

2022

PHYSIOLOGY OF EXERCISE

Paper: 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.

Answer the following questions.

1. Differentiate between myofibril and myofilament. Describe the functions of different subunits of Troponin complex during muscle contraction? Describe the effects of endurance training and anaerobic training on muscular system. **4+3+8**

Or,

Describe the macrostructure of a skeletal muscle with a diagram. Describe the different types of heat produced during the muscular contraction. Discuss the steps of cross bridge cycle formation. **(5+2)+5+3**

2. What is cardiovascular drift? Explain the effect of sports training on the ventricles of the heart. Discuss the effects of acute exercise on cardiovascular system. **4+4+7**

Or,

Describe the conduction system of the heart with a diagram. Discuss the effects of exercise and sports training on cardiovascular system. **6+9**

3. Discuss the role of external intercostals and diaphragm muscle in respiration. Define the different components of Total Lung Volume. Write the importance of Vital Capacity in respect to endurance sport. **6+4+5**

Or,

Discuss the effects of exercises on respiratory system. Discuss the importance of VO_{2max} in sports performance. Describe the process of O_2 transport in the human body. **7+4+4**

4. Write Short note on *any two* from the following

7.5× 2

- a) Lactic acid system
- b) Thermoregulation process
- c) ATP-PC System
- d) Measurement of energy cost of an activity
- e) Beta blocker as an ergogenic aid

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

1x10

a) Chemoreceptors in the aortic arch or the carotid bodies respond to

- (i) Changes in PO_2
- (ii) Changes in Heart rate
- (iii) Changes in H^+ ions
- (iv) Changes in Haemoglobin saturation

b) One of the main reasons for hyperventilation in lungs during moderate to high exercise intensities is to:

- (i) meet the demands of the muscle for oxygen delivery
- (ii) meet the demands of the muscle pH
- (iii) counteract the lactic acid actions
- (iv) All of the above

c) Ventilatory breakpoint can be measured by

- (i) Volume of O_2 against exercise intensities
- (ii) Simplistic assessment when Respiratory Exchange Ratio will rise above the value of 1
- (iii) Measurement of PCO_2 against exercise intensities
- (iv) Measurement of PO_2 against exercise intensities

d) 'Respiratory alkalosis' occurs due to

- (i) Reduced arterial PO_2
- (ii) Reduced arterial PCO_2
- (iii) Reduced venous PO_2
- (iv) Reduced venous PCO_2

e) Increase in cardiac work during high altitude exposure is due to

- (i) Increased viscosity of blood
- (ii) Increased load against which the heart is pumping
- (iii) Increase in heart rate
- (iv) All of the above

f) Which one of the following enzymes is the enzyme involved in Glycolysis process?

- (i) Lactate dehydrogenase
- (ii) Glycogen phosphorylase
- (iii) Phosphofructo kinase-I
- (iv) All of the above

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

- (i) Troponin C.
- (ii) Troponin T.
- (iii) Troponin I.
- (iv) None of the above.

h) Left Ventricular hypertrophy occurs due to

- (i) Training effect on respiratory system
- (ii) Exercise effect on respiratory system
- (iii) Training effect on cardiovascular system
- (iv) Exercise effect on cardiovascular system

i) The enzyme creatinekinase is involved with

- (i) Aerobic system
- (ii) Anaerobic system
- (iii) ATP-PC system
- (iv) None of the above

j) Preoptic nucleus of the hypothalamus is involved

- (i) Controlling the temperature of the body
- (ii) Acting as the thermostat for sensing the body temperature
- (iii) Acting as thirst centre
- (iv) Acting as feeding and satiety centre

k) Amount of Oxygen carried away per 100ml of venous blood in normal condition is

- i) 14ml
- ii) 18ml
- iii) 19ml
- iv) 20ml

l) Chloride shift event during CO₂ transport occurs in:

- i) RBC
- ii) WBC
- iii) Platelets
- iv) Basophil

