CBSE Test Paper 05

CH- 07 Physiology and Injuries in Sports

1. What do you mean by stroke volume?
2. What is oxygen uptake?
3. State one physiological factor for determining flexibility.
4. What is tidal volume?
5. What is cardiac output?
6. Explain the physiological factors for determining speed.
7. What are the effects of exercise on our muscular system?
8. What do you mean by coping strategies? Write briefly
9. Elaborate any three physiological factors determining endurance.
10. A trainer can improve the respiratory system with the help of exercises. Justify this statement.

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Answer

1. Storke volume is the amount of blood ejected per beat from left ventricle.
2. The amount of oxygen which can be absorbed and consumed by the working muscles from the blood is called oxygen uptake
3. Age & Gender: flexibility decreases with the advancement of age. However it is trainable. It can be enhance with the help of training as strength and endurance are enhanced. Gender also determines flexibility. Females tend to be more flexible than males.
4. Tidal volume (symbol VT or TV) is the lung volume representing the normal volume of air displaced between normal inhalation and exhalation when extra effort is not applied. In a healthy, young human adult, tidal volume is approximately 500 ml per inspiration or 7 ml/kg of body mass.
5. Cardiac output is the amount of blood pumped by the heart in one minute.
6. The following are the factors for determining speed:
    a. Muscle composition: The muscles which consist of more percentage of fast twitch fibres contract with more speed and produce a greater speed. Different muscles of the body have different pwercentage of fast twitch fibres.
    b. Explosive strength: it depends on the shape, size and coordination of muscles. For very quick and explosive movement, explosive strength is required. The related proportion of fast twitch fibres and slow twitch fibres determines the maximum possible speed with which the muscle can contract.
    c. Flexibility: It also determines the speed. Good flexibility allows maximum range of movements and also enables complete utilization of explosive strength.
    d. Biochemical reserves and metabolic power: muscles requires more amount of energy and high rate of consumption for maximum speed performance. For this purpose the stores of ATP & CP in the muscles should be enough. If the store is less, the working process of the muscles slows down after short time.

7. Effects of exercise on our muscular system are as follows:

    - regular exercise change the shape and size of muscles.
    - Muscle remain in tone position.
    - it controls extra fat deposit.
    - it improves reaction time.
    - it delays the fatigue.
    - it improves the effeciency of movement of muscles.
    - it makes the figure beautiful.

8. Coping refers to the thoughts and actions which we use to deal with a threatening situation. It can also be referred to as conscious effort to solve the problem and reduce stress.
   There are of two types.

    i. Emotion-focused coping strategies are those strategies which are used to tackle the feelings of distress rather than the actual problem.
    ii. Problem-focused coping strategies deal with the root causes of stress and are tried by the sports persons to improve the stressful environment experienced by them.

9. Aerobic capacity:-

    i. oxygen intake
    ii. oxygen transport
    iii. oxygen uptake
    iv. Energy reserves,
    v. Lactic acid tolerance,
    vi. Movement economy,
    vii. Muscle composition

   Oxygen Uptake:- It is highest rate at which oxygen can be taken up and consumed by the heart per minute.
   Cardiac Output: - The cardiac output is simply the amount of blood pumped by the beat per minute.
   Hydration and Endurance Exercise: - Sweating is normal physiological response to prolonged exercise, required for the dissipation of hear produced during energy

metabolism.

10. The respiration system consists of organs responsible for taking in oxygen for respiration and releasing carbon dioxide and water vapor, which are the waste products formed during respiration.

    The passages in the nose, windpipe (trachea), bronchi, lungs and air sacs are the main organs of the respiratory system. Trainer can improve the respiratory system with the help of exercise by

    i. Increasing the lung volume and capacity Vital capacity, which is the maximal volume of air? Forcefully expired after a maximal inspiration, in a normal untrained person may be 3-4 litres, but in a trained athlete this goes up to 5-6 liters. Reducing the breathing frequency In a normal untrained individual, the resting breathing frequency is about 12-20 breaths/min, whereas in trained athletes, it comes down to 7-8 breaths/min.
    ii. Maximizing the minute ventilation Maximum minute ventilation in an untrained individual is about 100 limits, whereas in trained athletes it increases to more than 150-160 limit. Increasing the tidal volume In an untrained individual, tidal volume is about 500 mu breath.
    iii. Increasing the ventilator efficiency normally, 15 L of air is required to get 1 L of oxygen but a trained individual gets the same amount of oxygen, i. e. one liter, from less air i. e. 12 L. active for diffusion. The size of the alveoli is also increased, which provides more space for diffusion of gases such as oxygen (02) and carbon dioxide ($C0_2$).