



ROYAL AUSTRALASIAN COLLEGE
OF
DENTAL SURGEONS
INCORPORATED
ABN 97 343 369 579

**PRIMARY EXAMINATION IN
PHYSIOLOGY**

Wednesday 29 November 2006

Time allowed: Two hours

INSTRUCTIONS TO CANDIDATES:

The complete examination in Physiology is in two parts:

This paper is worth 75% of the final mark;

The viva is worth 25% of the final mark.

- Answer **FOUR (4)** of the following six (6) questions. If you answer more than four questions, only your *first four* answers will be marked.
- Each question is of equal value, namely, 25% of the total for the written paper.
- The total marks for this paper will be scaled to constitute 75% of the final mark.
- Ample time is allowed for your answers, so you should strive to present them in a well-organised manner.
- Diagrams may be used to illustrate your answers where appropriate.
- Allow time at the end of the examination to read your answers *carefully*.

Question 1

(30 minutes: 25 marks)

You have extracted the upper molar teeth from a 45 year-old female patient under local anaesthesia. She elects to sit quietly in your waiting room while recovering. After 1 hour it is clear that she has lost a considerable amount of blood, some of which she has swallowed, the rest soaking a large number of tissues she has held to her mouth. She reports feeling dizzy when she tries to stand up.

- a. What signs would you expect to see upon clinical examination in a patient who has lost a significant amount of blood?
- b. What are the physiological mechanisms responsible for these signs?
- c. What changes would you see in this patient's haematocrit at this time?
- d. What long-term physiological mechanisms will ultimately restore the patient's blood volume and composition to normal?

Question 2

(30 minutes: 25 marks)

- a. Explain how the intensity and character (type) of pain is coded by sensory afferent nerves.
- b. The perception of pain can be modified by rubbing the affected body part, or by the emotional state of the individual. Explain the physiological mechanisms responsible for these observations.



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written paper continued

Question 3

(30 minutes: 25 marks)

- Describe the clinical signs of an acute anaphylactic reaction.
- Explain the pathophysiological mechanisms that are responsible for these signs.
- Discuss the pharmacological management of anaphylaxis, including the mechanisms by which any drug you mention produces a beneficial effect.

Question 4

(30 minutes: 25 marks)

Write brief notes on:

- the mechanism of action of local anaesthetic drugs;
- chemical control of breathing;
- long-term corticosteroid therapy and the patient's response to stress.

Question 5

(30 minutes: 25 marks)

Describe the composition and functions of saliva. Include in your answer a discussion of how and why the flow rate affects the composition of saliva.

Question 6

(30 minutes: 25 marks)

Write brief notes on:

- the stretch reflex in the control of masticatory muscles
- parathyroid hormone and regulation of body calcium levels
- neurotransmitters and their receptors in the parasympathetic and sympathetic branches of the autonomic nervous system

This is the last page of this examination paper