

2021

PHYSIOLOGY OF EXERCISE

Paper: MPCC-102

Full Marks-70

The figures in the margin indicate full marks.

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

Answer all Questions

1. Describe the process of skeletal muscle contraction in detail with diagram. What is EC Coupling?
What is the function of motor neurons? 8+4+3

Or,

What is Neuromuscular Junction? Discuss the types of muscle fibre and their functions in different
types of exercise. Discuss the effects of training on muscular system. 3+5+7

2. What is Cardiac Output? Discuss the relationship between stroke volume and cardiac output.
Discuss the location and functions of SA Node. Discuss the effects of exercise on cardiovascular
system. 2+3+4+6

Or,

Explain the physiological process of heart rate regulation. Discuss the benefits of therapeutic
exercises in the context of cardiovascular disease. Discuss the effects of training on cardiovascular
system. 5+4+6

3. Discuss the role of respiratory muscles in the breathing process. What is Pulmonary Ventilation?
Discuss the changes of pulmonary ventilation during exercise. What is EPOC? Describe the
relationship between O₂ debt and sports performance. 5+2+3+2+3

Or,

Describe the process of determination of VO₂max. Discuss the effects of training on respiratory
system. 7+8

Please Turn Over

(2)

4. Write short notes on the following (**any two**):

7.5x2

- a) ATP-PC system
- b) Sports performance at High Altitude
- c) Sports performance in Hot & Humid condition
- d) Amphetamines and Ephedrine as doping agents

5. Answer the MCQs by choosing the right option from the following and writing it on your answer script (**any ten**):

1x10

a) AV node is present in:

- (i) Left atrium
- (ii) Left ventricle
- (iii) Near the superior venacava
- (iv) Lower back section of the interatrial septum

b) The value of MET of an adult is:

- (i) 5.3 ml/kg/min
- (ii) 3.5 ml/kg/min
- (iii) 5.5 ml/kg/min
- (iv) 8.5 ml/kg/min

c) Which one of the following enzyme is involve in TCA Cycle?

- (i) Lactate dehydrogenase
- (ii) Glycogen synthase
- (iii) Phosphofructokinase kinase-I
- (iv) Succinate dehydrogenase

d) Wall of the left ventricle of heart thickens as a result of training occurs in:

- (i) 4x100 m Hurdlers
- (ii) 100 m Sprinters
- (iii) Marathon runners
- (iv) Weightlifters

e) Chemoreceptor in the aortic arch or the carotid bodies respond to:

- (i) Changes in PO₂
- (ii) Changes in Heart rate
- (iii) Changes in H⁺ ions
- (iv) Changes in Hemoglobin saturation

Please Turn Over

(3)

- f) Increase in cardiac work during high altitude exposure is due to:
- (i) Increased viscosity of blood
 - (ii) Increased after load against which the heart is pumping
 - (iii) Increase in heart rate
 - (iv) All of the above
- g) Which one of the following enzymes is the enzyme in glycogenolysis?
- (i) Lactate dehydrogenase
 - (ii) Glycogen phosphorylase
 - (iii) Phosphofructokinase kinase-I
 - (iv) All of the above
- h) Which one of the following proteins binds to tropomyosin during muscular contraction?
- (i) Troponin C.
 - (ii) Troponin T.
 - (iii) Troponin I.
 - (iv) Myosin.
- i) Amount of Oxygen is carried out per 100 ml of venous blood in normal condition is:
- (i) 14 ml
 - (ii) 18 ml
 - (iii) 19 ml
 - (iv) 20 ml
- j) The thermoregulatory process in human body is controlled by:
- (i) Radiation
 - (ii) Convection
 - (iii) Hypothalamus
 - (iv) None of the above
- k) Which of the following is not a respiratory muscle?
- (i) Diaphragm
 - (ii) Sternocleidomastoid
 - (iii) Intercostal
 - (iv) Soleus
- l) An acclimatization period of above 15000 ft is:
- (i) 7 days
 - (ii) 10 days
 - (iii) 15 days
 - (iv) 21 days
-