CBSE Test Paper 03

CH- 07 Physiology and Injuries in Sports

1. State the amount of blood pumped in one ventricle beat.
2. Discuss any five effects of exercise on Respiratory system.
3. What do you mean by ageing?
4. What do you know about the term Cardiac Output?
5. What is Agility?
6. Discuss physiological differences between males and males.
7. Recall the adaptive effects that take place in our cardiovascular system after engaging in exercise for a longer period.
8. Describe the role of regular exercise on ageing process.
9. Give five physiological differences between males and females.
10. Explain the benefits of exercise on our circulatory system.

CBSE Test Paper 03

CH- 07 Physiology and Injuries in Sports

Answer

1. The amount of blood pumped into the aorta with every heart beat is known as the stroke volume. In an untrained male, it is 70 mL /beat to 90 mL /beat.
2. Improved tidal volume, Improved vital capacity, Breathing will be more rhythmic and regular, improved gas exchange capacity, Improved maximum oxygen uptake, Faster recovery rate, improved aerobic capacity. (Explain with points)
3. Ageing is the process of becoming older. It represents the accumulation of changes in a person over time. Ageing in humans refers to a multidimensional process of physical, psychological, and social change.

4. It is the amount of blood pumped by the heart in one minute. In other words, it is the product of stroke volume and heart rate. Cardiac output increases with the intensity of the exercises.

5. This is the ability of a person to change direction or body position as quickly as possible and regain body control to proceed with another movement.

6. **Muscular strength:** The muscular strength of females is less than males. The contraction and extension of muscles of females is less forceful whereas males have more forceful contraction and extension of muscles.

   Blood circulation: The size of heart in females is smaller in comparison to males. and also there is less amount of blood in females than males. Generally the heart rate of females remains more than males.

   Respiratory organs: Lungs of females are smaller in comparison to males. That's why; females have less endurance than males. In fact, lung capacity of normal healthy female is 10% less in comparison to male of similar shape and size.

   Menstrual cycle: Females should not perform strenuous and vigorous works during menstrual cycle whereas in males there is no such type of cycle.

7. The adaptive ejects that take place in our cardiovascular system alter engaging in exercise for a longer period are crease in heart size We cannot do the exercise on our heart directly, but when we perform exercise regularly, our heart size increases. Exercising develops the muscles of the heart. Again Increase in heart rate Generally an adult has a heart rate of 72 beats per minute while resting, beat when he exercises, his heart rate increases as per the intensity and duration of the exercise. Increase in stroke volume Stroke volume is the quantity of blood which the heart pumps out in single stroke. Due to the heart's size increasing, the stroke volume increases. Decrease in cholesterol level Regular exercise reduces the cholesterol level in our blood, which has a direct link with the blood pressure, increases in number and efficiency of capillaries Regular exercise increases the number of capillaries and their efficiency. Reduced risk of heart diseases Regular exercise gradually reduces stress related hormones from circulating in the blood. This results in increase of blood flow in the blood vessels, which in turn, lowers the risk of building up of plaque which affects the heart. Hence, regular exercise reduces the risk of heart diseases.

8. Regular exercise keeps the human body livelier, fitter and In better condition, thus delaying the ageing processes. As Given below :

   (I) exercise reduces the loss of elasticity from the lungs and chest wall agencies increase muscle strength and hypertrophy by increasing the cross-sectional area of the Slow Twitch Fibers (sm and Fast Twitch Fibers (FTF). This slows down ageing · The body composition changes due to exercise by reducing the fat content of the body, thus slowing down the ageing process. fu Exercise impel flexibility by strengthening the musculoskeletal systems, thereby preventing the bickering of joints. This also slows the ageing process.

9. Physiological differences between males and females are:-

Basis	Males	Females
Muscular	Men are stronger than women because they have greater muscle mass. and more	Women are not as strong as men because their muscle mass in less. On an average, women possess, women possess 2/3rd the strength possessed

Strength	strength than women.	by men. In fact, the contraction and extension of muscles in females is less forceful than in males.
Blood Circulation	There is more amount of blood in females than males. In intense exercises, men have better cardiac output that women.	There is less amount of blood in females than males Women have lower cardiac output than men.
Respiratory Organs	The respiratory functions are better in men They have more Hemoglobin content and VO_2. lungs size of mans are large and capacity of a normal man is approximately 10% larger than women.	The respiratory functions in women lack in certain parameters related to hemoglobin content and $VO_{2.}$ Lungs size of woman are small and capacity of a normal man is approximately 10% smaller than women.
Endurance	The endurance level in main in high by around 10% because of high Hemoglobin content and better blood circulation.	The endurance level in women is even higher due to greater number of white fiber in the muscle.
Bones and ligaments	Men have longer and stronger bones and ligaments but due to a narrow pelvis and higher Centre of gravity, they have poor balance.	Women's bones and ligaments are not strong, but they have a wider pelvis and lower centre of gravity that provides better balance.

10. Physical exercise/training causes changes in the following parameters of circulatory system, such as:
(i) Size of the heart: The blood is supplied to the whole body by heart. The size of heart gets changed as a result of endurance training. Endurance training of more than 12 weeks increases the hearts weight and volume, which further increases the thickness

of the left ventricle's wall and chamber's size. Then, contraction ability of the heart also increases.

(ii) Heart rate: It is the number of times the heart beats per minute. Heart rate is decreased as a result of exercise and training. This decreasing heart rate trend show the improvement of your cardiovascular fitness.

(iii) Stroke volume: It is the amount of blood pumped by the left or right ventricle of the heart per beat. As a result of endurance training the stroke volume increases. Stroke volume for untrained individual at rest is about 55-75 ml. Whereas stroke volume of trained athletes at rest is 80-90 ml. In trained athletes the amount of blood pumped is more in one beat as compared to untrained.

(iv) Cardiac output: The cardiac output at rest remains unchanged but at maximum level of exercise it increases considerably. This increases results mainly form the increase in maximal stroke volume. Maximum cardiac output ranges from 14-20 litres/min. and in trained individuals 25-35 litres/min. or more in highly trained athletes engaged in endurance sports.

(v) Blood volume: Exercise/training results in increase in blood volume which is mainly due to increase in blood plasma volume (liquid portion of blood). The number of red blood cells also increases. Increased blood plasma volume decreases blood thickness that can improve circulation blood and oxygen availability.

Highly trained male athletes may have more than 7 litres of total blood volume as compared to untrained having less than 5.6 litres of total blood volume.