

UNIVERSITY OF CAPE TOWN
STELLENBOSCH UNIVERSITY
Faculty of Health Sciences

MMed Emergency Medicine
Primary examination

13 March 2008

Physiology

1300 - 1600

**NO CALCULATORS AND/OR
ELECTRONIC EQUIPMENT/AID WILL BE ALLOWED**

This paper consists of **FIVE** short answer questions and **TWO** long answer questions. Overall marks for this paper are allocated as follows:

Short answer questions: 33%
Long answer questions: 67%

All questions are marked as a percentage: if a question is in sections, the percentage allocated to that section is given as a guide to you.

All questions are to be answered.

Answer questions in the following books:

Question	Book
1-3	1
4-5	2
6	3
7	4

Short Answer Questions

1.
The lung is made up by a number of zones defining the driving forces for blood flow. Use diagrams and/ or text to explain this phenomenon.
2.
Using a diagram, explain the physiology of the Renin-angiotensin system.
3.
Write short notes on cardiac output, including discussion of Frank-Starling's law.
4.
Write short notes on the chemical control of Respiration
5.
Discuss the mechanism of action of the various vagal manoeuvres available to treat a supraventricular tachycardia

Long Answer Questions

6.

Discuss the various physiological controls and means of manipulation of intracranial pressure in the head-injured patient.

7.

The following questions all relate to conduction and synaptic transmission in nerves.

a. With the aid of a diagram:

i. Discuss the ionic fluxes during conduction of the action potential in a nerve

(20)

ii. Explain how Lignocaine affects this conduction

(5)

b. Discuss anterograde and retrograde transport in neurons. Give examples (physiologically or pathologically) of these transport mechanisms in action.

(10)

c. By means of a diagram, discuss in detail synaptic transmission at the neuromuscular junction. Include in your answer details of the formation and breakdown of neurotransmitters, as well as details of the postsynaptic receptor.

(35)

i. Using your diagram show where the following drugs/toxins work:

1. Botulism toxin
2. Tetanus toxin
3. Organophosphates
4. Scoline
5. Mamba toxin

(10)

d. Discuss synaptic transmission at postganglionic noradrenergic nerve endings. Include in your answer a discussion of the neurotransmitter and receptors involved.

(20)