1. PLANNING IN SPORTS

EXERCISES

A. Multiple-Choice Questions

1. Which formula is used to find out the number of matches in a double league tournament?
   (a) N × N (b) N (N – 1) (c) (N – 1) (d) N × N × N
2. What is the formula to find the number of matches in a knockout tournament?
   (a) N (b) N (N – 1) (c) (N – 1) (d) (N + 1)
3. Which of the following is not a major game?
   (a) Hockey (b) Football (c) Badminton (d) Karate
4. It is a process/procedure of shuffling the position of good teams so that they don't meet each other in an early stage of the competition and spectator interest is kept alive till finals. What is the name of this process?
   (a) Intramural (b) Seeding (c) Fixture (d) Extramural
5. Which sports competition is organised within the school itself?
   (a) Extramural (b) Intramural (c) Inter-state (d) None of these
6. Which of these is not one of the methods used for fixtures in League or Round Robin tournaments?
   (a) Cyclic method (b) Spiral method (c) Staircase method (d) Tabular method

2. SPORTS AND NUTRITION

EXERCISES

A. Multiple-Choice Questions

1. What is another name of riboflavin?
   (a) Vitamin B (b) Vitamin B_5 (c) Vitamin B_2 (d) Vitamin C
2. Who discovered vitamin A?
   (a) Theo Haimann (b) Elmer MacCollum (c) O'Donnell (d) None of these
3. Which of the following vitamins is insoluble in fats?
   (a) A (b) E (c) K (d) C
4. Deficiency of which of the following leads to rickets?
   (a) Iron (b) Iodine (c) Calcium (d) Chromium
5. What is the calorific value of water?
   (a) 10 joules/calorie (b) 0 joules/calorie (c) 25 joules/calorie (d) 100 joules/calorie
6. If the weight is in kg and height in m, which of these is the correct formula for calculating Body Mass Index?
   (a) weight x $(\text{height})^2$ (b) $\frac{\text{weight}}{(\text{height})^2}$ (c) $\frac{\text{height}}{\text{weight}}$ (d) $\frac{\text{weight}}{\text{height}}$

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3. YOGA AND LIFESTYLE

EXERCISES

A. Multiple-Choice Questions

1. What is/are the cause/s of obesity?
   (a) Genetics (b) Overeating (c) Physical inactivity (d) All of these
2. Which of the following asanas are beneficial for diabetes?
   (a) Hastasana, Vajrasana, Vrikshasana
   (b) Bhujangasana, Paschimottanasana, Ardha Matsyendrasana
   (c) Vajrasana, Trikonasana, Matsyasana
   (d) Parvatasana, Shavasana, Chakrasana
3. Which one of the following is not a cause of hypertension?
   (a) Genetic causes (b) Obesity (c) Lack of exercise (d) Incorrect body posture
4. Which asana is also known as the upward facing bow pose?
   (a) Dhanurasana (b) Tadasana (c) Chakrasana (d) Vakrasana
5. Which asana is also known as the diamond pose?
   (a) Tadasana (b) Vajrasana (c) Shalabhasana (d) Shavasana
6. Which of these is not one of the asanas prescribed for relief from asthma?
   (a) Sukhasana (b) Matsyasana (c) Parvatasana (d) Hastasana

4. PHYSICAL EDUCATION AND SPORTS FOR CWSN

(Children With Special Needs – *Divyang*)

EXERCISES

A. Multiple-Choice Questions

1. For a child to be considered in the severe cognitive disability category, his/her IQ has to be below what value?
   (a) 70 (b) 55 (c) 30 (d) 15
2. Children suffering from which disorder find it difficult to pay attention to things and are always restless?
   (a) SPD (b) ADHD (c) OCD (d) ODD
3. Which of these is a disorder suffered by people who have experienced some kind of extreme violence?
   (a) PTSD (b) SPD (c) ASD (d) ODD
4. What is the name for the condition under which a person has difficulty in comprehending written text, spelling and writing accurately?
   (a) Spina bifida (b) Epilepsy (c) Dyslexia (d) Arthritis
5. Sam's sister has the habit of washing her hands every few minutes and spends her entire day arranging things exactly the way she wants. Which of these is a possible disorder she might be suffering from?
   (a) ADHD (b) ASD (c) OCD (d) ODD
6. Which of these is not one of the results of physical activities in children with special needs?
   (a) Improvement in confidence (b) Improvement in endurance
   (c) Increase in depression (d) Better hand-eye coordination

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5. CHILDREN AND WOMEN IN SPORTS

EXERCISES

A. Multiple-Choice Questions

1. What are the two types of motor development of muscles in the body?
   (a) Gross and fine (b) Gross and net (c) Coarse and fine (d) Gross and measured
2. In children, motor control of the head comes before the control of the legs. This head to tail sequence is known as the _____ trend. Which of these words fills the blank?
   (a) Proximodistal (b) Cephalocaudal (c) Cephalopodal (d) Proximoaxial
3. Which of these asanas is suggested for relief from lordosis?
   (a) Chakrasana (b) Vajrasana (c) Halasana (d) Matsyasana
4. In which postural deformity is there an abnormal lateral curvature of the spine?
   (a) Kyphosis (c) Lordosis (c) Fibrosis (d) Scoliosis
5. Who was the first Indian to win a silver medal in badminton at the Summer Olympics?
   (a) Saina Nehwal (b) P V Sindhu (c) Jwala Gutta (d) Sania Mirza
6. Which of these is an eating disorder in which patients have an obsessive fear of gaining weight?
   (a) Bulimia (b) Amenorrhoea (c) Leukaemia (d) Anorexia

6. TEST AND MEASUREMENT IN SPORTS

Motor Fitness Test

Push Ups (Boys)

Purpose: To measure the muscular strength of arms, upper body and the core.

Procedure: The push-up begins with the hands and toes touching the ground, and the body and legs in a straight line. The feet are kept slightly apart; the arms are at shoulder width apart, extended and at a right angle to the body. Keeping the back and knees straight, the student lowers the body until there is a 90-degree angle at the elbows, then returns to the starting position with the arms extended. The action is repeated until exhaustion or until the time limit is reached. In case of timed tests, the maximum number of correct push-ups performed are noted.

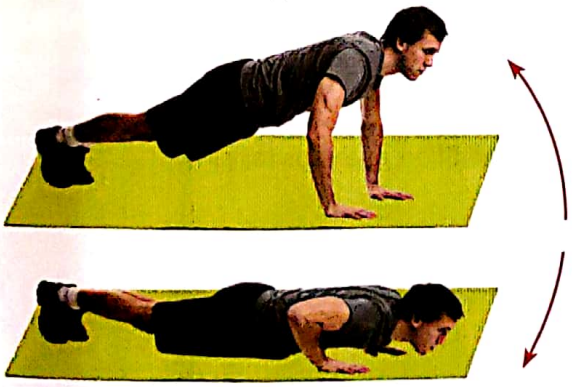

Figure 6.1 Push Ups (Boys)

Modified Push Ups (Girls)

Purpose: To measure the muscular strength of arms, upper body and the core.

Procedure: The push-up begins in a kneeling

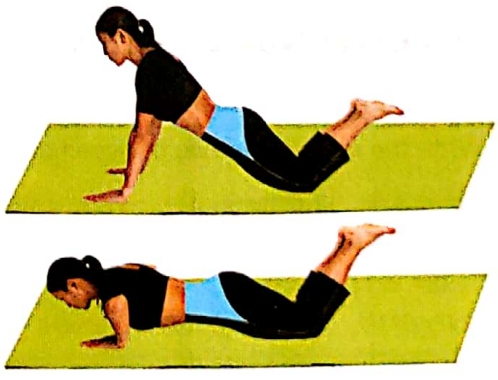

Figure 6.2 Modified Push Ups (Girls)

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position, with the hands and knees touching the ground. The knees are kept slightly apart; the arms are at shoulder width apart, extended and at a right angle to the body. Keeping the back straight and holding the core tight, the student lowers the body until there is a 90-degree angle at the elbows, then returns to the starting position with the arms extended. The action is repeated until exhaustion or until the time limit is reached. In case of timed tests, the maximum number of correct push-ups performed are noted.

EXERCISES

A. Multiple-Choice Questions

1. What aspect of motor ability is the Zigzag Run in the Barrow Three Item Test supposed to test?
   (a) Power (b) Agility (c) Strength (d) Endurance
2. Which of these is a disadvantage of the Harvard Step Test?
   (a) It does not measure cardiovascular endurance.
   (b) It is expensive to execute.
   (c) It is designed only for men.
   (d) It does not account for height and weight differences.
3. Which of these is not one of the variables used in calculating VO_2 max according to the formula for the Rockport Fitness Walking Test?
   (a) Height (b) Weight (c) Age (d) Gender
4. Which of the six tests designed by Rikli and Jones for senior citizens is meant to test speed and balance while moving?
   (a) Arm curl test (b) Chair sit and reach test
   (c) Eight foot up and go test (d) Back scratch test
5. In the Rockport Fitness Walking Test, what is the total distance that an individual has to cover?
   (a) 1 km (b) 1 mile (c) 100 m (d) 1 yard
6. What component of senior citizens' fitness is tested by the Six Minute Walk Test?
   (a) Lower body strength (b) Upper body strength (c) Balance (d) Endurance

B. Very Short Answer Type Questions

1. What is the purpose of push ups (boys) in the motor fitness test?
2. What is the purpose of modified push ups (girls) in the motor fitness test?

C. Short Answer Type Questions

1. What is the procedure of modified push ups for girls?
2. Write the main difference between push ups for boys and modified push ups for girls.

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7. PHYSIOLOGY AND INJURIES IN SPORTS

EXERCISES

A. Multiple-Choice Questions

1. Which of these acids gets accumulated in the muscles during intense physical activity?
   (a) Citric acid (b) Lactic acid (c) Nitric acid (d) Acetic acid
2. Which of these is not a long-term effect of exercise?
   (a) Increase in resting heart rate (b) Increase in the size of the heart
   (c) Increased blood flow (d) Increase in blood volume
3. Which of these terms refers to the air that moves in and out of the lungs with each breath in a normal restive mode?
   (a) Second wind (b) Vital air (c) Tidal air (d) Residual wind
4. Tinnitus, a persistent abnormality prevalent among older adults, is associated with each part of the human body?
   (a) Eyes (b) Lungs (c) Liver (d) Ears
5. In what type of fracture do bones break into three or more pieces, seen often in cycling and motorcycling?
   (a) Oblique fracture (b) Green stick fracture (c) Comminuted fracture (d) Compound fracture
6. Which of these is not one of the three Ps that form the objectives of First Aid?
   (a) Preserve (b) Practice (c) Prevent (d) Promote

8. BIOMECHANICS AND SPORTS

MEANING AND IMPORTANCE OF BIOMECHANICS IN SPORTS

Meaning of Biomechanics

The word 'biomechanics' is an amalgamation of two Greek words: '*bio*' for 'life' or 'living things', and '*mechane*' for 'machine'. It has been defined as the science that deals with the study of the effects produced by internal and external forces when they act on a biological system. In simpler terms, biomechanics looks at the study of forces acting on bodies. Experts have defined it as follows:

"Biomechanics is the study of the structure and function of biological systems by means of the methods of mechanics." – H Hatze

"The study and analysis of human movement patterns in sports is called biomechanics." – Watson

"(Biomechanics is) the science and action of forces, internal or external, on the living body."
– Stedman's Medical Dictionary

In sports, biomechanics has a crucial role both in injury prevention and enhancement of performance. The laws of mechanics are applied to understand the activities and techniques of the players and the implications that mechanics have for human movements. Sports biomechanics use quantitative data for its analyses, obtained through mathematical modelling, measurement, computer simulation, etc. The broad aims of biomechanics in sports are:

- Finding and perfecting new techniques for athletes through quantification of motor abilities.
- Establishing techniques and strategies that allow the athletes to give maximum results with minimum physical exertion.

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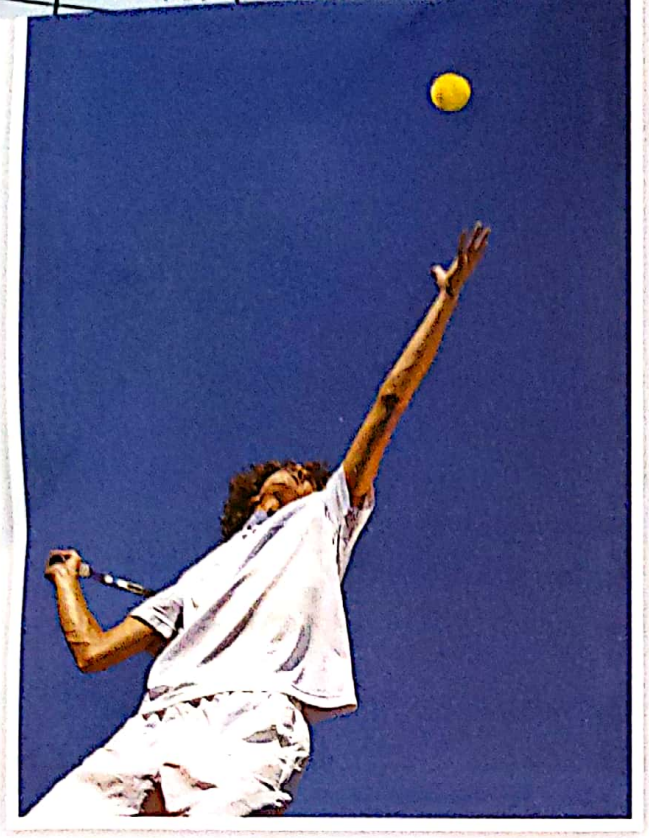

Figure 8.1 Biomechanics helps to describe, explain and predict the mechanical aspects of human exercise, sport and play.

- Evaluation of existing trends and assessing their pros and cons.
- Minimisation and prevention of injury.

Importance of Biomechanics in Sports

A common mistake made by coaches and trainers is the failure to examine the underlying causes of wrong techniques. They correct and train the athletes as needed, but do not attempt to as certain why the latter are unable to perform well in the first place. This is where biomechanics comes in. With detailed analysis of physical movements in sports biomechanics, the flaw can be rooted out from within the source itself.

The importance of biomechanics in sports can be outlined as follows:

Improvement of the Sports Technique: Sports biomechanics constantly try to upgrade and refine sporting trends and techniques for all types of sports. A coach with a good knowledge of the subject is able to guide an athlete achieve a correct mechanical technique to execute in two ways:

1. Corrections of the athlete's performance for better delivery through qualitative biomechanical analysis.
2. Discovery of new and more effective methods through quantitative biomechanical analysis.

Improvement of Equipment and Facilities: Biomechanics has also proved useful in the development of better equipment and facilities with its valuable design inputs. For example, running shoes tailored for races help the athlete reduce injuries and use their energy optimally. Equipment can be *personal* (shoes, clothings, gears, helmets, etc.), *technical* (bats, balls, rackets, wickets, bikes, racing cars and cycles, etc.), *facilities* (gymnasiums, swimming pools, tennis courts, etc.) and *instruments* (heart rate monitors, accelerometer, stopwatch, etc.).

Minimisation of Injury: With the application of biomechanics, it is easier to find scientific rehabilitation of injuries and how they can be prevented in future. It therefore focuses on the safety and well-being of the athletes. Needless to say, physical education teachers, sports trainers and coaches have a duty, which is both professional and moral, to have a thorough grasp of the subject.

Development of New Methods: There are various ways in which data is gathered for a fruitful application of biomechanics in sports: recording videos with Polaroid sequence cameras, taking photographs, etc. They are studied to locate faults in movement patterns and correct them, standardise exercise methods and gauge the physical and motor fitness of the athletes.

Improvement of Training: An important function of the application of biomechanics in sports is the identification of training for specific athletes. Different sports require different techniques and muscular activity. A physical education teacher or sports coach can map out training rules for their athletes according to their particular requirements.

Understanding the Human Body: Anyone engaged in sports ought to be aware of how their bodies function, from the working of the central nervous system to the capacities and limitations of the bones and muscles. Without a background in biomechanics, knowledge will be incomplete and consequently, the training will be lacking.

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EXERCISES

A. Multiple-Choice Questions

1. A decrease in the angle between the femur and the tibia because of the movement of the knee is an example of what type of movement?
   (a) Flexion (b) Extension (c) Abduction (d) Adduction
2. In cricket, the greater the force exerted by the bat on the ball, the higher is the speed with which the ball moves towards the boundary. This is an application of which law of motion given by Newton?
   (a) First law (b) Second law (c) Third law (d) None of these
3. In swimming, a swimmer gets propelled faster in the forward direction if she pushes the water faster in the backward direction. This is an application of which law of motion given by Newton?
   (a) First law (b) Second law (c) Third law (d) None of these
4. Which of these types of friction is stronger than the others given below?
   (a) Rolling friction (b) Sliding friction (c) Static friction (d) All are equally strong
5. Which of these measures is a way to decrease friction?
   (a) Presence of spikes on the soles of football shoes
   (b) Application of chalk powder on the hands and feet by gymnasts
   (c) Use of rough tyres in racing bikes
   (d) Use of narrow boats in rowing

B. Very Short Answer Type Question

1. What is biomechanics?

C. Short Answer Type Question

1. Enumerate the broad aims of biomechanics.

D. Long Answer Type Question

1. Discuss in detail the importance of biomechanics in sports.

9. PSYCHOLOGY AND SPORTS

EXERCISES

A. Multiple-Choice Questions

1. As per the classification of personality by William Herbert Sheldon, which of these temperaments is associated with mesomorphs?
   (a) Cerebrotonia (b) Catatonia (c) Somatotonia (d) Viscerotonia
2. According to the Five Factor Model, which component of personality is associated with irritability, nervousness and emotional instability?
   (a) Extraversion (b) Neuroticism (c) Conscientiousness (d) Openness
3. Which of these is not one of the strategies to enhance adherence to exercise?
   (a) Introducing exercise in a playful manner to children

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(b) Introducing an aspect of competition

(c) Allowing people to exercise whenever they are in the mood to do it

(d) Using social media to create awareness about the benefits of exercise

4. Which one of the following is a correct statement in relation to aggression according to the Instinct Theory?

(a) Aggression is learned through copying the behaviour of others.

(b) Aggression is an inbuilt emotion.

(c) Aggression is a result of prevention from achieving a goal.

(d) Aggression is a result of certain external stimuli.

5. In which of the following cases is an extrinsic source of motivation not involved?

(a) A young swimmer being made to practice everyday by her swimming coach.

(b) A wrestler training harder because he wants to win the Arjuna Award.

(c) A tired marathon runner continuing to run because the crowd is cheering for him.

(d) A sportsman maintaining strict control on his diet.

10. TRAINING IN SPORTS

EXERCISES

A. Multiple-Choice Questions

1. Which of these is an example of an isometric exercise?

(a) Plank hold (b) Push up (c) Running (d) Weightlifting

2. Which of the following is not a categorisation of endurance using nature of the activity as a parameter?

(a) Basic endurance (b) General endurance (c) Specific endurance (d) Speed endurance

3. Milind is preparing for an upcoming marathon by running 400 m distances 15 times every day. Which method for developing endurance is he following?

(a) Continuous training method (b) Interval training method

(c) Fartlek method (d) Pace constant method

4. What type of speed is defined as the ability to maintain maximal speed for maximal distance and maximal duration?

(a) Acceleration ability (b) Locomotor ability (c) Movement ability (d) Reaction ability

5. Which of these components of circuit training is meant to strengthen the upper body?

(a) Bench squats (b) Skipping (c) Pull-ups (d) Bench lift

6. What kind of coordinative ability is defined as the ability to determine the position of the body and its parts in time and space with respect to gravity and moving objects?

(a) Combinatory ability (b) Balance ability (c) Orientation ability (d) Differentiation ability

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