

In General

The exam will consist of 50 multiple choice questions with 4 alternatives each. To successfully answer the questions you may be required to incorporate information from more than 1 slide or even 1 lecture. This means that you should not try and memorize the information, rather understand it. Physiology cannot be memorized (as with Anatomy). The exam shall consist of the following lectures:

- Introduction, ANS, Endocrinology, Cardiovascular I.

Bring your student ID, a good eraser and at least 1 pre-sharpened dark pencil to the exam.

Disclaimer: This study guide is NOT meant to be a comprehensive list of everything you need to know but it gives you a very good start.

The Specifics

Introduction

1. Understand what homeostasis is especially the full definition (shown as bullets in the lecture) as described by Claude Bernard.
2. Know the definition of osmosis and understand which way water moves across a cell membrane when given different concentration values on either side of the cell.
3. Know what is meant by feedback mechanisms and understand how both negative and positive feedback mechanisms operate. Which feedback mechanism is more common and why?
4. Come up with examples of both types of feedback mechanisms.

ANS

1. Understand how the nervous system in humans is arranged and the differences between the somatic and autonomic nervous system (ANS).
2. What types of neurons are found in the ANS?
3. Identify some differences between the somatic and autonomic nervous system.
4. Know what neurotransmitters are found in what nervous system.
5. Here are some questions you should be able to answer. What is a ganglion? How many ways does the sympathetic nervous system operate? What target organs are innervated by the autonomic nervous system?
6. Describe how the ANS neurons are anatomically arranged.
7. What are some physiological effects to organs of stimulating either the sympathetic and parasympathetic nervous system?
8. What is the difference between cholinergic and adrenergic neurons, and between cholinergic and adrenergic receptors? Where are they located? What ultimately controls the ANS?

Endocrinology

1. Understand differences between the endocrinology and nervous systems in terms of how they operate.
2. Be able to list glands and organs that have a role in endocrinology.
3. Know the difference between steroid and amino acid-based hormones.
4. Understand why secondary messenger systems occur in the first place. Understand the steps involved in different secondary messenger systems with amino-acid based hormones.
5. Understand the steps involved in steroid hormone operation.
6. Know how and where hormones are carried in the body, how they are degraded and what is meant

- by half-life.
7. Know the different stimuli for the release of hormones and which hormones use which stimulus.
 8. For each of the hormone described in the lecture know a) where it is released from, 2) what organ(s) it targets (and the effect it has on those organs), 3) what the stimulus for its release is, and 4) how it is down regulated.

Cardiovascular I

1. Know all of the components that constitute blood.
2. Know what is meant by the hematocrit and if it changes (high or low) why this is a problem.
3. Know what constitutes plasma. Understand the role of albumin in blood and what an osmotic buffer means.
4. Understand the stimulus and mechanism for, and the steps involved in erythropoiesis.
5. Know the hemoglobin molecule in detail (i.e., its structure, what gases bind where, the different states hemoglobin occurs in the body and what those states are called).
6. Understand how hemoglobin is destroyed and what happens to each of those components.
7. Understand the physiological implications of each types of anemia described in the lecture.
8. Know the mechanisms by which WBCs leave the bloodstream to fight infection.
9. Be able to recognize the different types of WBCs under a microscope.
10. Understand how platelets are formed and their role in hemostasis. Know the different steps in hemostasis.
11. Understand who can donate blood to whom for the purposes of a blood transfusion. This includes the ABO and Rh blood groups.
12. Understand what the effects of a change in viscosity, systolic and diastolic blood pressure, and blood vessel length and vessel diameter have on blood flow.
13. Understand the physiological importance of the capillary network to body cells and which vessels in the body have a high and low flow rate.
14. Understand the different types of laminar flow and which occur in which vessels.
15. Understand what turbulent blood flow is and in what vessels it occurs.
16. Understand what is meant by compliance, which vessels have a greater compliance and why.