joint where one of the bones forming the joint is shaped like a saddle with the other bone resting on it like a rider on a horse. Example: wrist joint.

e. **Gliding joint.** It is a joint in which articulation of contiguous bones allows only gliding movements, as in the wrist and the ankle.
5. Write in detail about classification of bones.

Ans. CLASSIFICATION OF BONES

1. **Long bones:** They are long and wide. They act as lever. They are found in legs and arms. Example: humerus, femur, tibia and fibula.

2. **Short bones:** They are short in size and cube shaped. They are found in wrist and phalanges. Example: metatarsal and carpal.

3. **Flat bones:** These bones are flat and thin. They are composed of a central layer of sponge bone fixed between two outer layers of compact bone. Example: ribs and shoulder.

4. **Sesamoid bones:** These bones are seed like shaped and developed in the tendons where there is more friction. Example: palms of hands, sole of feet and knee caps.

5. **Irregular bones:** These bones have complexed shaped as compared to other types. The bones of spinal column and skull are examples of these bones.

6. **Sutural bones:** They are situated in sutural joints in the skull.
6. **Elucidate the importance of anatomy and physiology in the field of sports.**

**Ans.** Study of anatomy and physiology plays very important role in the field of sports because of following reasons.

i. **Helps in physical fitness:** Strong and fit body is an inevitable asset in the field of sports. Study of anatomy and physiology helps a sport person to understand the structure and function of different parts of human body and to acquire a fit and healthy body.

ii. **Provides knowledge about body structure:** on the basis of knowledge of body structure, a sport person knows about the strength and weakness of his body and accordingly they can develop forte in the field of game which is suitable for the sport person as per their body structure.

iii. **Helps in selection of games:** on the basis of knowledge of body structure, the coach and player can choose an appropriate sport/game which is suitable for a particular sport. Like tall students can be selected for basketball and volleyball. And short and stout students can be selected for weight lifting.
iv. **Protects from sports injuries:** on the basis of anatomy, sports equipments are designed that help in safe play.

v. **Helps in the process of rehabilitation:** knowledge of ligaments, tendons and muscles helps in rehabilitation from the injuries sustained during the game or sport.

vi. **Helps in maintaining healthy body:** study of anatomy and physiology provides detailed knowledge about all body parts, their nature and functions. This helps the player to adopt good, safe and healthy use of body.

vii. **Helps to know about individual differences:** there is a lot of difference between the body of male and female. The knowledge of anatomy and physiology helps in understanding these individual differences. On the basis of these differences, the size of the court, time of game and equipment are designed differently for male and female players.
CHAPTER 9

BIOMECHANICS IN SPORTS

BIOMECHANICS

Biomechanics is derived from Greek words, BIO + MECHANICS. Bio means living thing and mechanics is a field of physics. Thus, it is the branch of science which deals with the forces related to body movements.

Biomechanics is defined as systematic study of mechanics of body joints. According to Wikipedia, “Biomechanics is the study of the structure and function of biological system of humans.”

IMPORTANCE OF BIOMECHANICS IN SPORTS

- Improves performance in sports
- Improvement in technique
- Development of improved sports equipment
- Improve in training techniques
- Prevents sports injuries
- Helps in understanding human body
- Knowledge of safety principles
- Helps in research work
- Creates confidence in player
- Helps in maintaining healthy body
- Increases the popularity of sports
NEWTON'S LAW OF MOTION AND THEIR APPLICATION IN SPORTS

- FIRST LAW OF MOTION OR LAW OF INERTIA

According to first law of motion an object at rest will remain at rest or an object in motion will remain at motion at constant velocity unless acted upon by a force.

Example: - A moving football slows down and then stops often sometime. It comes to rest due to the fraction between the ground and the ball.

- SECOND LAW OF MOTION (The Law of Acceleration)

According to Newton's second law of motion, the rate of change of momentum of a body is directly proportional to the impressed force and takes place in the direction of force.

Example: - A cricket player while catching a ball moves his hands backwards. Initially the ball is moving with a certain velocity. The player has to apply a retarding force to bring the ballot rest in his hands.

- THIRD LAW OF MOTION

According to the Newton's third law of motion, to every action there is always an equal and opposite reaction.

Example: - The swimmer pushes the water in the backward direction with a certain force. Water pushes the man forwards with an equal and opposite force.

LEVERS - IT'S TYPES AND IT'S APPLICATION IN SPORTS

LEVER

Lever is a rigid bar which is capable of rotating about a fixed point called the fulcrum.

Example: - see-saw, scissors, pulley etc.

Skeletal system also acts like lever.
**CLASS I LEVER** - A first class lever has the fulcrum located between the force and the resistance.

Example- See-saw, a pair of scissors, bicycle brake.

**CLASS II LEVER** - A second class lever has the load or resistance located between the fulcrum and the force.

Example- wheel barrow, punching machine, Straight pushups, calisthenics etc.

**CLASS III LEVER** - A third class lever has the force located between the fulcrum and the resistance.

Example- baseball bat, Tennis racket, boat-paddles.

**EQUILIBRIUM: DYNAMIC AND STATIC**

EQUILIBRIUM: is defined as a state of balance or a stable situation, where opposite forces cancel each other out and where no changes are occurring.

**TYPES OF EQUILIBRIUM**

1. **Dynamic equilibrium**: dynamic stability is a balance of body during movement

2. **Static equilibrium**: is the balance of the body during its rest or stationary position.

**GUIDING PRINCIPLES TO DETERMINE DEGREE OF STABILITY**

1. Broader the base, greater the stability.

2. Lower the centre of gravity, higher the stability.

3. When the body is free in air, if the head and feet moves down then hip move up and vice versa.

4. Body weight is directly proportional to stability.

**CENTRE OF GRAVITY AND ITS APPLICATION IN SPORTS**

**CENTRE OF GRAVITY**

Centre of gravity is that point in a body or system around which its mass or weight is evenly distributed or balanced and through which the force of gravity
acts. The centre of gravity is fixed, provided the size and shape of the body do not change.

**FORCE**

Force can be defined as a push or pull by one body acting upon another. Force is a product of mass and acceleration of an object or person.

**TYPES OF FORCE**

1. Centripetal force
2. Centrifugal force
3. Gravitational force
4. Frictional force
5. Static force

**IMPORTANCE AND APPLICATION OF FORCE IN SPORTS**

1. Helps to move
2. Stops the moving object
3. Helps to accelerate
4. Helps in throwing object.
5. Helps to lift the object.
6. Helps to pull the object

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**MODEL QUESTIONS AND ANSWERS**

**VERY SHORT ANSWER QUESTIONS**

**(30 WORDS - 1 MARK)**

1. Define the term biomechanics.

**Ans.** Biomechanics is defined as systematic study of mechanics of body joints. According to Wikipedia, “Biomechanics is the study of the structure and function of biological system of humans.”
2. Name the laws of motion.

Ans. There are three laws of motion,
   i. 1st law of motion or law of inertia
   ii. 2nd law of motion or law of acceleration
   iii. 3rd law of motion or law of reaction

3. What is a lever?

Ans. Lever is a rigid bar which is capable of rotating about a fixed point called the fulcrum.

4. While walking, which law of motion is used?

Ans. While walking third law of motion, i.e. law of reaction is used.

5. What do you understand by equilibrium?

Ans. Equilibrium is defined as a state of balance or a stable situation, where opposite forces cancel each other out and where no changes are occurring.

6. What are the different types of equilibrium?

Ans. There are two types of equilibrium. Dynamic equilibrium and static equilibrium.

7. What is a force?

Ans. Force can be defined as a push or pull by one body acting upon another. Force is a product of mass and acceleration of an object or person.

8. What is centre of gravity?

Ans. Centre of gravity is that point in a body or system around which its mass or weight is evenly distributed or balanced and through which the force of gravity acts.

9. Why do we lean forward while climbing up a hill?

Ans. We lean forward while climbing up a hill to keep the centre of gravity low to maintain stability.
10. Which law of motion helps an athlete to take a quick start of a 100m race?

Ans. First law of motion, i.e. law of inertia helps athlete to take a quick start of a 100m race.

11. Which type of lever is used while we curl our biceps?

Ans. Class III lever is used while we curl our biceps.

12. Who will have greater stability?

   a. A fat person or a thin person of same height?

   b. A girl standing in stand at ease position or a girl standing on one leg?

Ans. a. A fat person

   b. A girl standing in stand at ease position.

**SHORT ANSWER QUESTIONS (60 WORDS-3 MARKS)**

1. Explain dynamic equilibrium.

Ans. Dynamic stability is balancing the body during movement.

   It frequently happens that the line of gravity of an athlete will fall outside the base of support for movement.

   For example, in a sprint start, the body weight is ahead of the supporting foot but before the body can fall forward the other foot moves ahead to provide support and the process repeats itself.

   A man carrying heavy bucket in his right hand leans towards his left hand side to maintain equilibrium.

   While climbing up a hill the climber bend forward so that he does not fall. The equilibrium is maintained by bringing the CG down.
2. **What is static equilibrium?**

**Ans.** A body is said to be in stable equilibrium if it comes back to its original position when it is slightly displaced. Static stability is very important in shooting, archery and hand stand in gymnastics, etc.

Stable objects generally have wide bases and low CG.

Bottom of the ship is made heavy to keep CG as low as possible. This makes the ship stable.

3. **Give example of each type of lever which our body uses during various activities.**

**Ans.** Following is the example of class I lever which is used by our body.

Our skull is the lever arm and the neck muscles at the back of the skull provide the force (effort) to hit football while we lift our head up against the football (load). When the neck muscles relax, our head nods/hits forward.
Following is the example of class II lever which is used by our body.

Our calf muscles and Achilles tendon provide the effort when the calf muscle contracts. The load is our body weight and is lifted by the effort (muscle contraction).

Following is the example of class III lever which is used by our body.

The biceps muscle provides the effort (force) and bends the forearm against the weight of the forearm and any weight that the hand might be holding.

**LONG ANSWER QUESTION (150 WORDS—5 MARKS)**

1. Explain in detail the principle of stability and its uses in sports.

   **Ans.**
   
   i. **Broad base of support:** for greater stability increase the area of the base and lower the centre of gravity as much as is consistent with the activity involved. Examples:

   a. a basketball player stops, spreads his feet wide as shoulder line and lowers his CG to dodge the opponent.
b. Defence position of the player in volleyball.

c. Wide stance of a golfer.

d. Tackling position of a player in football.

ii. **Stability is directly proportional to the weight of the body:** the object or a person with heavy weight will have greater stability as compared to person with less weight.

Example: it is difficult to move a heavier person as compared to less heavier person.

On the basis of this principle, wrestling, boxing, judo, etc. are organized according to different age groups.

iii. **Direction of an acting force:** to start quickly in one direction, keep the CG as high as possible and as near as possible to the edge of the base nearest to the direction of intended motion.

Example: the crouched position in starting a race, the CG is kept high by not bending the knees extremely and by keeping the hips high, also the lean of the body is towards the hands so that the weight rest on the hands. From this position, the movement hands are raised from the ground; motion starts by reason of the pull gravity. This pull is added to the force exerted against the starting block by the feet and thus aids in a quick start.

iv. **When the body is free in the air, if the head and feet move down, the hip move up and vice versa.**

Example:

a. This principle is applied in the high jump in western or velley roll technique at the take of, the head and one foot is thrust up as high as possible. As the head and one leg clear the bar, they are dropped which raises the hips to clear the bar. As the hips are lowered, the opposite leg is raised to clear the bar.

b. This is also used in pole vault, hurdles and jacknife, dive in swimming.
2. **State the three law of motion with suitable examples of its application in sports.**

**Ans.** **FIRST LAW OF MOTION OR LAW OF INERTIA**

According to first law of motion an object at rest will remain at rest or an object in motion will remain at motion at constant velocity unless acted upon by a force.

It also gives the idea that to change the state of rest or uniform motion of a body in a straight line some external agency is needed. This agency is called force.

Example:

a. A moving football slows down and then stops often sometime.

   It comes to rest due to the friction between the ground and the ball.

b. To take start in sprint races, to lift the opponent in wrestling, to start hammer throw.

**SECOND LAW OF MOTION (The Law of Acceleration)**

According to Newton's second law of motion, the rate of change of momentum of a body is directly proportional to the impressed force and takes place in the direction of force.

Example:

a. A cricket player while catching a ball moves his hands backwards. Initially the ball is moving with a certain velocity. The player has to apply a retarding force to bring the ballot rest in his hands.

b. In baseball player hits the ball hard to throw it far away.

**THIRD LAW OF MOTION**

According to the Newton’s third law of motion, to every action there is always an equal and opposite reaction.
Example:

a. The swimmer pushes the water in the backward direction with a certain force. Water pushes the man forwards with an equal and opposite force.

b. Walking: when a person walks on the road, he presses the ground in backward direction and the ground exerts an equal and opposite force on the person in the forward direction.

c. Shooting: when a bullet is fired from a rifle with a certain force (action) there is an equal and opposite force exerted on the rifle in the backward direction (reaction)

3. What do you know about centripetal force and centrifugal force? Explain its application in sports.

Ans. Centripetal force: this is the force that pushes or pulls an object towards the axis of rotation in order to make it follow a curve or circular pathway. When a player swings a bat, he applies centripetal force to make that bat follow the arc of swing.

Centrifugal force: this is the force that pushes or pulls an object outward from the axis of rotation. This force is equal and opposite of the centripetal force.

Centripetal and centrifugal force have innumerable application in sports like,

Centripetal force is needed by the player to maintain his grip. If the rotational momentum is more, the centrifugal force could cause the player to lose his grip and the bat may go of the hand.

These forces act when a runner takes a sharp bend leans inward to obtain the necessary centripetal force.

A cyclist going round the curve leans towards the centre of the curve in order to get necessary centripetal force.
4. What do you know about lever? What are different types of levers. Explain the application of lever in sports.

Ans. LEVER

Lever is a rigid bar which is capable of rotating about a fixed point called the fulcrum.

Example: - see-saw, scissors, pulley etc.

Skeletal system also acts like lever.

CLASS I LEVER - A first class lever has the fulcrum located between the force and the resistance.

Example- See-saw, a pair of scissors, bicycle brake. Rowing: in rowing, application of the force on the oars at the axis.

CLASS II LEVER - A second class lever has the load or resistance located between the fulcrum and the force.

Example- wheel barrow, punching machine,

Straight pushups, calisthenics, lifting of legs from the ground, etc.

CLASS III LEVER - A third class lever has the force located between the fulcrum and the resistance.

Example- baseball bat, Tennis racket, boat-paddles, curling of biceps, etc.
5. **Elucidate the importance of biomechanics in sports.**

**Ans.**

i. **Improves performance in sports:** principles of biomechanics tell us about right techniques, effective and result oriented posture to get more efficient results by applying minimum muscular force which in turn improves performance in sports.

ii. **Improvement in technique:** with the help of biomechanical principles the physical education teacher corrects the mistakes. This helps in improving the game and performance of the player.

iii. **Development of improved sports equipment:** the principles of biomechanics are used to modify the sports equipments. For example, tee shirts, studs, spikes, swimming costumes, hockey sticks, different size footballs and low weight helmets for protection.

iv. **Improve in training techniques:** a teacher can analyse the player’s movement or action with the help of the biomechanical principles. It helps in improving the training techniques.

v. **Prevents sports injuries:** it helps to find out the factors or the forces that can lead to the injuries during the game situation. It also helps in prevention of the sports injury.
vi. Helps in understanding human body: it gives the knowledge of different systems of our body. For example, nervous system, muscular system and skeletal system.

vii. Knowledge of safety principles: biomechanics gives the understanding to analyse different movements that can harm the player. The teachers remove those unnecessary and harmful movements.

viii. Helps in research work: biomechanics helps in teaching and learning process. It also helps the teacher to acquire precision and accuracy of movement.

ix. Creates confidence in player: The player knows that he is executing the movement scientifically with the help of principal of biomechanics. Thus the confidence of the player is enhanced.

x. Helps in maintaining healthy body: Principals of biomechanics gives deep knowledge about the effect of physical forces and movements over the body as well as the movements which are safe and promotes health. Thus biomechanics helps in maintaining healthy body.

xi. Increases the popularity of sports: biomechanical principles have brought remarkable improvements in respect of technique, equipment, skill and play fields. It helps in promoting the games and sports in the masses.
CHAPTER 10

PSYCHOLOGY AND SPORTS

a. Psychology : Psychology is the study of mind and behaviour

b. Sports Psychology : Sports Psychology is an applied Psychology involving applications of psychological principles to the field of physical education and sports.

c. Importance of sports psychology
d. **Growth and Development**: Growth “The term growth of parts of the education means the growth of parts of the body, may be in size, height and weight

Development can be defined as progressive series of changes in an orderly coherent pattern.

e. **Different stages of growth and development**

5 stages of growth and development

- **Infancy** → 0 to 5 years
- **Early childhood** → 6 to 9 years
- **Late childhood** → 9 to 12 years
- **Adolescence** → 12 to 18 years
- **Adulthood or Maturity** → 18 yrs onwards,

f. **Adolescence, Problems of Adolescence and Management of Problems of Adolescents**

Adolescence → Adolescence is the period of change from childhood to adulthood
g. **Define Learning, Laws of learning and Transfer of learning**

Learning → Learning is a life long process: it starts in the womb and ends in the tomb.
Learning is adaptation and adjustment.

Laws of learning
- Primary laws of learning
  - Law of effect
  - Law exercise
- Secondary laws of learning
  - Law of contioncity
  - Law of similarity
  - Law of primacy
  - Law of Recency

Transfer of learning, Types of Transfer of learning, factor affecting transfer of learning

Transfer of learning occurs when a person’s learning in one situation influence his learning and performances in other situation

(i) Positive Transfer – When there is an improvement in a performance as a result previous learning or training
(ii) Negative Transfer – When learnt one skill makes learning of the second skill more difficult
(iii) Application Transfer – When previous learning is applied successfully to life situations.
(iv) **Bilateral Transfer**

When there is a change of performance in a number on one side of the body as a result of training the corresponding member on other side.

(v) **Proactive Transfer**

Learning of a skill affects the learning of a skill yet to be learnt.

(vi) **Retroactive Transfer**

A skill recently being learnt affects the previously learnt skill.

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**Factors affecting transfer of learning**

- Learner’s will
- Learner’s Intelligence
- Learner’s Personal achievements
- Identical subject matter
- Depth original understanding

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**h. Plateau and causes of Plateau**

**Plateau** - A period of little or no apparent progress in an individual’s learning, marked by an inability to increase speed, reduce number of errors etc and indicated by a horizontal stretch in a learning curve or graph.
i. **Concept of emotions and methods of controlling emotions.**

Emotions \(\rightarrow\) emotions are intense feeling that are directed at some one or somethings. Emotions are subjective conscious experiences characterised by expressions, biological reactions and mental status.

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**Methods of controlling emotions**

- Enjoy nature
- Stop and evaluate
- Control your breathing
- Find something positive about the situation
- Recognise the another way

---
Q1. Give definition of Psychology?

Ans. Psychology is the science of human behavior.

Q2. What do you understand by term Sports Psychology

Ans. Sports psychology is the application of psychological Principles to sports and physical activity at all levels of skill improvement.

Q3. Define the term Growth and development?

Ans. Growth - The term growth in physical education means the growth of the parts of the body, may be in size, height and weight Development can be defined as progressive series of changes in an orderly coherent pattern.

Q4. Define Adolescence?

Ans. Adolescence is the period of great stress and strain, storm and strife

or

Adolescence is the period of change from childhood to adulthood.

Q5. Which type of physical activities can be played in early childhood?

Ans. The play activities in the age group should not be strenuous because physical capacities develop slowly. The fundamentals of various games and sports which are simple should be introduced.

Q6. Which type of physical activities can be played during adolescence?

Ans. In this age group team sports, individual sports, athletics, gymnastics, swimming and floor dancing etc. can be played.

Q7. What do understand by learning?

Ans. Learning in the broadest sense, is the organisations of behaviour according to the performance demands of some task.
Q8. Mention two laws of learning
Ans. 1. Primary laws of learning
     2. Secondary laws of learning

Q9. Define Transfer of learning?
Ans. Transfer of learning occurs when a person’s learning in one situation influences his learning and performances in other situations.

Q10. What is positive transfer of learning?
Ans. When there is an improvement in a performance as a result of previous learning or training.

Q11. What is negative transfer of learning?
Ans. When learning one skill makes learning of the second skill more difficult.

Q14. Write note on Infancy?
Ans. During this stage of body, the growth and development occur in progressive manner individual gains considerable weight and height. The cognitive development starts.

Q15. Enlist the problems of adolescence.
Ans. - Aggressive and violent behaviour
     - Physical problem
     - Lack of concentration
     - Attraction towards opposite sex

SHORT ANSWER TYPE QUESTIONS (60 WORDS)
CARRYING 3 MARKS

Q. Mention the importance of sports psychology
Ans. 1. Improve performances - The Knowledge of sports psychology helps to improve performance and personality of players’s by scientific ways of modifying behaviour
2. Motivation and feedback - proper motivation and proper feedback enhances the performance of players. It gives counseling to players. This can be guided by sports psychology.

3. Better selection: The knowledge of sports psychology guides the coaches for better selection of players.

Q2. Explain the law of exercise.
Ans. Law of exercise - Repetition of experiences increase the probability of a correct response but it will not enhance learning without satisfying effect following the response. This law is also known as law of use and disuse. Practice makes the learning bond stronger thus more we practice or use the better is learning.

Q3. Enlist the secondary laws of learning and explain any one law.
Ans. Secondary law of learning
- Law of continuity
- Law of similarity
- Law of belongingness
- Law of Attitude
- Law of Primacy

Law of belongingness
If the mutual relationship between stimulus and response is natural then learning is more effective for example running, jumping and throwing are natural activities therefore these activities are easy to learn. Along with this, these activities can be learnt quickly. The activities which are artificial or unnatural are difficult to learn such as to run backward while using hands and legs properly is difficult.

Q4. Describe any two developmental characteristics of adolescence
Ans. Physical characteristics
(i) Gain in height, weight and ossification of bones is almost complete
(ii) Endurance is developed to a great extent
(iii) Co-ordination of muscles reaches its peak.
Mental characteristics

People of this age begin to think and feel differentially. Hormonal changes reflect in behaviour and mood. Teenages become sulking, short tempered, moody and irritable. They also become very self conscious and extra sensitive.

Q. Highlight the differences between growth and development

<table>
<thead>
<tr>
<th>Ans.</th>
<th>Growth</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Growth is used in purely physical terms. It generally refers to change in size, length and weight of an individual</td>
<td>(i) Development implies changes in shape, form or structure resulting in improved functioning or working</td>
</tr>
<tr>
<td>(ii)</td>
<td>Growth is one of the aspect of development Process</td>
<td>(ii) Development is a wider and comprehensive term; it refers to overall changes in the individual</td>
</tr>
<tr>
<td>(iii)</td>
<td>Growth does not continue throughout Life</td>
<td>(iii) Development is a continuous process</td>
</tr>
</tbody>
</table>

Q6. Describe the development characteristics during early childhood.

Ans. - Physical characteristics
- It is a period of slow but steady growth in height. Bones are soft.
- Weight increase in steady
- Pulse rate is higher than adults
- The heart size is smaller in comparison to the body.
- Strength is not well developed

Mental Characteristics
- Child loves to take part in exercises and activities
- Imitations is a strong Characteristics
- Sex differences have no role in activities.
Q7. Give the ways to overcome Plateau?

Ans. (i) Develop interest: Develop interest and bring recreation in training. This gives enjoyment and pleasures to perform activity.

(ii) Reduce competition - Too much competition should be avoided and equal levels should be considered for competition.

(iii) Proper rest and recovery - Proper rest and recovery should be taken to overcome plateau. Care should be taken that it should not be too long.

Q9. Explain the concept of emotions.

Ans. Emotions are consistent responses to internal or external events, which have particular significances for organism. These response may be verbal, physiological, behavioural and natural mechanism emotions may be positive or negative like joy versus sadness anger versus fear, trust versus distrust, surprise versus anticipation.

LONG ANSWER TYPE QUESTION
(ISO WORDS) 5 MARKS

Q1. Explain any four problems of adolescents

Ans. (1) Aggressive and Violent Behaviour: Adolescent has aggressive behaviour and often becomes violent very fast. They easily become irritated and repulsive when work is not of their interest.

(2) Problems related to physiological growth. The physiological changes associated with adolescence present conditions and problems that the adolescence has not met upto this time and in may cases is ill prepared to meet them when they appear.

(3) Confusion between adolescent's role and status unfortunately neither the adolescent's role nor his status is clear cut in the society. A boy may be treated like a man in many situations outside but like a child in his own home.

(4) Problems related with the future: The adolescence is a period when the individual is not a child, he has emerged from the safe and
protected life of childhood. He has now to decide as to what course of life he has to follow.

Q. Discuss the factors affecting transfer of learning.

Ans. They are some of the factors which affect the transfer of learning they are:

(1) Learner’s will - If the learner has strong will, he will be able to transfer his learning more to new situations.

(2) Learner’s Intelligence - Learner’s Intelligence plays a vital role in the transfer of learning. It has been observed that the students who have more intelligence are for better in transfer of learning in comparison to those who have normal intelligence.

(3) Depth of original understanding - If a student has enough depth of original understanding of a skill, he becomes more capable of learning new skills.

(4) Learner’s Personal Achievement : The learner’s personal achievement in the field of education have a positive effect on the transfer of learning.

(5) Training in transfer - If a student has imparted training in transfer he becomes capable of learning new skills very easily. If he is not provided such training it will be very difficult for him to learn the skills.

Q3. What is Plateau? Mention its causes.

Ans. The general trends of rapid beginning continues for some time after it slows down and reaches a level where no further improvement occurs. The learning curve travels in almost a horizontal plane. These horizontal stretches indicative of no apparent progress are called plateau.

Causes of Plateau

(1) Boredom - Some routine work often brings boredom, it is one of the cause of boredom

(2) Lack of Practice - Lack of practice often causes plateau and stagnated performance
(3) Dirty environment - Poor, dirty and unsafe environment may cause plateau.

(4) Lack of Motivation - Lack of Motivation and less feedback often causes long learning plateau.

Q4. Define learning and state primary law of learning?

Ans. (i) Learning may be defined as the process by which behaviour originates or is altered through training or experience.

(ii) It is regarded as modification of both behaviour and the way of perceiving.

Primary laws of learning are as follow-

(1) Law of effect - is a satisfying effect following the response strengthens the connection between stimulus and the behaviour.

(2) Law of exercise - repetition of experience increases the probability of a correct response but it will not enhance learning without a satisfying effect following the response.

(3) Law of readiness - The execution of an action in response to a strong impulse is satisfying but the blocking of action or forcing is annoying.

Q5. Explain emotion. How can we control emotion?

Ans. (i) Emotions are intense feeling that are directed at someone or something. They are subjective, conscious experiences characterised by expressions, biological reactions and medical status.

(ii) It is complete physiological state that involve three distinct components

(a) a subjective experience

(b) a physiological response

(c) a behavioural or expressive response

Methods of controlling emotions :

1 Stop and evaluate - One of the best thing you can do is mentally stop yourself and look at the situation. Then think the positive aspects of your current situation.
2. Physical activity - It changes the mood by taking in distraction, thus perform physical activity.

3. Take proper food : Amount of salt may be reduced in food. Quantity of potassium may be controlled which is responsible for systolic and diastolic pressure reduction in blood. We should include pear, tomato, banana, orange and nuts in our food.

4. Avoid tension : Tension increases high BP. So we should remain tension free in difficult situations also participation in games and entertainment activities reduce high BP.

5. Exercise regularly and participation in games and sports : Regular exercise help in reduction of high blood pressure. Average types of exercise done vigorously for a longer period of time are very effective in reducing high BP. In the beginning exercise may be done at slow pace, then the pace may be increases slowly.
CHAPTER 11

TRAINING IN SPORTS

MEANING AND CONCEPT OF SPORTS TRAINING

The Training is a process of preparing an individual for any event or an activity. Sports Training is the Physical, technical, intellectual, Psychological and moral preparation of an athlete or a player by means of physical exercise. Sports training also consists of all those learning, influence and process that are aimed at enhancing Sports performance.

PRINCIPLES OF SPORTS TRAINING

1. Principle of Overload
2. Principle of Progressive Development
3. Principle of Continuity
4. Principle of Variety
5. Principle of Individuality
6. Principle of Specificity
7. Principle of Active Participation
8. Principle of Periodisation
9. Principal of Rest and Recovery
10. Principal of General and Specific Preparation
Warm-up and limbering or cool down

**Warm-up** :- It is a primarily preparatory activity in which physiological and psychological preparation of athlete for the main activity, takes place.

**Types of warm-up:**

1. **General Warm-up**
2. **Specific Warm-up**

**Cooling or Limbering down** :- To bring the body in normal state after any competition or training is called cooling down.

**Load** :- Load is known as work or exercise that a sportsperson performs in a training session.

**Adaptation** :- It is the process of long-term adjustment to a specific stimulus.

**Recovery** :- Recovery is to regain energy after workout what was lost during the activity.

**Skill, Technique and style** :- A skill is the ability to perform a whole movement. Skill can be defined as automatisation of motor action.

**Technique** :- It is an basic movement of any sports or event. We can say that, a technique is the way of performing skill.

**Style** :- It is an individuals expression of technique in motor action, therefore each sports person due to his specific or particular psychic, physical and biological capacities realize the technique in different way. It is called his style.

**VERY SHORT QUESTION (I MARK QUESTION) [30 WORDS]**

1. Define sports training ?
   
   Ans. Sports training is the basic form of preparation of sportsperson

2. Define Warm-Up ?
   
   Ans. Warm-up is process of heating the whole body by running and performing exercise prior to the competition.
3. What is Limbering or cooling down?
   Ans. It is process to bring the body in normal state after training or competition.

4. Define Load?
   Ans. It is process of long-term adjustment to a specific stimulus.

5. Define Recovery?
   Ans. Recovery is to regain what we lost after training or competition. Recovery is an essential part after exercise or training load.

6. What is skill?
   Ans. A Skill is the ability to perform a whole movement.

7. What is Technique?
   Ans. Technique is defined as the motor procedure for taking a motor task. Motor procedure should be understood as a system of movement of body parts in a definite sequence.

**SHORT QUESTION (3 MARK QUESTIONS) [60 WORDS]**

Q.1 Explain the Types of warm-up?

Ans. There are two types of warm-up

1. General warm-up

2. Specific warm-up

1. **General warm-up** - It is usually performed in all types of activities such like Jogging, running, jumping, stretching, calisthenics, striding, wind sprints and other General exercise. It increases coordinative abilities and flexibility of muscles and joints.

2. **Specific Warm-up** :- In this type of warm-up specific types of exercises are performed after the activities of general warm-up. Specific type of warming-up differs from activity to activity.
Q.2 Write down the Guiding Principles of Warming-up in brief.

Ans. In the warming-up there are certain Guiding Principles of Warming-up as in the following way:-

1. Simple to complex
2. Exercise for all the parts of body
3. Stretching and Loosing Exercise should be included
4. Intensive enough to Increase Body Temperature
5. Warming-up should be according to the activity or sports
6. Concerned Movement of Games should be included.
7. Warming-up should be done at Exact time
8. Warming-up should be according to Age and Sex.

Q. Write down the importance of Limbering Down?

Ans. Limbering down is the important part of any training or competition as it is essential to bring the body back to its normal position.

There are certain advantage or importance of Limbering down :-

1. Body temperature become normal
2. Proper removal of waste product
3. Decrease in tension
4. Reduces the chances of dizziness or fainting
5. Decrease in the level of adrenaline in the blood
6. Heart rate returns to initial stage
7. Muscles do not remain stiff.
8. Supply of Oxygen normalises
Q. Explain in detail the classification of Skills.

Ans. There are a number of sports activities and each activity requires a set of Skills. There are various skills such as shooting in basket ball, serving in badminton, overhead kick in football. Owing to many characteristics of skill, it is really difficult to clarify them. Generally, there are following skills:-

1. Open Skill: The Skill which are not under control and are unpredictable are classified as open skill. Example:- football, hockey.

2. Closed Skill: close skills take place in a stable, predictable environment and the performer knows explicitly what to do and when to do for example free throw in basketball and serving in squash or tennis.

3. Simple skill: the skills which do not require large amount of coordination, timings and decision. These skills are straight forward, easy to learn and not difficult to perform, for example chest pass, underarm service and straight jump.

4. Complex Skill: The skills, which require large amount of coordination, timing and quick thought process are called complex skills. For example handspring in Gymnastics, Overhead kick in football.

5. Gross Skills: The skills, which involve large muscle movements and do not have precise movements are called gross skills.

6. Fine Skills: These skills include complex precise movements using small muscle groups. For example A snooker shot and playing the piano.

7. Discrete Skills: These skills are brief and have a clearcut beginning and end. For example penalty kick in hockey.

8. Continuous Skills: These skills have no obvious beginning and end the end of one cycle of movement and beginning of the next. For example cycling is example of continuous skills.
Coactive skills:- Coactive skills are those skills which are performed at the same time as others without direct confrontation. For example swimming and running.

Interactive Skills:- Interactive skills are those skills where other participants or performers are directly involved. For example football, netball and handball.

Serial Skills:- These skills are a group of discrete skills which are performed in serial to make a complex movement for example sequence of skills in triple jump.

Individual Skills:- Individual skills are those skills which are performed in isolation. For example high jump and long jump.

LONG QUESTION- [150 WORDS]

LONG ANSWER (5 MARK QUESTIONS)

Q. What do you mean by the Sports Training and Explain principals of sports training?

Ans. Sports Training is the process of all the scientific and systematic channel of preparation of sportsperson for the highest level of sports performance. Sports training also consists all those learning influences and process that are aimed at enhancing sports performance:-

Principles of Sports Training :-

Principle of Over Load
Principle of Progressive Development
Principle of Continuity
Principle of Variety
Principle of Individuality
Principle of Specificity
Principle of Active Participation
Principle of Periodisation

1. **Principle of Overload**:- The principle of overload states that there should be greater than normal load on the body as required for training adaption to take place. For example to increase endurance, muscle must work for longer period of time than they used to.

2. **Principle of Progressive Development**- According to this principle, the load should be increased step-by-step, so that players can handle easily. The principle of progressive development also makes us realize the need of proper rest and recovery.

3. **Principle of continuity**:- According to this principle, the training should be a continuous process. There should not be any break. The interval between two training session should be maximum but not too long.

4. **Principle of Variety**:- For a successful coach the training plan should be in variation so as to maintain the interest and motivation of the athlete. For example changing the nature of exercise, timing and environment.

5. **Principle of Individual Differences**:- According to this principle, every sportsperson is different due to individual differences. For example compared to male athlete an women athlete require more recovery time for the same event.

6. **Principle of Specificity**:- This principle states that exercising a certain part or components of the body primarily develops that part.

7. **Principle of Active involvement**:- the principle of active involvement means that for an effective training programme the athlete must participate actively and willingly.

8. **Principle of Periodisation**:- The sports training programmes are developed through various training cycles such as macro cycles, meso and micro cycles.
1. Macro Cycles. - duration 3 to 12 months.

2. Meso Cycles:- duration 3 to 6 weeks.

3. Micro cycles:- duration 3 to 10 days.

9. Principle of General and specific Preparation:- For the improvement of the performance, both the general and specific preparation are equally important. General preparation serves as the base for specific preparation.

10. Principle of Rest and Recovery:- According to this principle, the training programme should be made in such away there should be proper rest and interval between training activities.

Q. Explain the process of stimulus, Recovery and Adapatation?

Ans. Our body is made up of millions of very small living cells. Each type of cell or group of cells performs a different job. All the cells have the ability to adapt to what is happening to the body. The adaptation takes place inside the body all time. There is also an adaptation to the training for games and sports because its helps to increase the sports performance for improving the sports performance the training load has to be increased. Stagnation training load means stagnation in performance. When a sportsperson’s fitness is challenged by a new training load there is a response from body. The response by the body is an adaptation to the stimulus of the training load. The initial response is of fatigue. When the loading stops, then process of recovery from fatigue and adaptation to the training load starts. The process of recovery and adaptation returns to the sportspersons not just to his previous fitness level but to an improved level.

Q. What do you mean by Technique and Skill, describe?

Ans. Technique:- Technique is defined as the motor procedure for tackling a motor task. Motor procedure should be understood as a system of movement of body parts in a definite sequence. Thus, we can say Techniques are the basic movements of any sports or event. The Motor procedure or technique is always take or goal oriented. Therefore, different techniques are required in different sports. In shotput for example, the motor task is to put the shot as far as possible, whereas in weightlifting in clean and jerk the motor task it to lift as much weight as possible. In
team game, the sportsmen are required to tackle a variety of tasks under different conditions. Therefore in sports the sportsman has to learn a number of techniques with possible variation. The most common form of presenting the technique is verbal and physical. The physical aspects of technique is conveyed through demonstrations and audio-visual aids.

**Skill:** A motor skill is acquired through a long process of motor learning. Technical skills in sports therefore, represent automatisation of motor procedure. A sportsman tries to learn a technique and through continuous and systematic process, — is liable to acquire the skill i.e. automatisation of the motor procedure. In other words, we can say that skill is the capacity of the sportsman to realize technique in actual motor action.

**Q.** Write down the Method of Warming-Up in detail.

**Ans.** There are following methods of Warming-up which are generally used:

I **General Method**

1. **Jogging:** Every athlete should perform Jogging or slow running for 5 to 10 minutes to increase the body temperature.

2. **Simple Exercise:** This is also a way of warming-up. The exercise should be performed from simple to complex.

3. **Striding:** It means running the distance with long strides. The distance of running should be not more than 50 metres.

4. **Stretching Exercise:** Stretching is one of the most critical parts of warm-up and of an athlete's performance. A more flexible muscle is stronger and healthier.

5. **Wind sprints:** This is the last part of warming-up. It is usually done with spikes on. In wind sprints the distance of 25 to 30 m may be covered.

II **Warm-up with warm water:** Warm-up with warm water is usually done in developed countries.

III **Warm-up through Massage:** This is an old method of warm-up. It was used in India by Wrestlers to get warmed-up.
IV Warm-up by Hot Drinks:- Before the competition use of coffee or tea to get them warmed up, but it is not considered a good method.

V Through Sun Bath:- the body can be warmed up through sunbath up to some extent, but most of sports this method of warming-up is not usually applied.

VI Through Steambath:- The body can be warmed up through steambath. Energy can be saved through steam bath but this method of warming-up also not used frequently.
| Q.1. | Explain the meaning of physical fitness. | 1 |
| Q.2. | What is the aim of physical education? | 1 |
| Q.3. | State the type of “Warning Up” discuss. | 1 |
| Q.4. | Define sports psychology? | 1 |
| Q.5. | What do you mean by adolescence? | 1 |
| Q.6. | Write a short note on biomechanics? | 1 |
| Q.7. | What does the organizers intend by saying the “only such students shall participate on the intramurals football competition championship in the past 2 years.” | 1 |
| Q.8. | Define Anatomy? | 1 |
| Q.9. | What do you understand by measurement? | 1 |
| Q.10. | When and how did the modern Olympics games begin? | 1 |
| Q.11. | Explain the meaning of word “Yuj”. | 1 |
| Q.12. | Highlight the components of positive life style. | 3 |
| Q.13. | “Physical Education is an integral part of general education” Justify this statement. | |
| Q.14. | What are the functions of “IOA”? | |
| Q.15. | Elaborate the importance of Yoga in modern times. | 3 |
| Q.16. | What do you mean by doping? List down the types of doping. | 3 |
| Q.17. | Why there is a need of sports environment? | 3 |
Q.18. Explain the importance of test and measurement in the field of sports.

Q.19. Classify the types of muscles in our body and how do they work. Name any skeletal muscles?

Q.20. Explain the importance of biomechanics in physical education and sports.

Q.21. What do you mean by growth and development? Differentiate between them.

Q.22. Define sports training? Enumerate the principles of sports training.

Q.23. State the difference between the following terminologies:
   (a) Skill and techniques
   (b) Load and adaptation

Q.24. Define skeleton system? Explain about the freely movable joints in detail.

Q.25. Enlist the sports awards and explain about any one in detail?

Q.26. What are the side effects of prohibited substances explain in detail.
Q.1. Explain the term “physical Activity environment”
Q.2. What do you mean by “life style”
Q.3. State the aim of physical education.
Q.4. Define psychology.
Q.5. What do you mean by learning?
Q.7. What does the organizers instead by saying that “only such students shall participate in the intramurals cricket competition who have not represented the school in any cricket championship in the past 2 years.
Q.8. What do you mean by human Anatomy?
Q.9. Define Test?
Q.10. When and how did the ancient Olympics Games begin.
Q.11. What is pranayam?
Q.12. Explain the factors which effect wellness?
Q.13. “Physical Education is an integral part of general education” justify this statement.
Q.14. Elaborate the functions of “IOC”.
Q.15. It is universal truth that modern age is the age of stress, tension and anxiety “How can yoga help is in prevention and management of these profitness.
Q.16. What do you mean by prohibited substance? Explain the homologous blood doping?

Q.17. Enlist the various career options available in the field of physical education and sports.

Q.18. What do you mean by measurement? Illustrate the importance of test and measurement in the field of sports?

Q.19. Discuss about the structure, location and function of heart in the human body?

Q.20. “Nowadays biomechanics is playing a vital role in improving the performance of sports persons” Justify this statement?

Q.21. Explain the developmental characteristics of adolescence?

Q.22. What do you mean by warming up? Enumerate the methods of warming up in detail?

Q.23. What do you mean by muscular system of the human body. Explain the structural classification of muscles in detail?

Q.24. Explain about the functions of skeletal system? Elaborate the freely movable joints in detail.

Q.25. Discuss about the organizational setup of CBSE spots?

Q.26. Describe about in competition and out of competition testing for doping control?
Important Notes to Remember

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