2024

PHYSIOLOGY OF EXERCISE

Course : MPCC-102

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Describe the structure of neuro-muscular junction. Explain the chemical changes occur during skeletal muscle contraction. Discuss the energy system used for short duration high intensity exercise. 6+4+5

Or,

Describe the structure and function of myofilaments with proper diagram. What is a Sarcomere? Explain different types of heat generated by muscle during muscular contraction. 6+4+5

2. What is CHD? Write the symptoms, causes and preventive measures of Atherosclerosis. What are the possible effects of aerobic training on cardiovascular system? 2+6+7

Or,

What is Cardiac output? How to calculate Cardiac output? Describe some factors affecting cardiac output. 3+4+8

3. What is Pulmonary Ventilation? What are the roles of muscles in respiration? Write down the effects of hot environment on Sports Performance. 6+4+5

Or,

What is EPOC? Explain the importance of VO_2 max in sports performance. Discuss the effects of exercises on respiratory system. 3+5+7

4. Write notes on (***any two***) : 7½×2

   (a) Effect of high altitude on Sports Performance

   (b) Aerobic Metabolism

   (c) Ergogenic aids

   (d) Regulation of heart rate.

Please Turn Over

5. Answer the following MCQs by choosing the right option given below and writing it on your answer script (***any ten***) : 1×10

(a) Types of Troponin protein found in the skeletal muscles are

(i) 1 (ii) 3

(iii) 4 (iv) 8.

(b) The main Centre of Brain that regulates the respiration rate is located in

(i) Midbrain (ii) Hypothalamus

(iii) Medulla oblongata (iv) Forebrain.

(c) Hypercapnia is a condition where

(i) the airway becomes partially obstructed.

(ii) the blood does not clot properly.

(iii) the blood Carbon-di-Oxide levels are abnormally low.

(iv) the blood Carbon-di-Oxide levels are abnormally high.

(d) Anabolic steroids can significantly affect on

(i) Kidneys (ii) Artery walls

(iii) Brain (iv) Stomach.

(e) Stroke volume is measured in terms of

(i) Millilitres (ii) Millimetres

(iii) Millilitres per beat (iv) mmHg.

(f) Blood corpuscles which are responsible for blood clotting are

(i) Platelets (ii) Leucocytes

(iii) Erythrocytes (iv) Monocytes.

(g) Which one of the following proteins binds to Calcium during muscular contraction?

(i) Troponin C (ii) Troponin T

(iii) Troponin I (iv) None of these.

(h) Athlete's heart is associated with

(i) cardiac hypertrophy (ii) low resting heart rate

(iii) cardiomegaly (iv) All of these.

(i) The extra amount of air that can be inhaled after a normal breath is called

(i) Vital capacity (ii) Inspiratory reserve volume

(iii) Inspiratory capacity (iv) Functional residual capacity.

(j) In excitation-contraction coupling

(i) The muscle action potential propagates along the sarcolemma and down the transverse tubules.

(ii) Ca^{2+} released from the Sarcoplasmic Reticulum binds to Tropomyosin.

(iii) Troponin blocks binding of Myosin heads to Actin filaments.

(iv) Relaxation occurs when Ca^{2+} is excreted from the muscle fibre.

(k) Acetylcholine receptors are present at

(i) the presynaptic membrane of neuromuscular junction

(ii) the postsynaptic membrane of neuromuscular junction

(iii) the nucleus

(iv) the myosin protein.

(l) TCA cycle occurs at

(i) Cell membrane (ii) Mitochondria

(iii) Nucleus (iv) Cytoplasm.
