UNIVERSITY OF JOHANNESBURG

PROGRAM	:	*OPTOMETRY III*
SUBJECT	:	**OCULAR PHYSIOLOGY**
CODE	:	**OAF03B3**
DATE	:	NOVEMBER EXAMINATION 24 NOVEMBER 2016
DURATION	:	180 minutes
WEIGHT	:	50: 50
TOTAL MARKS	:	100
EXAMINERS	:	MR. T.T. NYAKUDYA : MRS P.C. DE LANGE-JACOBS
MODERATORS	:	MRS P.C. DE LANGE-JACOBS : MR. T.T. NYAKUDYA
NUMBER OF PAGES	:	4 PAGES
INSTRUCTIONS	:	THIS QUESTION PAPER MUST BE RETURNED WITH THE EXAMINATION SCRIPTS
REQUIREMENTS	:	1 X EXAMINATION SCRIPT

INSTRUCTIONS TO CANDIDATES:

1. THIS PAPER CONSISTS OF TWO SECTIONS**.**

   SECTIONS A MUST BE ANSWERED IN A **SEPARATE** EXAMINATION SCRIPT.

   SECTIONS B MUST BE ANSWERED IN A **SEPARATE** EXAMINATION SCRIPTS

2. **PLEASE LABEL THE COVER OF EACH EXAMINATION SCRIPT, SECTION A, AND B**

3. THIS QUESTION PAPER MUST BE RETURNED WITH YOUR EXAMINATION SCRIPTS.

SECTION A

Answer this section in a SEPARATE answer script. Ensure that you number your answers exactly as the questions are numbered.

QUESTION ONE – THE EYELIDS

1.1 The main function of the eyelids is to protect the eye. Explain the different levels of protection of the eye by the eyelids. (10)

[10]

QUESTION TWO – LACRIMAL APPARATUS

2.1 Describe any five components that are regulated and contribute to the chemical composition of the tear film. (5)

2.2 Give a detailed description of the Holy and Lemp mechanism which has been proposed as a mechanism to explain tear film thinning and breaking. In your description highlight the main limitations of this mechanism. (10)

[15]

QUESTION THREE – OCULAR BLOOD FLOW

3.1 Explain the role of perfusion pressure, concentration of oxygen and carbon-dioxide in ocular blood flow. (10)

[10]

QUESTION FOUR – PHYSIOLOGY OF THE CORNEA

4.1 Corneal transparency has to be maintained in order to obtain a sharp image on the retina. Identify and describe **FIVE** physical factors that affect corneal transparency. (10)

4.2 Describe the factors influencing the penetration of drugs through the cornea. (5)

[15]

SUBTOTAL SECTION A: 50

SECTION B

Answer this section in a SEPARATE answer script. Ensure that you number your answers exactly as the questions are numbered.

QUESTION 1

1.1 Discuss in detail the nourishment of the crystalline lens which is important for its focusing power and transparency. Explain in detail how glucose is used as primary energy source. (9)

1.2 Explain the biochemical changes that lead to the development of diabetic cataracts. (5)

[14]

QUESTION 2

2.1 Discuss the different flow paths of the aqueous humour that establish and influence the Intra ocular pressure. 8 x ½ = (4)

2.2 Provide suitable equations to **explain** the different pressures that contribute to the intra-ocular pressures. 3 x 2 = (6)

[10]

QUESTION 3

3.1 Compare and contrast the Diamond- Bossert Model to the Gibbs-Donnan effect.

12 x ½ = **[6]**

QUESTION 4

4.1 Discuss Posterior Vitreous Detachment (PVD). 8 x ½ = (4)

4.2 Name **two** cell types that occur in the vitreous humour 2 x ½ = (1)

4.3 Name the **two** components of the vitreous that are responsible for its structure, volume and transparency. 2 x ½ = (1)

[6]

QUESTION 5

Distinguish between the two different types of blocking agents that effect the contraction of the extra-ocular muscles by working **postsynaptically.** 8 x ½ = **[4]**

QUESTION 6

6.1 Describe the general structure of the photoreceptors in the eye. 4 x ½ = (2)

6.2 Describe structure of the visual pigment involve in photoreception. 4 x ½ = (2)

6.3 Explain the process of photoreception during the active state in light. 12 x ½ = (6)

[10]

SUBTOTAL SECTION B: 50
TOTAL: 100