

CASE-BASED/SOURCE-BASED INTEGRATED QUESTIONS

CHAPTER 1 – PLANNING IN SPORTS

1. Praveen practised high jump regularly for over three months. He wanted to win the citywide extramural competition. His efforts yielded results and he won the first prize.
- (a) What is extramural competition?
 - (b) What physical characteristics does a high jumper require?
 - (c) What values did Praveen exhibit?

- Ans.**
- (a) In extramural competitions, participants are from outside as well, *i.e.*, from other schools if it is a school competition, or even from other states and countries depending upon the scale of the competition.
 - (b) A high jumper should possess great muscular strength as well as flexibility and endurance.
 - (c) Praveen exhibited consistency, discipline and hard work with clear focus on achieving his goal of winning the tournament.

2. Mr. Mahesh Sharma is the sports teacher in a well-known high school. He has to organise the Sports Day in his school with the help of other teachers and students.

- (a) What skills are required to organise the Sports Day?
- (b) Why is Sports Day organised in the school?
- (c) What values will students learn by helping organise the Sports Day?

- Ans.**
- (a) To organise Sports Day, one must have the organising and planning capacity and good knowledge of the various sports and events that are to be included. Besides, knowledge about the equipment required, refreshments needed, intimating students well in advance and preparing the schedule of games to be played are other requirements for organising the Sports Day. Leadership quality to motivate students and teachers to participate goes a long way in making the event a grand success.

- (b) Sports days are organised to encourage mass involvement of students. They give students a chance to showcase their skills, learn sportsmanship and the spirit of competition as well as exposure to outdoor games.

- (c) Sports days not only teach the importance of being physically active but also take winning and losing as part of life as well as developing a community-based lifestyle.

3. Your school wants to organise a knock-out cricket tournament as part of an intramural tournament.

- (a) Who can take part in this intramural tournament?
- (b) How is the flow of games decided?
- (c) What values does the winning team demonstrate?

- Ans.**
- (a) All the classes and each section of the class can take part in the intramural competition as there are no outside teams involved.

- (b) The number of matches is always one less than the number of total teams. Thus, in a tournament with 11 teams, a total of ten matches will be played. One team will get a bye and will play from the second round. Each team will play the first match and the losing team will get eliminated. Winners of each round meet the winners of the other rounds in a scheduled pattern till only two teams are left to play the finals and whosoever wins is the winner of the tournament.

- (c) The winning team demonstrates skills and consistency in performance. Besides showing team spirit, they also display fighting spirit and superior sporting abilities. To win, they support and match each other's performance where each department, *e.g.*, fielding and bowling, supports other skills, *e.g.*, batting.

CHAPTER 2 – SPORTS AND NUTRITION

1. In an inter-school debate, the SPG School head boy, Varun, has to speak on nutrition and its importance in sports.

- (a) What are the groups of nutrients he should talk about?
- (b) Of all the macro nutrients, what should he focus on while talking about muscle-building and strength improvement?
- (c) While talking about nutrition, how can he link it to sports performance?

- Ans.** (a) Varun should talk about macro nutrient and micro nutrient diet groups.
 (b) While talking about the three macro nutrient groups, when it comes to muscle-building and strength improvement, he should talk primarily about proteins.
 (c) Nutrition is intrinsic to performance at all levels, especially sports. Muscle strength, endurance and stamina are all directly linked to sports performance. Capacity to perform as well as immunity and recovery from sports injuries depends on good nutrition and he should emphasise that good nutrition is the basis of good sports performance.
2. Ms. Sakshi has to talk about nutrient and non-nutrient components of diet to educate the students in her class.
 (a) How should she explain the two groups of diet?
 (b) Most students of her class believe that they should not eat fat in their diets. What is the correct opinion that she should express and why?
 (c) Students ask that if some component of the diet is non-nutritive, then why take it? What should Sakshi say?
- Ans.** (a) Nutritive components of food supply calories and energy while non-nutritive components do not supply energy or calories but are equally important for regular body function.
 (b) It is a myth that fat is not needed. Fat is an essential macro nutrient and, besides supplying calories and energy, is directly responsible for absorption of fat-soluble vitamins like A, D, and K in the body. So, dietary fat is essential in correct quantities.
 (c) The non-nutritive components of diet, like water, fibre and phytonutrients, may not have calories but these are important for the body to function well. While water is responsible for metabolic reactions and transport of nutrients in the body besides removal of toxins, etc., fibre is cleanser of the system and phytonutrients aid the chemical reactions inside the body.
3. Mr. Pradeep, the school PE teacher, has to talk about why correct body composition is important for performance.
 (a) How should he explain obesity?
 (b) How should he help students evaluate their body composition?
 (c) What measures should he suggest to achieve desirable body composition to high school students?
- Ans.** (a) Obesity is defined as too much body fat using BMI (Body Mass Index) as a method. Indians with a BMI of more than 25 are considered obese. More specifically, it can be measured by body composition analysers where, adult males with over 30% fat and adult females with over 35% fat fall under obesity, irrespective of the body weight.
 (b) Body composition is evaluated using body composition scanners and monitors. These are machines that can measure exact fat component of a person's weight.
 (c) To achieve a good body composition, a proper diet with all the macro nutrients and micro nutrients in proper proportion is suggested. Drinking adequate water and regular exercise are also required as is proper sleep.

CHAPTER 3 – YOGA AND LIFESTYLE

1. As part of the International Yoga Day, school Head Boy, Sunil, has to introduce students to the history and basics of yoga. The Principal has told him to explain to students the connection of yoga to disease and wellness. He has also been told to focus on diseases in general and obesity in particular.
 (a) What are the eight branches of modern yoga?
 (b) What is the role of yoga in preventing diseases?
 (c) Childhood obesity is on the rise. What yogasanas ought to be suggested to help fight obesity especially in teenage students?
- Ans.** (a) The eight branches of modern yoga are yama, niyama, asana, pranayama, pratyahara, dharana, dhyana and samadhi.
 (b) Yoga and the associated asanas can be meditative, relaxive or corrective in nature. Asanas allow practise of yoga for adequate time as well as proper postures and breathing and, hence, promote good health. Thus, regular practise of yoga improves overall health and well-being. Yoga plays a significant role in preventing and moderating modern lifestyle diseases like diabetes, high blood pressure, etc.
 (c) Yoga recommends specific yogasanas to fight and reverse obesity at all ages including teenage obesity. The recommended asanas include Vajrasana, Urdhva Hastasana, Trikonasana and Ardhamatsyendrasana. These are designed to treat and prevent obesity.

2. As part of the World Health Day, your school organised talks by leading yoga experts and teachers. They all focused on the preventive role of yoga in diminishing lifestyle diseases. After hearing this talk, you want to explain to your family members as to why they should take up yoga, especially your mother who is overweight, and your grandfather who always complains of aches and pains.

- What are the important lifestyle diseases where yoga has an important role to play?
- What yogasanas should you demonstrate and encourage your mother to do?
- What can you do to help reduce the lower backache of your grandfather through yoga?

Ans. (a) Diabetes, high blood pressure, backache and asthma are among the lifestyle diseases which yoga has been able to manage. Obesity is a precursor to many such lifestyle diseases and yoga has been of great help not only to fight obesity but also the resultant ill health.

(b) To fight obesity, my mother needs to learn and practise a few specific yogasanas such as Trikonasana, Vajrasana, Pada Hastasana and Ardhamatsyendrasana.

(c) To help decrease lower backache, I will teach my grandfather Tadasana, Ardhamatsyendrasana, Vakrasana, Shalabhasana as well as Bhujangasana and ensure that he practises them regularly.

3. Mr. Acharya, a yoga teacher in a school, is often asked to talk about the preventive aspects of yoga for schoolchildren.

(a) What branch of yoga is he expected to talk about?

(b) What specific advantages will regular practise of yoga offer to his students?

(c) A lot of his young students are suffering from asthma. They seek his help to get some relief from this problem. What are his suggestions to such students?

Ans. (a) Mr Acharya is expected to talk about asanas as a preventive measure and explain to them their benefits.

(b) Yogasanas remove toxins, strengthen the skeletal system and improve blood circulation. Besides, respiratory and excretory systems are made better and digestion improves. So, he should explain to his students the benefits of yoga so that they start practising it on a regular basis.

(c) To provide relief to asthma patients, yoga suggests specific asanas, namely Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottanasana and Matsyasana. He should teach these asanas to his students and suggest them to practise them daily.

CHAPTER 4 – PHYSICAL EDUCATION AND SPORTS FOR ‘DIVYANG’

1. Children with physical disabilities need to be part of regular school sports activities. Physical education is equally important for children with special needs.

(a) When children with special needs study in a school with regular children, what are such schools called?

(b) Why is it important for such children to be encouraged to be physically active?

(c) What special precautions are taken for sporting activities of such children?

Ans. (a) Schools where children with special needs (CWSN) study along with regular children are called inclusive schools.

(b) CWSN need to be encouraged to take part in physical activities as these lead to gains in physical strength, increased flexibility, better bone health, more endurance and better cardiovascular health. Social interactions are also increased.

(c) Special precautions for such children include regular health check-ups and assessment as well as specialised sports equipment. Rules and environment have also to be adjusted to their needs. Better educator training and putting in increased safety regulations are also important.

2. Currently physical education is as important as regular education for all children but more so for children with special needs. Besides enhancing physical abilities, sports offer opportunity for community feeling and socialisation with a wide range of children.

(a) What importance does physical education hold for overall development of CWSN?

(b) How should awareness about physical education be created in such children?

(c) How can inclusive education accelerate learning among such children?

Ans. (a) Children with special needs should be encouraged to be physically active and take part in sports. Physical activities improve physical strength and increase flexibility and result in stronger bones, more endurance and better cardiovascular health. Social interactions are also increased.

(b) A conscious decision to include such children is necessary. Having regular children also taking part with these children helps a lot. Such children should be involved first as spectators and later on gradually as participants, keeping in mind the skills and handicaps. The participation should be enjoyable and fun in order to sustain it.

(c) Seeing regular children support and encourage children with special needs motivates them and makes their participation enjoyable and practical. Also, gradual improvement in such children helps establish confidence among them and builds rapport.

3. A nursery teacher notices that a child is not involving herself in any class interaction. She does not even tell her name or take part in any class activity like painting, singing or dancing. The teacher makes extra effort and encourages the child to which she responds and gradually starts taking part in all class activities.

(a) What disorder can the child be suffering from?

(b) What type of classroom/school is this called?

(c) What are the values exhibited by the teacher?

Ans. (a) The disorder the child seems to suffer from can be mental in origin like sensory processing disorder.

(b) This type of classroom is called inclusive as regular children study along with children with special needs.

(c) The teacher is compassionate and caring and treats all students equally while giving special attention to the deserving. The teacher is kind and observant and willing to make an extra effort to get the child going.

CHAPTER 5 – CHILDREN AND WOMEN IN SPORTS

1. Anil is a Physical Education teacher in a high school where most children shy away from taking part in sports. They do not have any interest in physical education classes and lack confidence.

(a) What should Anil tell students about the benefits of sports?

(b) What should he explain about sportsman spirit?

(c) How do sports help develop skills?

Ans. (a) He should explain to the children the various benefits of sports like a healthy body and toned physique. Participation in sports helps them develop motor and social skills besides developing sportsman spirit.

(b) Sportsman spirit is the ability to take both victory and defeat with grace. Winning develops confidence but losing should not lead to a sense of failure and lack of confidence.

(c) Sports help us develop motor as well as social skills. Both gross motor skills like running and climbing as well as fine motor skills like holding the racquet or bat, etc., are developed. Besides meeting new people helps us develop interpersonal and social skills like travelling as a team, visiting different places and learning about different cultures.

2. Geeta wanted to learn boxing but her family was opposed to it. Then her father spoke with her Physical Education teacher who supported Geeta and she won a medal at the school championship.

(a) What mindset did Geeta's family show initially?

(b) What values were shown by her father?

(c) What values were demonstrated by the school teacher?

Ans. (a) Geeta's family showed gender discrimination as she wanted to take part in a sport which is male-dominated.

(b) Her father showed values of gender equality, confidence in his child and open-mindedness as he let her decide her own course.

(c) The school teacher showed progressive thinking and right values of treating every individual equally, selecting students on the basis of their performance and not gender. He exhibited good skills in training her, believing in her and giving her an opportunity to do well in her chosen sport.

3. Many children suffer from postural deformities. These can be corrected if recognised early and treated properly. Mahesh had a deformity in his spine which caused him to bend forward and his knees touched each other while he stood straight.

(a) What are spine deformities and what are their types?

(b) What was the possible deformity Mahesh had and how can it be corrected?

(c) What was his possible knee problem?

Ans. (a) There are three types of deformities of the spine which can either be since birth or can develop later. These are called kyphosis, scoliosis and lordosis. In kyphosis, the spine is bent forward while in scoliosis, it has a side-to-side curve. The spine has an abnormal curve to the front in the case of lordosis.

(b) Mahesh seems to have kyphosis which is also called hunchback. It could be by birth or may happen later. Remedies depend on the cause but many developmental kyphosis can be corrected by ensuring proper posture while sitting or working. Regular exercises, Dhanurasana and having good nutrition and adequate rest to strengthen the muscles prove beneficial. In extreme cases surgery may be needed.

- (c) The commonest condition where the knees touch each other while standing is called knock knees. This can be corrected in most cases by taking adequate calcium and vitamin D as well as proper diet. Asanas such as Padmasana and Gomukhasana help and in extreme cases surgery may be required.

CHAPTER 6 – TEST & MEASUREMENT IN SPORTS

1. Amar saw his grandmother bending forward to find her medicine that had slipped out of her hand. She was unable to bend enough to look for the tablet but Amar swiftly bent under the table, located the tablet and gave her a glass of water to have her medicine.
- What values did Amar depict in the above paragraph?
 - What deficiency does Amar's grandmother likely have?
 - What test can be done to determine her disability?

- Ans.** (a) Amar's action shows that he is sensitive and caring towards his elders, understands their physical limitations and is compassionate.
- (b) Amar's grandmother is likely to have limitation of flexibility in her body, especially in the back and lower body.
- (c) To measure her lower body flexibility, we can perform a test on her called the chair sit and reach test. In this test, she sits on a chair which is placed against a wall with both her hands placed on top of each other. She will bend forward to touch her toes on the outstretched leg and depending on her reach, we can measure her lower body flexibility.

2. Sonia wants to undertake a series of physical activities to check her fitness but is unable to do push-ups even with the support of her knees. She was advised by her sports teacher to prepare herself by properly warming up before attempting any exercise and understand that this was only one of the six tests she needed to undertake.
- What is the test called that Sonia is undertaking?
 - What other tests will she need to undertake besides the push-ups?
 - What values does the teacher exhibit in correcting and encouraging Sonia?

- Ans.** (a) Sonia is undertaking the motor fitness test.
- (b) Sonia will need to take part in a series of seven tests. These include 50-metre standing start, 600-metre walk or run, sit and reach test, partial curl-up test, modified push-ups, standing broad jump and agility 4x10 mt. shuttle run.
- (c) The teacher exhibits values of commitment to training to achieve excellence. The teacher is also a good motivator and cares for the success of students.

3. A group of senior citizens approaches an instructor to evaluate their fitness. He explains to them that he would like them to undergo a series of simple tests advised for senior citizens.
- What are these tests known as?
 - How many tests are required to be performed by these senior citizens?
 - What tests will these senior citizens be required to undergo?

- Ans.** (a) The tests for checking fitness of senior citizens are known as Rikli and Jones test.
- (b) Rikli and Jones is a series of six tests.
- (c) The tests that senior citizens undertake to check their physical fitness are: Chair Stand Test, Arm Curl Test, Chair Sit and Reach Test, Back Scratch Test, 8-foot Up and Go Test and Walk Test for 6 minutes or Step in Place Test for 2 minutes.

CHAPTER 7 – PHYSIOLOGY AND INJURIES IN SPORTS

1. After being struck by a fast ball on his head, a famous batsman got injured and went into coma. He was rushed to a hospital but in spite of the best efforts of the doctors, he passed away.
- What protective gear worn by the batsman would have helped avoid this?
 - What first aid ought to have been administered on the field?
 - What is the role of protective gear in modern sports?

- Ans.** (a) Head helmet, if worn by the batsman, would have possibly prevented the injury.
- (b) Immobilising the neck if a splint was available and applying ice to the bleeding site should have been done. Excessive movement is to be avoided and immediate shifting to the hospital by trained staff is to be arranged.

(c) Modern sports involve high speeds and often sharp implements and possibility of high speed collisions. Adequate sport protective gear can be life-saving. This can range from wearing pads, gloves and helmets in cricket to seat belts and helmets in speed cars as well as gear that offers protection to vulnerable parts in sports like fencing and sword fighting. Horse-riding demands special boots and well-fitted clothes while in games like polo, players wear gear that protects them during high speeds.

2. In peak summer while a hockey match was in progress, one of the players fell down and became unconscious. He was soaked in sweat and was looking red hot and flushed. He had very high pulse and his body had become quite warm. His teammates shifted him to a shade, put cold water on him and called an ambulance.
- What was possibly wrong with the player?
 - What first aid was administered to the player?
 - What values did his teammates exhibit?

Ans. (a) The player seemed to have suffered a heat stroke.

(b) The player was shifted to a shaded area, which was right. In such cases, after shifting the sufferer to a shaded place, ice or cold water should be liberally applied to bring down the body temperature. Tight clothing must be removed and, if possible, cold liquids with electrolytes should be given to drink till proper medical aid arrives.

(c) The teammates showed presence of mind by shifting him into the shade and applying cold water on him. Also, they showed care and compassion towards their teammate as well as knowledge of first aid.

3. During a seminar on sports injuries, a Physical Education teacher was asked why it was important to know about them and why students should have awareness of handling them till medical aid arrives.
- What is the procedure of offering help to an injured on the field known as?
 - What steps are suggested to prevent on-field sports injuries?
 - In case of acute sprains, RICE treatment is advised. What does it mean?

Ans. (a) The procedure of offering immediate help to an injured player is known as First Aid.

(b) Use of protective gear, ensuring proper warm-up before the games, correct equipment as well as physical fitness for the sport are important to prevent sports injuries. Proper nutrition and adequate hydration play an important role in avoiding injuries on the sports field.

(c) RICE stands for Rest, Ice, Compression and Elevation. This is the standard first aid applied to muscle and ligament injuries.

CHAPTER 8 – BIOMECHANICS AND SPORTS

1. Abhishek, the Class 12 monitor, was asked to speak on different types of movements possible in human body and their importance.
- How many basic types of movements would Abhishek talk about?
 - What movements that he demonstrated were possible at the shoulder joint?
 - He demonstrated dorsiflexion and plantar flexion movements. At what joints do these take place and what do these terms mean?

Ans. (a) Abhishek would have talked about the four basic movements, namely flexion, extension, abduction and adduction. Rest of the movements at different joints are combinations of these four basic movements.

(b) The movement that Abhishek would have specifically demonstrated at the shoulder is called circumduction where the shoulder swings through a 360 degree circle. This is the maximum range of movement possible at any joint.

(c) Dorsiflexion and plantar flexion are movements that take place especially at the ankle joint. While in dorsiflexion, the ankle moves upwards towards the body; in plantar flexion, the ankle moves towards the ground.

2. While talking about Newton's laws of motion and their application in sports, a Physical Education teacher gave examples from cycling, swimming and cricket.

(a) How many laws did Newton describe?

(b) What law applies to cyclists and how?

(c) What law is in force when the swimmer pushes off the wall of the swimming pool to start the race?

(d) What law is in play when the ball is hit by the batsman?

- Ans.** (a) Newton described three laws.
 (b) Cyclists use the first law of motion, also known as the law of inertia. While cycling, the cyclists only move when they start to pedal and stop only when they apply brakes.
 (c) While pushing against the wall of the swimming pool, the swimmer brings into play the second law of motion, also known as the law of acceleration. This permits the swimmers to use the wall of the pool to generate the force needed to take off.
 (d) Newton's third law, namely the law of reaction, is used by batsmen as they offer opposition to an incoming ball by using the bat to hit it in the opposite direction.
- 3.** Friction is both an advantage and a disadvantage in sports.
 (a) What is friction? How many types of friction are there?
 (b) How is friction an advantage in sports and where is it practically applied?
 (c) What disadvantage does friction offer to a sports person? Explain using a few examples.
- Ans.** (a) Friction is the force that resists the relative motion between two surfaces. There are two types of friction, namely static and dynamic. Static friction keeps the object at rest while dynamic friction occurs when the two objects are moving.
 (b) Friction is of advantage at many places in sports. Using spikes in footwear in sports like football and cricket helps use friction as a stabilising force. Gymnasts and carom players use dusting powders to generate friction to optimise performance and improve control. Similarly, badminton rackets have rough grip to improve hold.
 (c) Friction is disadvantageous in sports like cycling and car racing. More the friction, more is the effort required to generate speed. Too much friction can cause tyres to burst during car racing and cause accidents. Skiers also slow down because of friction, thus hampering their speed.

CHAPTER 9 – PSYCHOLOGY AND SPORTS

- 1.** Bhupinder is the star bowler for his school cricket team. For the last six matches, however, he has not been able to take even a single wicket. This has caused him stress and he approaches his coach for a solution.
 (a) What sort of motivation will the coach offer?
 (b) How will the coach help Bhupinder improve his focus?
 (c) What activities will the coach suggest for Bhupinder to de-stress?
- Ans.** (a) Bhupinder will get extrinsic motivation—praise, grades, money, etc., and support from his coach.
 (b) The coach will review his performance, point out his weak points while showing full faith in Bhupinder's capacity to return to form after adequate rest and will pay attention to his nutrition and hydration. The coach will also explain the role of warming up and cooling down to get optimum results.
 (c) Taking a few days off, getting adequate rest and rehabilitative exercises, if needed, will be suggested by the coach. He will also be advised to spend time with friends and family and focus on gradual supervised return to activity. Playing some other game as a form of relaxation is also a good suggestion the coach will make.
- 2.** Nupur is an individual who is very competitive in all she does. She is impatient to achieve success and works on multiple projects at the same time. She often pushes herself to the breaking point to achieve her goals. She is told by her coach that she has a specific type of personality.
 (a) What type of personality do these traits classify Nupur into?
 (b) How many types of other personalities do people exhibit as per this classification?
 (c) What can be the health challenges people with such personalities face?
- Ans.** (a) Based on her personality traits, Nupur has Type A personality.
 (b) This classification puts people into four types, namely A, B, C and D.
 (c) Insecurity and pushing oneself to the breaking point are indicators of this personality and lead to ill health, anxiety and nervous breakdown as well as chronic fatigue.
- 3.** Success depends on how motivated one is and the efforts they are willing to put in to get to their goals. Many times, however, in spite of sincere efforts, one needs support from outside to succeed. The theory of self-reliance has wide support among personality trainers.
 (a) What are the two types of motivation as per theory of self-reliance?
 (b) Trying to do well with our own thought process is what type of motivation?
 (c) Do outside forces play any role in motivating us?

- Ans.** (a) The two types of motivation as per the self-reliance theory are intrinsic motivation and extrinsic motivation.
 (b) This is called intrinsic motivation and comes from within a person. There is no external pressure to perform in this type of motivation.
 (c) Yes, outside forces are important motivators. These are called extrinsic motivation and most of us need them in our day-to-day life. Aiming for rewards and prizes is an example when outside forces encourage us to do better.

CHAPTER 10 – TRAINING IN SPORTS

1. Sameer was a very good sportsperson. He wanted to be a marathon runner and asked his Physical Education teacher for his advice on how to become one.
 - (a) What strength did his coach suggest him to develop?
 - (b) What factors contribute to developing these strengths?
 - (c) What types of exercises would the PE teacher suggest to Sameer?
- Ans.** (a) Like all marathon runners, Sameer needs to develop muscle strength but, more importantly, long-term muscle endurance.
 (b) Proper nutrition, adequate hydration, training to develop muscle strength and long-term endurance and stamina are a must for Sameer.
 (c) To achieve this, the coach will suggest continuous training methods along with periods of interval training including fartlek training as well. Care will be taken to ensure proper footwear, correct diet and adequate rest, and time for the muscles to recover and repair.
2. Developing endurance is vital to any sportsperson who wants to take part in any sport which takes time to compete in and complete.
 - (a) What sports are focused on endurance?
 - (b) What type of training methods will be used by the coach to develop endurance?
 - (c) A training to improve endurance was developed in Sweden. What is it called and what does it consist of?
- Ans.** (a) Any event lasting over 11 minutes in athletics needs long-term endurance. Thus, races of 5,000 metres, 10,000 metres, cross-country runs, triathlons and marathons are sporting activities that need long-term endurance.
 (b) Three prominent methods used to develop endurance are continuous training, interval training and fartlek training. In continuous training, prolonged running at a steady pace for a long time is encouraged. In interval training, intense activity for 30 seconds is followed by about 4 minutes of less intense workout. Fartlek method is based on distance running with bursts of harder running at irregular speeds, distances and intervals with varied activity like walking, sprinting, steady running uphill, etc.
 (c) Fartlek training was developed in Sweden as a method to build up endurance. Here, the athlete warms up for, say, 5 minutes, then runs at a speed for about 2 km, slows to a rapid walk for 5 minutes and then mixes sprints for one minute with easy running in between. This is repeated for many cycles for a fixed time, which is usually 45 minutes.
3. Speed is of essence to any activity, especially in many competitive sports. A coach was asked to help his athletics class develop this particular feature.
 - (a) How is speed defined with reference to sports?
 - (b) What types of speed are defined?
 - (c) How does an athlete develop speed?
- Ans.** (a) For the purpose of sports, speed is defined as the ability to move quickly across the ground or to move the limbs rapidly to grab or to throw.
 (b) There are five different types of speed described in sports. These are Reaction ability, which is the speed of response to a signal; Acceleration ability, which measures the ability to pick up speed from stationary position; Movement speed, which measures ability to perform body movements; Loco motor ability, which helps generate top speeds for long periods of time; and Speed endurance, which permits sustained speed in spite of fatigue.
 (c) Speed is developed by an athlete by practising either acceleration runs or pace runs. In acceleration runs, the athlete starts with jogging and increases it to sprinting through striding. In pace runs, a specific distance is run at a constant pace.