



<u>PROGRAM</u>	: B.OPTOM & B. CUR
<u>SUBJECT</u>	: HUMAN PHYSIOLOGY II
<u>CODE</u>	: Optometry: HPH 02A2 Nursing : HPH 2A10 & HPH 2A20
<u>DATE</u>	: JULY SUPPLEMENTARY EXAMINATION 19 JULY 2018
<u>TIME</u>	: 15h00
<u>DURATION</u>	: 180 minutes
<u>WEIGHT</u>	: 50: 50
<u>TOTAL MARKS</u>	: 50 x 2 =100
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<u>EXAMINER</u>	: P.C. DE LANGE- JACOBS
<u>MODERATOR</u>	: V. THAVER
<u>NUMBER OF PAGES</u>	: 6 PAGES
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<u>REQUIREMENTS</u>	: 2 X EXAMINATION SCRIPT
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INSTRUCTIONS TO CANDIDATES:

1. THIS QUESTION PAPER MUST BE RETURNED WITH YOUR EXAMINATION ANSWER SCRIPTS.
 2. PLEASE ANSWER SECTION A & B in SEPARATE BOOKS
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SECTION A**Optometry: HPH 02A2****Nursing : HPH 2A10****MARKS : 50****DURATION: 90 minutes**

QUESTION 1

Vesicular transport is an important mechanism to move substances across the plasma membrane.

1.1 Name and briefly explain the **three** major types of endocytosis. (5)

1.2 Define exocytosis. (1)

1.3 Explain the intracellular process that precedes exocytosis. $6 \times \frac{1}{2} = (3)$

1.4 Give **two** examples of where exocytosis occur in the body. $2 \times \frac{1}{2} = (1)$

[10]

QUESTION 2

Define the important characteristic of polarity of epithelium tissue and then provide a comprehensive discussion on this concept as it occurs in the skin.

[8]

QUESTION 3

3.1 Discuss why the correct balance in the activities of the different types of bone cells is so important. Please include reference to at least **two** bone diseases. (3)

3.2 Use a flow diagram to explain the hormonal control and the effect **on only the bone cells** in the homeostatic regulation of blood calcium levels. $12 \times \frac{1}{2} = (6)$

3.3 Explain to a mother of a new born baby why the fontanel in the baby's skull will disappear in a year or two. (2)

[11]

3/...

QUESTION 4

4.1 Describe in detail the contraction cycle of a skeletal muscle fibre. (10)

4.2 ATP manufactured during aerobic and anaerobic respiration provides the energy needed for muscle contraction.

4.2.1 Name the main processes in anaerobic respiration, then indicate the site of the process, the substrate and net gain in energy (ATP production).

4 x ½ = (2)

4.2.2 Explain the pattern of energy production and use during peak levels of muscular activity.

6 x ½ = (3)

[15]

QUESTION 5

5.1 Distinguish among the four levels of structural complexity of proteins. (4)

5.2 Give **one example each** for the skin and mucosa where exfoliative cytology is used for diagnostic tests.

2 x ½ = (1)

5.3 Explain the underlying physiological cause for the disease: Vitiligo. (1)

[6]

SECTION A: TOTAL MARKS: 50

SECTION B**Optometry: HPH 02A2****Nursing : HPH 2A20****MARKS : 50****DURATION: 90 minutes****QUESTION 1**

1.1 Acetylcholine (Ach) is released at neuromuscular junctions in a skeletal muscle. Use only diagrams to explain what the effect will be on the postsynaptic membrane.

16 x ½ = (8)

1.2 Will there be a different effect on the postsynaptic membrane if Acetylcholine (Ach) is released at a neuromuscular junctions in the heart? Briefly explain your answer in words.

(3)

[11]

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 ½ = (2)

2.3 Briefly discuss one example where the blood-brain barrier is not intact.

2 x ½ = (1)

2.4 Explain axoplasmic transport.

4 x ½ = (2)

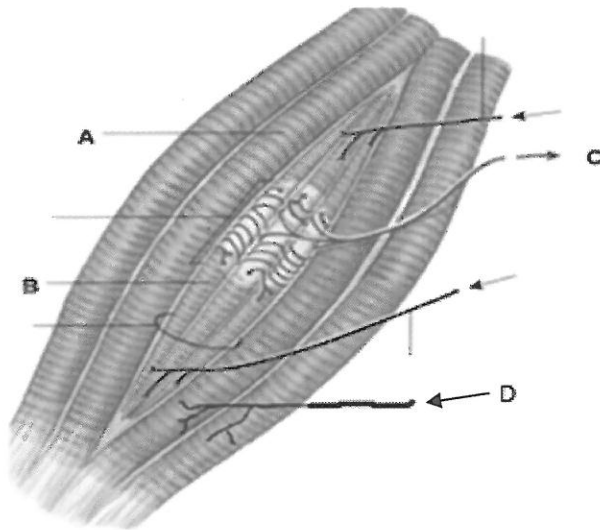
2.5 Discuss an example of a clinical condition directly related to axoplasmic transport.

2 x ½ = (1)

[8]

QUESTION 3

3.1 Refer to the figure below to answer the following questions:



3.1.1 Identify this structure. (1)

3.1.2 Provide labels as indicated (A, B, C, D): Write only the letter and your answer on your answer sheet. $4 \times \frac{1}{2} = (2)$

3.1.3 Explain the function of this structure by referring to a specific reflex example. (2)

3.2 Discuss the relevance of the plantar reflex and Babinski sign. $4 \times \frac{1}{2} = (2)$
[7]

QUESTION 4

4.1 Explain the difference between slow- and fast-adapting receptors. $6 \times \frac{1}{2} = (3)$

4.2 Compare and contrast the lateral spinothalamic tract to the spinocerebellar pathway in table format. $12 \times \frac{1}{2} = (6)$
[9]

QUESTION 5

Olfaction, the sense of smell, is made possible by the paired olfactory organs.

5.1 Explain olfactory reception, transduction and pathway. $14 \times \frac{1}{2} = (7)$

5.2 Although the olfactory receptors are very sensitive, it do not guarantee an awareness because of convergence, inhibition and adaptation. Explain the two underlined concepts.

(2)

5.3 Explain the cellular mechanisms of long-term memory formation.

(3)

5.4 Explain the link between odours and our emotions and memories.

(3)

[15]

SECTION B: TOTAL MARKS: 50
