



FACULTY OF SCIENCE

DEPARTMENT OF ZOOLOGY

MODULE	PHS 2B01 – CONTROL SYSTEMS
CAMPUS	APK
EXAM	SUPPLEMENTARY

DATE: 12 Jan 2017

SESSION:15:00

ASSESSOR(S):

DR JC VAN DYK

INTERNAL MODERATOR:

PROF GM WAGENAAR

DURATION: 2 HOURS

MARKS: 100

NUMBER OF PAGES: 3

INSTRUCTIONS: Answer all the questions.

SECTION A

QUESTION 1

Peptide hormones cannot penetrate target cells and have to bind to membrane receptors, necessitating the use of a second messenger inside the cell. Explain all the steps involved when calcium acts as a second messenger. (10)

QUESTION 2

Explain the effect elevated circulating levels of cortisol, a steroid hormone from the adrenal cortex, would have on the pituitary secretion of ACTH. (2)

QUESTION 3

During this semester, you studied the control systems that maintain homeostasis in the body, namely the endocrine system and the nervous system. Compare endocrine communication and synaptic communication in terms of mode of transmission, chemical mediators involved and the distribution of effects. (8)

QUESTION 4

Discuss the synthesis of the hormones Triiodothyronine and Tetraiodothyronine. (10)

Subtotal /30

SECTION B

QUESTION 1

Multiple action potentials can arrive at a postsynaptic cell. Compare temporal and spatial summation and distinguish between the summation of EPSPs and IPSPs. (10)

QUESTION 2

Sarah was in a car accident. As a result she obtained a deep cut in her arm and subsequent damage to a number of neurons. Discuss how these neurons will respond to the injury. (8)

QUESTION 3

Discuss the classification of reflexes in terms of development, response, complexity of the circuit as well as the processing site. (8)

QUESTION 4

Discuss the formation, circulation and functions of the cerebrospinal fluid. (14)

QUESTION 5

Explain the physiological importance of the blood-brain barrier and the blood-CSF-barrier. (10)

QUESTION 6

With regards to gustation, explain the different receptor mechanisms involved with salt and sour tastes compared to sweet, bitter and umami tastes. (10)

QUESTION 7

As a result of pressure on her spinal cord, Thato cannot feel fine touch or pressure on her lower limbs. Which spinal tract is being compressed? (3)

QUESTION 8

When you prepared for this exam, you studied the work through repetition so that the information could be stored in your long-term memory. Explain the three cellular mechanisms involved in memory formation and storage. (7)

Subtotal /70