



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2024/2025

**SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF EDUCATION ARTS**

EPH 3201: FUNCTIONAL HUMAN PHYSIOLOGY

DATE: JANUARY 2025

TIME: 2 HOURS

INSTRUCTIONS: Answer question **one** and any other **two** questions

QUESTION ONE (30 MARKS)

- a) Explain three (3) Physiological reasons why a Physical Education teacher should study Human Physiology (6 Marks)
- b) Distinguish the roles of the following during Physical Activities (6 Marks)
 - i) Cell Membrane
 - ii) Cytoplasm
 - iii) Mitochondria
- c) Explain the effects of Physical Exercises on the following (8 Marks)
 - i) Heart Rate (H.R)
 - ii) Stroke Volume (S.V)
 - iii) Cardiac Output (C.O)

iv) An Athlete during Physical Activities has a Heart Rate of 140 and a Cardiac Output of 70 liters per minute. Calculate the Stroke Volume of this athlete in liters.

d) Explain the impact of the following in Physical Activities (10 Marks)

- i) Hypoxia
- ii) Hypoglycemia
- iii) Glycolysis
- iv) Kreb's Cycle
- v) Adenosine Tri-phosphate (ATP) Energy Levels

QUESTION TWO (20 MARKS)

a) Explain the role of the following in human movement (10 Marks)

- i) Smooth Muscles
- ii) Cardiac Muscles
- iii) Skeletal Muscles
- iv) Fast twitch Muscle Fibers
- v) Slow Twitch Muscle Fibers

b) Discuss the role of the following in the energy systems in the body (10 Marks)

- i) Carbohydrates
- ii) Proteins
- iii) Fats
- iv) Body Liver

QUESTION THREE (20 MARKS)

a) Explain the following in the body's energy system

- i) Lactic Acid Energy System (6 Marks)
- ii) Aerobic Energy System (6 Marks)

b) Discuss the two Circulatory Pathways (8 Marks)

QUESTION FOUR (20 MARKS)

- a) Distinguish between External and Internal Respiration (6 Mark)
- b) Describe the breathing mechanism in an athlete's body (6 Marks)
- c) Discuss the concept; VO₂ Max and explain on how it acts as an indicator of Cardio-Vascular endurance (8 Marks)

QUESTION FIVE (20 MARKS)

- a) Discuss the concept "Osmo-regulation" in the body (4 Marks)
- b) Explain thermal regulation process in the body (8 Marks)
- c) Distinguish between Mechanical and Chemical Digestion (8 Marks)