

## La Trobe University

### Semester One Examination Period

### 2008

Student ID:

Seat Number:

**Unit Code: HBS3APA**

**Paper No: 1 of 1**

Unit Name: Advanced Physiology A

Paper Name: Advanced Physiology A

Reading Time: 15 minutes

Writing Time: 3 hours

No. of Pages (including cover sheet): 14

#### ALLOWABLE MATERIALS

Number	Description
101	Unmarked except for underlining, highlighting and tabbing non-electronic non-medical translation dictionary by prior arrangement

#### INSTRUCTIONS TO CANDIDATES

1. This examination consists of two sections, A and B.
2. Section A consists of 50 multiple-choice questions. Answers must be entered on the answer sheet provided. Instructions for completing the answer sheet are on page 2 of this paper — read them carefully. For Unit code enter HBS3APA.
3. Each multiple-choice question is worth 1 mark. No marks will be deducted for incorrect answers. It is suggested that you spend approximately 80 minutes on this section.
4. Section B consists of 10 short-essay questions. Attempt any five (5) only of the short-essay questions. Each question is worth 10 marks. Start each question on a new page.
5. It is suggested that you spend approximately 20 minutes on each of the 5 questions, or 100 minutes in total on Section B.

**This paper MUST NOT BE REMOVED from the examination venue**

## SECTION B

**ANSWER ANY FIVE (5) OF THE FOLLOWING TEN QUESTIONS**  
**COMPLETE ALL PARTS OF ANY QUESTION WHICH HAS SEVERAL PARTS**  
**START EACH QUESTION ON A NEW PAGE**  
**EACH QUESTION IS WORTH 10 MARKS**

1. List and describe the major molecular targets of drug action. Outline the ways in which drugs can act on these targets to produce different responses. You may use diagrams to assist in your explanations.
2. Describe the anatomy of the peripheral nervous system (a diagram may be used). Include the neurotransmitters and receptors that are found at each synapse. Give an example of a drug that acts at each of these sites. You should describe briefly the mechanism of action of the drug and state its clinical use.
3. List and discuss both systemic and local factors that may lead to a delay in wound healing.
4. Discuss complications that may be caused by cancer growth.

For question 5:

Instructions included with the emergency rations of food and water in a life raft state:

**SHIPWRECK SURVIVAL**

Do NOT consume any of the water rations for the first 24 hours in the life raft.

NEVER drink sea water.

NEVER drink your urine (with the possible exception of the urine produced in the first few hours).

5. a) Predict the changes which will occur in urine volume and concentration over 24 hours for a person who has nothing to drink.  
AND  
b) Explain the physiological basis for the instructions in the life raft.

**FOR INFORMATION:**

- The composition of extracellular fluid is approximately 0.9% sodium chloride, that is 0.9g of sodium chloride dissolved in 100mL water.
- The composition of sea water is approximately 4% sodium chloride, that is, 4.0g of sodium chloride dissolved in 100mL of water.

*The contribution made by other ions can be ignored for this question.*

6. Discuss the concept of neural plasticity and its role in brain function, using at least one example (e.g. the NMDA receptor, cerebellar learning, reorganization of somatosensory maps).
7. Outline the physiological characteristics of the two main phases of sleep and discuss their possible functions.
8. Outline the major psychotropic drugs used in the treatment of behavioural disorders of the central nervous system. You should include the mechanism of action of these drugs and give an example from each major group.
9. Describe the physiology of pain perception. Give an example of an opioid that is used to treat pain and describe its mechanism of action.
10. Discuss a possible pathogenesis for multiple sclerosis which will account for its clinical presentation.