



PROGRAM: *NURSING AND OPTOMETRY*

SUBJECT: PHYSIOLOGY 2

CODE : NURSING - HPH 2B10 AND 2B20
OPTOMETRY - HPH 02B2 (HPH20B2)

DATE : EXAMINATION 30 NOVEMBER 2016

DURATION: 180 Minutes (90 minutes per section)

WEIGHT : 50:50

TOTAL MARKS: SECTION A = 60
SECTION B = 60

EXAMINERS : DR S EAGLETON

MODERATORS : MRS P DE LANGE-JACOBS

NUMBER OF PAGES : 5 PAGES

REQUIREMENTS: 1 x EXAMINATION SCRIPT

CALCULATOR: CALCULATORS PERMITTED (CELL PHONE MAY NOT BE USED)

SECTION A**NURSING HPH 2B10****OPTOMETRY HPH 02B2**

Answer this section in the answer book provided. Number the questions exactly as they are numbered on the question paper.

Keep subsections of questions together.

Question 1 Endocrine system

- 1.1 The following questions are about the water soluble hormones:
- 1.1.1 Name the different classes of water soluble hormones. 4 x ½ = (2)
- 1.1.2 Describe how water soluble hormones recognize and activate their target and what the response of the effector will be. 12 x ½ = (6)
- 1.2 Discuss the hormonal control of blood glucose levels in the body. 8 x ½ = (4)
- 1.3 Explain the role of ADH (anti diuretic hormone) during dehydration of the body. 6 x ½ = (3)

[15]

Question 2 Blood

- 2.1 Describe the recycling (turnover) of red blood cells. 10 x ½ = (5)
- 2.2 Name five types of white blood cells and give one function for each type. 10 x ½ = (5)

[10]

Question 3 Heart

- 3.1 Relate the electrical events as seen on an ECG to the mechanical events of heart. 6 x ½ = (3)
- 3.2 Distinguish between isovolumetric contraction and isovolumetric relaxation during the cardiac cycle. (2)
- 3.3 Explain why hypertension is 'hard on the heart'. (2)
- 3.2.1 Define cardiac output. (1)
- 3.2.2 Briefly explain the four primary factors that play a role in regulating the cardiac output. 8 x ½ = (4)
- 3.3 Explain how each of the following factors affect the cardiac output (CO):
- 3.3.1 An increase in blood calcium levels (1½)
- 3.3.2 An increase in venous return to the heart (1½)

[15]

Question 4 Blood vessels

- 4.1.1 Explain how the nett filtration pressure (NFP) at the capillary bed is calculated. (4)
- 4.1.2 Explain the effect of a positive and negative NFP at capillary bed. (1)
- 4.2 Discuss the role of the lymphatic system in preventing oedema. (3)
- 4.3 Outline the events of the reflex response to restore homeostasis when there is an increase in the carbon dioxide and a drop in pH and oxygen levels in the body. $14 \times \frac{1}{2} = (7)$

[15]**Question 5 Lymph**

- 5.1 Relate the structure of the lymph node to its functions. (5)

[5]**TOTAL SECTION A = 60**

SECTION B**NURSING HPH 2B20****OPTOMETRY HPH 02B2 (HPH20B2)**

Answer this section in the answer book provided. Number the questions exactly as they are numbered on the question paper.

Keep subsections of questions together.

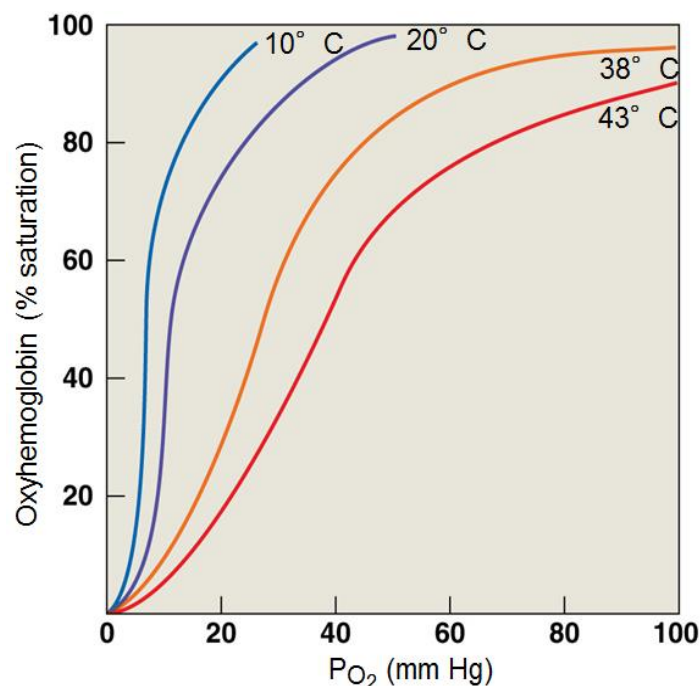
Question 1 Immune system

- 1.1 Explain how Class II MHC (major histocompatibility complex) proteins will be present foreign antigens. (5)
- 1.2 Which defense cells will be activated by Class II MHC proteins? (1)
- 1.3 Discuss the secretion and functions of three types of interferons. $6 \times \frac{1}{2} = (3)$
- 1.4 Outline six (6) ways in which antigen-antibody complexes function. (6)

[15]

Question 2 Respiratory system

- 2.1 Describe four (4) factors that will play a role to ensure efficient gas exchange in the lungs. (4)
- 2.2 Use the graph to explain the role of temperature in oxygen delivery to the tissues. $6 \times \frac{1}{2} = (3)$



- 2.3 Distinguish between the effects of hypoventilation and hyperventilation on the body. $6 \times \frac{1}{2} = (3)$

[10]

Question 3 Digestive system

- 3.1 Explain the neural and hormonal control of digestion related to the cephalic phase of gastric digestion. 12 x ½ = (6)
- 3.2 Relate the functions of the pancreatic acinar cells to the digestion of carbohydrates and proteins in the small intestines. 8 x ½ = (4)
- 3.3 Relate the structure of the liver lobule to its metabolic functions. (5)

[15]**Question 4 Urinary system**

- 4.1 Explain the processes involved in urine formation. (10)

[10]**Question 5 Reproductive system**

- 5.1 Outline the events during the ovarian cycle also indicating the hormonal regulation of the cycle as well as the hormones produced by the ovarian structures. 20 x ½ = (10)

[10]**TOTAL SECTION B = 60**