

UNIVERSITY OF CAPE TOWN  
STELLENBOSCH UNIVERSITY

MMed Emergency Medicine  
Primary examination  
Written examination  
16 March 2007

**Anatomy and Physiology long answer paper**

0900 - 1200

This paper consists of **THREE** long answer questions. All questions are to be answered. Each question is worth 100 marks.

Answer each question in a separate book.

## 1.

A 32 year old man presents after a gunshot wound to the calf.

He has a swollen, tender calf and increasing levels of pain. There are initially good distal pulses and a warm foot, but as the pain increases, the pulses begin to diminish.

- Describe the anatomical muscle compartments of the below-knee segment of the leg
- List the muscle groups, the blood supply to these muscles, and their innervation
- Describe the branches of the popliteal artery that produce the distal pulses

## 2.

Describe the major events occurring during the cardiac cycle for the left side of the heart in terms of ventricular action potential, ECG trace, heart sounds, pressures (atrial, ventricular and aortic) and ventricular volumes.

Use a detailed diagram to demonstrate the relative timing of the various events.

## 3.

Describe the physiological process of ventilation-perfusion matching in the lung.

Provide clinical examples of ventilation-perfusion mismatch, and explain how these occur.