UNIVERSITY
OF
JOHANNESBURG

PROGRAM : **B.OPTOM & B. CUR**

SUBJECT : **HUMAN PHYSIOLOGY II**

CODE : **Optometry: HPH 02A2**
     Nursing   : HPH 2A10 & HPH 2A20

DATE : JULY SUPPLEMENTARY EXAMINATION
     20 JULY 2017

TIME : 15h00

DURATION : 180 minutes

WEIGHT : 50: 50

TOTAL MARKS : 50 x 2 =100

EXAMINER : P.C. DE LANGE- JACOBS

MODERATOR : S. EAGLETON

NUMBER OF PAGES : 5 PAGES

REQUIREMENTS : 2 X EXAMINATION SCRIPT

INSTRUCTIONS TO CANDIDATES:

1. THIS QUESTION PAPER MUST BE RETURNED WITH YOUR EXAMINATION ANSWER SCRIPTS.
2. PLEASE ANSWER SECTION A & B in SEPARATE BOOKS
_____

SECTION A
Optometry: HPH 02A2   **MARKS   : 50**
Nursing   : HPH 2A10   **DURATION: 90 minutes**
_____

QUESTION 1

Proteins are the most abundant organic components of the human body and in many ways the most important.

1.1 Name and define the special property of water that is involved in the formation of proteins and describe the formation of proteins.   6 x ½ = (3)

1.2 Distinguish among the four levels of structural complexity of proteins.

4 x 1 = (4)

1.3 Name and describe the role of the organelles of the endomembrane system in the synthesis and processing of proteins.   8 x ½ = (4)

1.4 Name and discuss three types of membrane proteins that are involved in the transport of substances across the plasma membrane. Include one example for each type to explain their function.   12 x ½ = (6)

[17]

QUESTION 2

2.1 Discuss three factors that influence skin colour.   12 x ½ = (6)

2.2. Name two diseases that produce secondary effects on skin colour and pigmentation.

2 x ½ = (1)

[7]

QUESTION 3

Discuss the following:

3.1 The epiphyseal plate   2 x ½ = (1)

3.2 The functions of osteoprogenitors cells and osteoblasts   4 x ½ = (2)

3.3 Paget's disease   4 x ½ = (2)

3.4 The **three** ways in which calcitonin decrease blood calcium levels.

                                                            3 x 1 = (3)

3.5 The histology of articular cartilage   4 x ½ = (2)

                                                            [10]

QUESTION 4

4.1 Explain how the pattern of energy production and use changes as the level of
    muscular activity increases.   12 x ½ = (6)

4.2 Describe in detail the contraction cycle of a skeletal muscle fibre.   10 x 1 = (10)
                                                            [16]

SECTION A: TOTAL MARKS: 50

SECTION B
Optometry: HPH 02A2   MARKS   : 50
Nursing   : HPH 2A20   DURATION: 90 minutes

_____
Answer this section in a separate book

QUESTION 1

Use only diagrams with explanatory annotations to explain how a resting membrane

potential is established and maintained.   16 x ½ = **[8]**

QUESTION 2

2.1 Explain the role of astrocytes in maintaining the blood-brain barrier.

4 x ½ = (2)

2.2 List four functions of the astrocytes other than the one mentioned in 2.1.

4 x 1= (4)

2.3 Describe the main function of the ependymal cells.   (1)

2.4 Compare and contrast the ependymal with typical epithelium.   3 x 1 = (3)

[10]

QUESTION 3

The pattern of interaction among neurons provides clues to the functional characteristics of neuronal pools. List, explain and provide a specific example for each of the different circuit patterns.   18 x ½ = **[9]**

QUESTION 4

Use only a flow diagram to describe the sequence of events from the moment of

detection of a crude touch stimulus up till the moment of perception.   16 x ½ = **[8]**

QUESTION 5

5.1 The hypothalamus:

 5.1.1 List 6 functions of the hypothalamus.   6 x ½ = (3)

 5.1.2 Explain the connection between the hypothalamus, autonomic function and

  psychosomatic illnesses.   3 x 1 = (3)

5.2 Explain Autonomic tone   (1)

5.3 Define dual innervation   (1)

[8]

QUESTION 6

Describe in detail the mechanisms involved in gustatory reception.   14 x ½ = **[7]**

SECTION B: TOTAL MARKS: 50