CBSE Test Paper 01

CH- 07 Physiology and Injuries in Sports

1. Define cardiovascular fitness?
2. What is Speed?
3. What type of fracture is known as Greenstick Fracture?
4. What is 'stroke volume'?
5. What is tidal air capacity?
6. Discuss any two physiological factors for determining speed.
7. Specify the role of physiology in exercise and sports.
8. Elucidate the effects of exercise on circulatory system?
9. A trainer can improve the respiratory system with the help of exercise. Justify this statement.
10. What are the various factors affecting physiological fitness? Explain.

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Answer

1. It is the ability of an individual to strengthen the heart muscles during continuous muscular activities in which number of muscles groups are used
2. This is the rapidity with which one can repeat successive movements in the same pattern.
3. Greenstick Fracture is a bend or crack in a bone usually found in children.
4. Stroke Volume- The amount of blood pumped into the aorta with every heartbeat is known as the stroke volume (SV) in other words stroke volume is the volume of blood pumped from the left ventricle per beat. In an untrained male, it is 70 mL/beat to 90 mL/beat.
5. Tidal air capacity is the amount of air that flows in and out of the lungs in each quiet respiratory movement.
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 percentage 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.
7. Exercise physiology is the study of how exercise alters the function and structure of the body. A sports physiologist examines the acute responses and chronic adaptations to athletic performance in a variety of environments. While a sports physiologist can test the effect of exercises in a laboratory, which has a controlled environment, it is not always possible to simulate sporting activity in a Lab. So physiologists use field based testing as m such as possible. Physiology can improve an athlete's performance

by giving important objective information which can help coaches to adapt training programmes to maximize their desired outcome. This will depend on many factors including the environment, diet, gender, age and health.

8. Regular exercise improves fitness and has beneficial effects on the heart. The heart muscle, like any body muscle when exercised become stronger as do the chambers, particularly the left ventricle. This is commonly known as the athlete‘s heart. This is commonly known as the efficiency at a slower rate, Pumping more blood with each bear. Thus the heart works more efficiently even at slower rate.

9. The respiration system consists of organs responsible for taking m 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.
   A trainer can improve the respiratory system with the help of exercise by

   1. 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 3500 cc, but ma trained athlete this goes up to 5500 ccs.
   2. The decrease in the rate of respiration: When a beginner starts exercising his rate of respiration increases. But when the same individual performs exercise daily, his rate of respiration decreases in comparison to the beginner at rest.
   3. Maximizing the Minute Ventilation Maximum minute ventilation in an untrained individual is about 100 L/mm, whereas in trained athletes it Increases to more than 150-160 L/min.
   4. Increase in Tidal air capacity: by doing regular exercise it has been noted that there is an increase in the amount of tidal air capacity of an individual.
   5. Increasing the Ventilatory Efficiency Normally, 15 L of air is required to get 1L of oxygen but a trained individual gets the same amount of oxygen, i.e. one litre from less air i.e. 12L
   6. Increasing the Pulmonary Diffusion During maximal level of exercise, more Alveoli become active for diffusion. The size of the alveoli is also increased. which provides more space for diffusion of gases such as oxygen (O_2) and carbon dioxide (CO_2).

7. Strong will power: regular exercise increases the will power of an individual. As Pranayama, the specific exercise for lungs increases the will power of the doer.
8. Unused alveolus becomes active: Regular exercise activates the unused alveolus because much amount of oxygen is required in vigorous activities of daily routine. The passive alveolus become active.
9. Increase in vital air capacity: The capacity of vital air capacity varies from 3500cc to 4500cc in a normal adult. Due to regular exercise, its capacity increases up to 5500cc.

10. The following are the factors that affect the physiological fitness.

    i. Anatomical structure: An individual must be appropriate in body size, shape and structure essential for the performance. Sometimes genetic impaired organs are responsible for weakness in structure which limits individual performance.
    ii. Psychological factors or stress tension: This can become a barrier to performance by contributing tension and anxiety which affect the fitness level of a person. One must be mentally tough/strong and prepared to perform better.
    iii. Climate: Physical fitness also gets influenced by different climatic conditions such as summer, winter and humid.
        - During Summer Exercise must be done early morning .
        - Drink plenty of fluid.
        - Wear light loose fitting, comfortable clothes.
        - In winter dress in layers.
        - Stop if you experience dizziness, shivering, cramp, etc.
    iv. Diet: Plays an important role in maintaining physical fitness level. Diet requirement varies from individual to individual game wise. Therefore, while planning fitness programme diet factor must also be given due consideration.
    v. Healthy surroundings: A healthy environment at home/ school/ playfields is helpful in proper growth and development of an individual which creates a better learning situation. There is a need for proper working environment for participation in sports activities, otherwise it will affect the fitness of individual.