



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) Krebs'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; VO_2 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)