

**MASTER OF PHYSICAL EDUCATION EXAMINATION, 2023**

( 1st Year, 1st Semester )

**Physiology of Exercise**

**PAPER - MPCC - 102**

Time : Three hours

Full Marks : 70

*Mention the Question number clearly before writing the answer.*

**Group - A**

Answer *any three* questions:

15×3=45

1. Define sarcomere. Explain step-by-step the mechanism of muscular contraction according to Sliding filament theory with diagrams. 1+14=15
2. Explain with diagrams the anaerobic and aerobic system energy supply during rest and exercise. Elaborate the effects of exercise and training on muscular system. 7+8=15
3. Write a brief note on the history of exercise physiology. Write in details about the need and importance of exercise and sports physiology in the field of physical education and sports sciences. 7+8=15
4. What do you mean by systemic and pulmonary circulation? Explain the difference between Cardiovascular and Circulatory System? Explain short-term changes in heart rate, stroke volume and cardiac output during different intensities of physical activity. 3+3+9=15
5. Write the nature and mechanism of respiration during exercise? Describe the action potential and its components. Explain in details ventilatory responses during rest and exercise. 3+5+7=15

**Group - B**

Write short notes on *any two* of the following :

7½×2=15

6. Macrostructure of skeletal muscle with diagram
7. Diuretics and Beta Blockers
8. Thermoregulation and Sports Performance
9. Central Nervous System

[ Turn over

**Group - C**

10. Write the correct option (*any ten*) : 1×10=10

- i) Glutamic acid and glycine are types of .....
- a) fatty acids b) non-essential amino acids  
c) polysaccharides d) essential amino acids
- ii) ..... are drugs that increase protein synthesis and ..... mask their presence.

- a) Beta blockers and amphetamines b) Anabolic steroids and diuretics  
c) Stimulants and analgesics d) Anabolic steroids and stimulants

iii) ..... is the ability of the muscle to respond to a stimulus.

- a) Excitability b) Elasticity  
c) Irritability d) Distensibility

iv) Match the following:

- |                          |   |             |
|--------------------------|---|-------------|
| I. Largest known protein | — | A. Nebulin  |
| II. Stabilizing protein  | — | B. Actin    |
| III. Regulatory protein  | — | C. Titin    |
| IV. Contractile protein  | — | D. Troponin |

Codes:

- |    | I | II | III | IV |
|----|---|----|-----|----|
| a) | C | A  | D   | B  |
| b) | B | D  | A   | C  |
| c) | B | D  | C   | A  |
| d) | A | B  | D   | C  |

v) Which of them is not a factor affecting Venous Return:

- a) Increased blood volume b) Skeletal muscle pump  
c) Increased veno motor tone d) Blood brain barrier

vi) During inspiration ..... occurs.

- a) Volume of the thoracic cavity increases, air moves out of the lungs above the pressure gradient, diaphragm contracts

- b) Volume of the thoracic cavity increases, air moves into the lungs down the pressure gradient, diaphragm contracts
  - c) Volume of the thoracic cavity increases, air moves out of the lungs above the pressure gradient, diaphragm relaxes
  - d) Volume of the thoracic cavity increases, air moves into the lungs down the pressure gradient, diaphragm relaxes
- vii) High altitude training is not associated with .....
- a) Increased RBC Production
  - b) hypoxic training method
  - c) Training at sea level
  - d) acclimatization
- viii) The ..... stimulus in muscle contraction follows the all or non-law
- a) motor
  - b) sub threshold
  - c) sensory
  - d) threshold
- ix) The protoplasm of the muscle cell is .....
- a) sarcolemma
  - b) sarcoplasmic reticulum
  - c) sarcomere
  - d) sacroplasm
- x) Embden-Meyerhof Pathway is synonymous to .....
- a) Glycolysis
  - b) Glycogenesis
  - c) Kreb's Cycle
  - d) ETC chain
- xi) Match the following:
- |                                |   |                  |
|--------------------------------|---|------------------|
| I. Excitatory Neurotransmitter | — | A. ADH           |
| II. Endorphin                  | — | B. Acetylcholine |
| III. Stress Hormone            | — | C. Dopamine      |
| IV. Water Homeostasis          | — | D. Cortisol      |
- Codes:
- |      |    |     |    |
|------|----|-----|----|
| I    | II | III | IV |
| a) C | A  | B   | D  |
| b) B | D  | A   | C  |
| c) B | C  | D   | A  |
| d) A | B  | D   | C  |
- xii) A chemical synapse transmits the impulse through .....
- a) enzymes
  - b) cerebrospinal fluid
  - c) neurotransmitters
  - d) ions