Training and Doping in Sports

PART 1

Objective Questions

• Multiple Choice Questions

1. Which period of training comes after competition?

(a) Preparatory (b) Competition
(c) Transitional (d) Technical

Ans. (c) Transitional period of training comes after competition. In this period, player gets recovery time and maintains physical ability for the next competition.

2. What is the full form of 'WADA'?

(a) White Anti-doping Agency
(b) Wide Anti-doping Academy
(c) World Anti-doping Agency
(d) None of the above

Ans. (c) The full form of WADA is World Anti-doping Agency. It was formed in 1999. It defined doping as "the occurrence of one or more of the anti-doping rule violations set forth in Article 2.1 through Article 2.8.

3. Women who take ....., tend to develop muscular bodies.

(a) Beta-blockers (b) Amphetamines
(c) Diuretics (d) Steroids

Ans. (d) Women who take steroids, tend to develop miscular bodies. Steroids are drugs that stimulate the growth of muscles.

4. Which of the following is the performance enhancing substance or method?

(a) Blood doping (b) Gene doping
(c) Narcotics (d) Autologos doping

Ans. (c) Narcotics is the performance enhancing substance. Blood doping, gene doping and autologos doping are physical methods of enhancing performance.

5. Alcohol stimulates the

(a) Muscular system (b) Digestive system
(c) Nervous system (d) Excretory system

Ans. (c) Alcohol stimulates the nervous system. Due to its consumption, brain and nerves become weak, neuromuscular coordination decreases and reaction time of such individuals increases.

6. Match the following

	List I		List II
A.	Adrafinil	1.	Peptide hormone
B.	Erythropoietin	2.	Narcotics
C.	Dextran	3.	Stimulant
D.	Pethidine	4.	Diuretics

Codes

	A	B	C	D
(a)	3	1	4	2
(b)	4	2	3	1
(c)	2	3	1	4
(d)	1	4	2	3

Ans. (a) The correct match is A-3, B-1, C-4, D-2.

7. Match the following.

	List I		List II
A.	Anabolic Steroids	1.	Nervous system
B.	Cannabinoids	2.	Endocrinal changes
C.	Alcohol	3.	Heart diseases
D.	Beta-2 Agonists	4.	Diabetes

Codes

	A	B	C	D
(a)	4	1	3	2
(b)	4	2	1	3
(c)	2	3	1	4
(d)	1	4	2	3

Ans. (c) The correct match is A-2, B-3, C-1, D-4.

8. The use of doping first came out in _____.
(a) 1906 (b) 1904 (c) 1912 (d) 1940

Ans. (b) The use of doping first came out in 1904.

9. Joy, a boxer initially started taking certain drugs in small amount to increase his muscle power. But after some time, his body got a habit of it and now he takes it daily.

What should a doctor at medical camp suggest Jay?
(a) Rapidly reduce stimulants intake.
(b) Slowly reduce stimulants intake.
(c) It is impossible to leave this habits.
(d) Given away sports.

Ans. (b) Doctor at medical camp suggest jay to slowly reduce stimulants intake. Regular intake of stimulants makes it a habit. The habit should be reduced slowly by decreasing its intake.

10. Stimulants such as caffeine, amphetamines, ephedra, cocaine etc. act on the central nervous system and improves the performance artificially. This affects athletes health adversely.

How stimulants impact the performance of a sportsperson?
(a) It reduces stress.
(b) It removes tiredness.
(c) It increases blood pressure.
(d) All of the above

Ans. (c) The stimulants have a direct effect on the cardio vascular systems as they increase the heart rate thereby increasing the blood pressure.

11. You have noticed your friend using sports enhancing drugs for winning sports competitions. He says that he needs it for stimulation as winning the competition is very important for him. To explain him the side effects of taking drugs, select the best option from the following.
(a) They are good pain killers.
(b) They increase muscle mass.
(c) They cause hyper tension.
(d) They reduce anxiety.

Ans. (c) Stimulants raise the blood pressure and cause hyper tension which is an ill effect. Other options increase in muscle mass, reducing anxiety are positive.

• Assertion and Reasoning

Directions (Q. Nos. 1-4) *Each of these questions contains two statements, Assertion (A) and Reason (R). Each of these questions also has four alternative choices, any one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.*

Codes
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true

1. **Assertion** (A) Sports training is planned and controlled process.

Reason (R) Training is essential in the field of sports and physical education.

Ans. (b) The Assertion is true as sports training means proper planning, preparation of the process and a controlled way of practising.

Reason is also true as training is the first and the most essential step in the field of sports and physical education. It enhances sports performances. Thus, Both A and R are true, but R is not the correct explanation of A

2. **Assertion** (A) Stimulants are considered as drug.

Reason (R) Gene doping is physical method of doping.

Ans. (b) The Assertion is true as stimulants enhance alertness and physical activity so they are considered as drug.

Reason is also true as Gene droping is when cells or genes are manipulated for enhancing sports performance. But reason do not explains assertion. Thus, Both A and R are true, but R is not the correct explanation of A.

3. **Assertion** (A) Cannabinoids are banned from sports competitions although they give relief from fatigue and pain.

Reason (R) This practice boosts red blood cells raising the capacity of blood to carry oxygen therefore cannabinoids are banned.

Ans. (c) Assertion is true as Cannabinoids like Hashish and Marijuana are banned from sports competition. They cause a feeling of relaxation and pain relief. The reason is false as red blood cells are boosted by the physical method of blood doping while cannabinoids are performance enhancing substances. Thus, A is true but R is false.

4. **Assertion** (A) Principal of reversibility tells how adjustments based on individuals should be done.

Reason (R) The overload should not be increased too slowly or too rapidly as it may result in injury or muscle damage.

Ans. (d) The assertion is false as principle of reversibility provides guidance about detraining when athletes stop working out.

The reason is true as overloading of training exercises should not increased too slowly or too rapidly to avoid any related injuries. Thus, A is false but R is true.

• Case Based MCQs

1. Prakash is the coach for the school Basketball team. During training sessions, he noticed that some players could continue exercises without fatigue for longer periods than others while some players have faster reaction time. He then split the students and gave different exercise and training schedules. Based on this case, answer the following question

(i) Which principle of sports training is observed by Prakash?
(a) Principle of balanced training
(b) Principle of Specificity
(c) Principle of Individual differences
(d) Principle of progression

Ans. (c) Prakash observed the principle of individual differences which states that response to exercise and training is different in everyone due to individual differences.

(ii) Which principle of training means that training sessions should consist of many variables?
(a) Principle of active involvement
(b) Principle of variation
(c) Principle of reversibility
(d) Principle of overload

Ans. (b) Principle of variation or variance means that training must be planned with different challenges and variables.

(iii) The principle of recovery means which of the following?
(a) Rest is important
(b) Training is continues process
(c) Intensity of workloads
(d) None of the above

Ans. (a) Principle of recovery means rest is important as rest is always required for the body to recover from exertion of training.

PART 2
Subjective Questions

• Short Answer (SA) Type Questions

1. Define sports training? Enlist the principles of sports training.

Ans. Training in sports means the preparation of a sportsperson based on the scientific principles for giving the highest level of performance. It is a specialised process of all-round physical strengthening aimed at improving an athlete's fitness in a selected activity.

The principles of sports training are
- Balanced training
- Individual differences
- Reversibility
- Specificity
- Progression
- General and specific preparation
- Active involvement

2. What are two reasons for the requirement of an effective training programme in sports? What is the result if they are not conducted?

Ans. Two reasons for the requirement of an effective training programme in sports are as follows

(i) Producing skillful high performers for success in major international competitions.

(ii) Development of healthy participants.
If such training programmes are not conducted, a sportsperson's potential will never be fulfilled. They will not be able to develop the skill and competitive edge needed to win a sports event. The sport persons will be weak in physical, technical, tactical and psychological preparation needed in winning a sports competition.

3. Explain any three principles of sports training.

Ans. Three principles of sports training are as follows

(i) **Principle of Balanced Training** It concerns achieving the right proportions between training activities and rest. It also relates to the body's tendency to return to normalcy or **homeostasis**.

(ii) **Principle of Individual Differences** It concerns adjustments in training based on differences between individual sportspersons.

(iii) **Principle of Overload** It provides guidance about intensity of workloads and increasing the workload after the body has adapted to the previous load.

4. Explain the three phases of preparatory period in sports training.

Ans. Preparatory period is the basic training program where stress is given on developing fitness and skill needed for sports competitions. The three phases of preparatory period are as follows

- **Phase I** This phase consist of programs that develop speed, strength, endurance. This phase includes 6-12 weeks of practice. Training of weight lifting, running and circuit training comes in it.

- **Phase II** This phase focus on mastery of advanced skills. It includes 4-8 weeks of practice and various techniques of specific games are introduced in this phase.
- **Phase III** This phase develops the tactics and strategies to be used under tough situations and consist of 2-5 weeks of practice.

5. What is Principle of Variation? How it enhances sports training?

Ans. The Principle of Variation provides direction about variations in exercises, rest time, intensity and other variables. It means to include a number of different activities and exercises in the training program to maintain the interest and motivation of the athlete. This can be done by changing the nature of exercise, increasing the time of each session, changing the group and environment, etc.

As training occurs over a long period of time, it tends to become boring for both the sportsperson and the coach.

Varying the training programmes helps in maintaining the interest of the sportsperson. Further, introduction of new activities and including fun games into the session can prevent problems such as plateaus in performance and overtraining effects.

6. "Doping has been a part of the field of sports since time immemorial". Justify the statement.

Ans. Doping refers to the use of drugs to enhance physical performance. The concept of doping is not new in sports.

In ancient Greece, there were specialists who would offer nutritional ingredients such as mushrooms, opium and other herbal beverages that enhanced sports performance.

Even Gladiators are known to use various substances that aimed at enhancing strength.

In the modern times, the use of doping first came out in 1904 Olympics, when Thomas Hicks won the marathon race. He had taken injections of strychnine.

After that, the increase in doping increased so much that in 1928, the International Athletic Association Federation banned doping followed by other doping federations.

Soon, the International Olympic Committee started considering the "presence of substances in the human body which are prohibited according to the list published by the IOC and/or the international organisation" as illegal.

Hence, it can be said that doping has been a part of the field of sports since time immemorial.

7. Elaborate the anti-doping rules of sport.

Ans. Anti-doping rules of sport are as follows

- The presence of prohibited substances and methods.
- Use or attempted use of a prohibited substance or prohibited method by an athlete.
- Refusing or failing to submit sample collection after notification by the authority.
- Possession of prohibited substances or prohibited methods.
- Tampering or attempting to tamper with any part of the doping control process.
- Trafficking or attempted trafficking in any prohibited substance or prohibited methods.
- Failure to inform an athlete's whereabouts after being notified.
- Administering, or attempting to administer a prohibited substance or method to an athlete.

8. Discuss the effects of stimulants both beneficial and harmful.

Ans. Stimulants are a class of drugs that stimulate the body's central nervous system which include the brain and spinal cord. They have, both beneficial and harmful effects like enhancing alertness and physical activity by increasing heart rate, breathing rate and the functions of the brain.

They stimulate both physically and mentally by reducing the feeling of fatigue and enhancing aggressiveness.

The harmful effects of stimulants increase in hypertension, anxiety and even respiratory paralysis and cardiac arrest.

Stimulants also has many toxic effects like they increase aggression and violent behaviours, cause dizziness, blurred vision and irregular heartbeat. They also cause addiction and increase dependance which can lead to intake of high doses of stimulants.

9. What do you mean by a prohibited substance? State the effects of using Betablockers and Peptide Hormones.

Ans. Substances which are not allowed to be used in sports by any sportsperson are known as prohibited substances. The use of these substances is illegal. Therefore, World Anti-doping Agency (WADA) has issued a list of prohibited substances.

The effect of using Betablockers is to relax the muscles of the airway to allow more oxygen to come in during respiration, which increases endurance. They also reduce blood pressure and heart rate in heart patients.

The effects of using Peptide Hormones are increase in muscle bulk, strength and oxygen-carrying red blood cells. However, they interfere with the working of estrogens (i.e. female hormones).

10. What constitutes manipulation of blood and blood components, according to WADA?

Ans. According to WADA, manipulation of blood and blood components includes

- Administration or reintroduction of any quantity of autologous, homologous or heterologous blood, or red blood cell products of any origin, into the circulatory system.

- Artificially enhancing the uptake, transport or delivery of oxygen through haemoglobin-based blood substitute products, but not including supplemental oxygen by inhalation.
- Any form of intravascular manipulation of the blood or blood components by physical or chemical means.

11. Explain the side effects of Cannabinoids, Glucocorticoids and alcohol.

Ans. (i) **Cannabinoids** They lead to a drop in physical performance and affect short-term memory. High doses cause anxiety, panic, restlessness and confusion. They also reduce the concentration and coordination power and can cause heart and lung diseases.

(ii) **Glucocorticoids** They affect the immune system which leads to decrease in bone density (osteoporosis) hence increasing the risk of injury.

(iii) **Alcohol** The consumption of alcohol leads to impairment of the thinking process. It can cause respiratory paralysis leading to death. Alcohol addiction damages the cells of the body, affecting the nervous system and liver.

12. List the substances that are banned in sports competitions but otherwise can be taken?

Ans. Many substances are banned or prohibited only at the time of competitions. They are as follows

(i) **Stimulants** Stimulants such as caffeine, amphetamines, ephedra, cocaine, etc. act on the central nervous system and improves the performance artificially. Hence, they are banned in competitions.

(ii) **Narcotics** Narcotics such as morphine and oxycodone are not allowed during competitions.

(iii) **Cannabinoids** These substances such as hashish, mariyuana, etc. induces relaxation artificially and hence are banned during all competitions.

(iv) **Glucocorticosteroids** Some pain relievers such as betamethasone, budesonide, cortisons, etc. are banned from all competitions.

13. Write a short note on blood doping.

Ans. World Anti-Doping Agency (WADA) defines blood doping as the misuse of certain techniques or substance to increase one's red blood cell count, which allows the body to transport more oxygen to muscles and therefore increase stamina and performance.

The method used in it includes taking out some blood from an athlete a few weeks before competition, freeze and store it till one or two days before the competition and then inject the blood back into the athlete.

This practice boosts red blood cells, raising the capacity of the blood to carry oxygen, thus enhancing the performance of the athlete.

14. Differentiate between autologous and homologus blood doping.

Ans. The difference between autologous and humologus are as follows

Autologous Blood	Homologous Blood
Autologous blood doping is when blood from an athlete is taken out, frozen and stored a few weeks before the competition.	Homologous blood doping is when fresh blood of another person is injected into the body of an athlete.
It is again injected one or two days before the competition. This boosts the red blood cells in the body and enhances performance.	This also increases red blood cells in the body and enhances performance.
In autologus own blood is used.	In homologous blood of some other person is used.

• Long Answer (LA) Type Questions

1. Explain in brief the meaning and concept of sports training.

Ans. Training in sports means the preparation of a sportsperson based on the scientific principles for giving the highest level of performance.

It is a specialised process of all round physical strengthening aimed at improving an athlete's fitness in a selected activity.

Training is a long term, systematic and a continuous process that recognises an individual's needs and capabilities to develop exercises based on scientific knowledge that enhances sports performances.

It develops basic and advanced skills, techniques, tactics, strategies, etc. for all sports activities and competitions.

Sports training is a concept whose practice is spread over many years. Training method for a particular sport consists of training periods which are split into sessions and schedules.

These sessions and schedules are progressive in nature and training continues till mastery over a skill is achieved.

All training programs are divided into three parts. These are as follows

(i) **Preparatory Period** This is the basic training program wherein stress is given on basic fitness and skill for competitions.

(ii) **Competition Period** In this period, the player achieves its top form and can participate in competitions to achieve top performance.

(iii) **Transitional Period** This period comes after the competition. In this period, a player relaxes and rests to recover from stress.

2. List five major categories of performance enhancing substances used by sports persons and explain their effects in one sentence each.

Ans. The categories of performance enhancing substances used by sportspersons are as follows

(i) **Stimulants** They enhance alertness and physical activity by increasing heart rate, breathing rate and the functions of the brain, besides reducing the feeling of fatigue and enhancing aggressiveness.

(ii) **Narcotics** They are used to relieve pain and discomfort which could arise from muscle strain or an injury, reduce anxiety and help in making persistent efforts for a longer time.

(iii) **Beta-2-Agonists** These drugs relax the muscles of the airway to allow more oxygen to come in during respiration, which increases endurance.

(iv) **Anabolic Steroids** They stimulate the growth of muscles and help athletes to train harder and recover quickly.

(v) **Diuretics** They reduce weight rapidly by removing body fluids such as water and are also used as masking agents for removing other doping substances.

3. Describe briefly about the substances prohibited by WADA. Also explaining the reason for prohibiting them.

Ans. WADA has classified the prohibited substances into following categories

(i) **Anabolic Steroids** Anabolic steroids such as drostanolone, matenolone, oxandrolone, etc. are prohibited as they enhance the performance of an athlete artificially and have serious side effects.

(ii) **Peptide Hormones** Peptide hormones such as erythropoietin, human growth hormone, insulin, etc. are banned as they artificially increase the muscle and produces excess red blood cells.

(iii) **Beta-2-Agonists** Substance that are generally prescribed for asthma patients, are prohibited in all sports.

(iv) **Diuretics** All diuretics and masking agents are banned in and out of all competitions for giving athletes an unfair competitive edge.

(v) **Hormones and Metabolic Modulators** Any substances that interfere with the function of hormones such as tamoxifen and clomiphene are banned from all sports.

4. What are the side effects of any five prohibited substances?

Ans. Five prohibited substances with their side effects are as follows

(i) **Anabolic Steroids** Overdose of steroids can have serious side effects inducing the risk of cardiovascular disease, liver diseases and many behavioural changes.

It affects the endocrine systems and brings many physical changes. In males, developments such as enlargement of breasts happen, while in females, facial hair is commonly seen.

(ii) **Beta-2-Agonists** Their side effects are excessive sweating, restlessness, rapid heartbeat, etc. They also have some other side effects like reduction in potassium concentration in the blood serum and increase in glucose level in the body.

(iii) **Hormone and Metabolic Modulators** They interfere with the body's endocrine system and enhance the risk of serious diseases. They also slow down some enzyme reactions causing of flushes, excessive sweating and loss of sleep.

(iv) **Narcotics** They cause problems in coordination and concentration. Overdoes of narcotics may lead to fatal respiratory paralysis. It can also cause a false sense of security and invincibility which is very fatal.

(v) **Diuretics** They disrupt the balance of water and salt in the body. This can lead to muscle cramps, acute hypertension and circulatory shock. Other side effects are gastrointestinal and kidney problems.

• Case-Based Questions

1. Karan is an athlete. He completed the 400 m relay race, which he won. But after the decleration of the result, he was disqualified for doping charges. Based on this case, answer the following questions.

(i) What do you understand by doping?

Ans. Doping means the use of drugs in the field of sports to enhance the physical capacity of the Athletes. It improves sports performance.

(ii) What are the two methods of doping?

Ans. The two methods of doping are taking performance enhancing substances and altering the body by injecting or manipulating cells or genes.

2. In the preparatory period, there are three phases in which the players achieve their physical fitness and skill efficiency needed for the competitions. They are preparatory, competition and transitional period. The preparatory period also has three stages.

(i) Which period of training is a relaxing period?

Ans. The third phase i.e. transitional period of training is a relaxing period. It is also called off reason as player gets recovery from competition stress.

(ii) Which phase is the longest period of training?

Ans. The preparatory phase is the longest period of training. It has three phases and the total duration is 4-5 months. It prepares a player for an upcoming sports event.

3. Sanju wants to loose weight rapidly to take part in a boxing event. At the same time, he wants to improve his muscle mass. He has started taking diuretics and anabolic steroids. Based on this case, answer the following questions.

(i) What are diuretics?

Ans. Diuretics are used to remove fluids from the body to reduce body weight rapidly. They are used by boxers, wrestlers, weightlifters, etc.

(ii) What are the side effects of Beta-2 Agonists?

Ans. The side effects of Beta-2-Agonists are restlessness, rapid heartbeat, excessive sweating, reduction of potassium in blood serum and increase in glucose level etc.

Chapter Test

Multiple Choice Questions

1. Find the incorrect statement

(a) Sports training is a scientifically based program
(b) Sports training is a planned process
(c) Sports training is short term, static program
(d) Sports training is a systematic process.

2. _____ drugs relax the muscle of the airway to allow more oxygen to come in during respiration.

(a) Anabolic Steroids
(b) Beta-2-Agonists
(c) Narcotics
(d) Diuretics

3. ..... is the physical method of doping.

(a) Gene doping
(b) Blood doping
(c) Both (a) and (b)
(d) Neither (a) nor (b)

4. ..... provides guidance about detraining when the athletes stop working out.

(a) Principle of Reversability
(b) Principle of overload
(c) Principle of rest and recovery
(d) Principle of Transfer

5. Which among the following is a performance enhancing drug?

(a) Diuretics
(b) Cannabinoids
(c) Peptide Hormones
(d) All of the above

6. Rohit is a student of class XIth and is going through a stimulant's intake. During a recent medical check-ups at school he was advised to do certain things.

Based on this case, answer the following questions.

(i) Which part or system of body is highly prone to stimulants?

(a) Respiratory system
(b) Digestive system
(c) Cardiovascular system
(d) None of the above

Short Answer (SA) Type Questions

7. Explain the nature of sports training and differentiate it with preparation.

8. How is the principle of specific preparation different from general preparation?

9. The concept of doping is not new. Explain this statement.

10. What is the effect of steroids in sports?

11. Give the ill effects of narcotics.

Long Answer (LA) Type Questions

12. Explain any five principles of sports training in detail.

13. All training programs are divided into how many parts? Explain them.

Answers

1. (c) ***2.*** (b) ***3.*** (c) ***4.*** (a) ***5.*** (c) ***6.*** (c)