PROGRAM:	***NURSING AND OPTOMETRY***
SUBJECT:	**PHYSIOLOGY 2**
CODE :	**NURSING - HPH 2B10 AND 2B20** **OPTOMETRY - HPH 02B2**
DATE :	**EXAMINATION 22 NOVEMBER 2017**
DURATION:	**180 Minutes (90 minutes per section)**
WEIGHT :	**50:50**
TOTAL MARKS:	**SECTION A = 50** **SECTION B = 50**

EXAMINERS:	**: DR S EAGLETON**
MODERATOR	**: MRS P DE LANGE-JACOBS**
NUMBER OF PAGES	**: 8 PAGES**

INSTRUCTIONS:	**YOU CAN KEEP THE QUESTION PAPER**
REQUIREMENTS:	**2 x EXAMINATION SCRIPTS**
CALCULATORS	**CALCULATORS ALLOWED (CELL PHONE MAY NOT BE USED AS A CALCULATOR)**

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

1.1 Describe the cellular response when the cell is activated by a steroid hormone. 10 x ½ = (5)

1.2 Explain the role of parathyroid hormone in regulating plasma calcium levels. 4 x ½ = (2)

1.3 State three reasons why it is important to maintain plasma calcium levels. (3)

[10]

Question 2

2.1 Explain the role of the macrophages during the recycling of a red blood cell. (4)

2.2 Name and give one function for each of the 'main' types of plasma proteins. (3)

2.3 Explain **why** the blood type O^- is referred to as the 'universal donor'. (1½)

2.4 Match the leucocyte with its function:

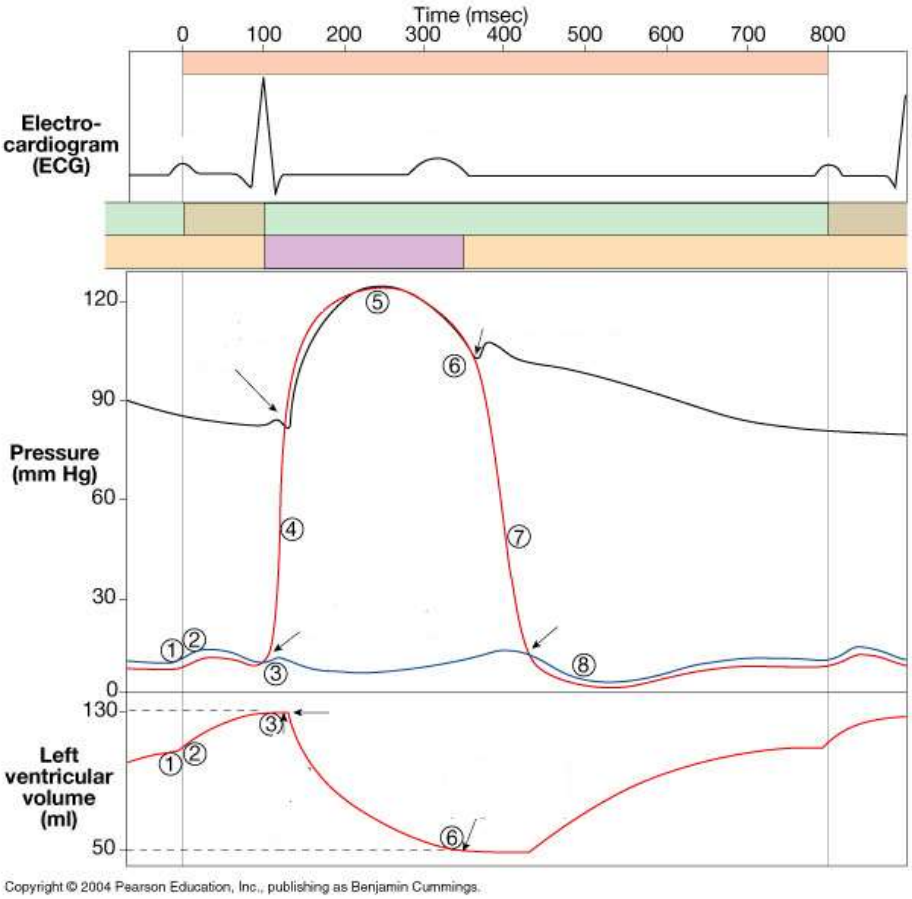
	Function	Leucocyte
2.4.1	Enter peripheral tissues and become macrophages	Neutrophil
2.4.2	Attack large parasites	Basophil
2.4.3	Very active, first to attack bacteria	Eosinophil
		Monocyte
		Lymphocyte

3 x ½ = (1½)

[10]

Question 3

Use the graph to answer the following questions:



3.1 Explain the cardiac events that occur during the phase numbered 4 on the pressure graph. (3)

3.2 Relate the electric events (ECG) to the mechanical events at point 3 on the pressure graph. (4)

3.3 Use the graph to calculate the stroke volume. (Show all formulae and calculations). (2)

3.4 Which side of the heart is represented by this graph? (1)

[10]

Question 4

4.1 Define MAP (mean arterial pressure). (1)

4.2 Calculate the MAP for a person with a 'normal' blood pressure. (Write down the equation and show all calculations). (2)

4.3 Use a flow diagram to illustrate the reflex response that restore homeostasis when there is an increase in CO_2 and a decrease in pH and O_2 in the body. 14 x ½ = (7)

[10]

Question 5

5.1 Describe antigen presentation by MHC Class 1 proteins. (6)

5.2 Which of the **non-specific** defense mechanisms would be involved in the following events? – Explain why you chose the specific mechanism.

5.2.1 A viral infection (1)

5.2.2 Cancer (1)

5.2.3 Destruction of an antibody-coated pathogen (1)

5.2.4 Bacterial infection (1)

[10]

Total Section A = [50]

Answer this section in a new answer script

SECTION B

NURSING HPH 2B20

OPTOMETRY HPH 02B2

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

SHORT ANSWERS

Use the key to answer the questions in the answer book provided - Each option can be used once or not at all.

You only need to write the question number and your answer in the answer script provided.

Key

- acrosomal cap
- apnea
- capillary
- dead space volume
- digestion
- emulsification
- endometrium
- epiglottis
- eupnea
- functional zone
- goblet cells
- head
- lacteal
- macrophages
- mass movements
- menarch
- menopause
- menstruation
- microphages
- myometrium
- normal peristalsis
- ovarian follicles
- peritubular capillaries
- plicae
- proliferation
- residual volume
- respirometer
- rugae
- spermatogenesis
- spermiogenesis
- spirometer
- ureter
- urethra
- uterine follicles
- uvula
- vasa recta
- zona ovaria
- zona pellucida

1) "Dust cells" that wander in and out of the alveoli, picking up bacteria and other debris, are actually _____.

2) The air that remains in the conducting zone passageways and never reaches the alveoli is called the _____.

3) Respiratory capacities are measured with a _____.

4) Normal breathing is called _____.

5) The fleshy, fingerlike projection of the soft palate, which extends downward from its posterior edge, is the _____.

6) Folds in the stomach lining that allow for expansion are called _____.

7) The modified lymphatic capillary found in each villus is called a _____.

8) The cells in the large intestine that produce large amounts of mucus to aid in the passage of feces to the end of the digestive tract are called _____.

9) Bile breaks large fat globules into smaller ones in a process known as _____.

10) Long, slow-moving but powerful contractile waves of the colon that occur three to four times a day are called _____.

11) Urine is carried from the urinary bladder to the outside of the body by the _____.

12) The _____ is a capillary that surrounds the loop of Henle of Juxtaglomerular nephrons.

13) The _____ is the part of the sperm that contains the enzymes necessary for fertilization.

14) Spermatids are produced by the process of _____.

15) The _____ is the inner lining of the uterus.

16) _____ are specialized structures within an ovary that contain an oocyte.

17) The _____ is the glycogen rich space between the developing oocyte and the innermost follicle cells.

18) _____ is the process of sloughing off the old functional layer of the endometrium.

19) The _____ is the zone that undergoes the cyclic changes of the menstrual cycle.

20) The cessation of menstruation that occurs during midlife is called _____.

20 X ½ = [10]

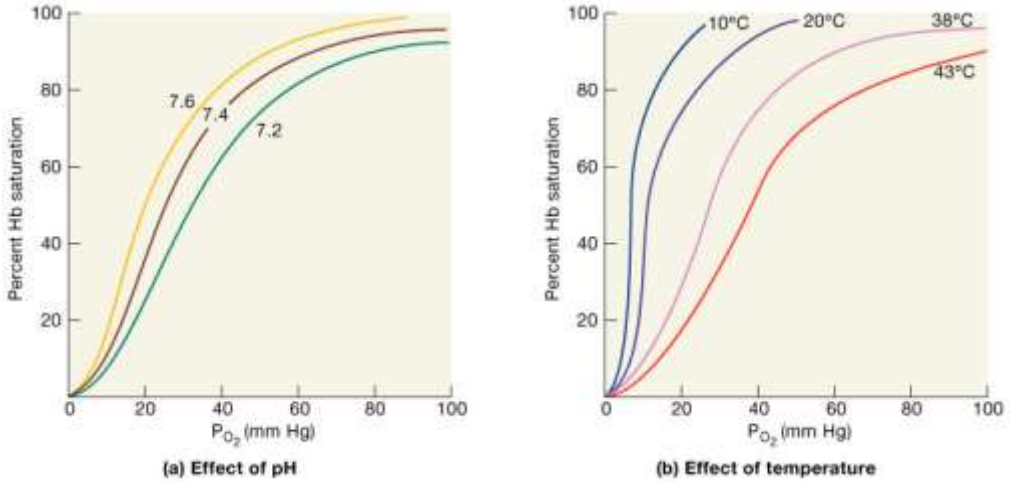
Open ended questions

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

Keep subsections of questions together.

Question 1

1.1 Use the haemoglobin saturation curves to explain how pH and temperature affects oxygen delivery to tissue. (3)



1.2 Describe how CO_2 will be transported to the lungs following internal respiration. (6)

1.3 Use the data to calculate the **residual volume** (RV) (show all calculations). (1)

Tidal volume (TV)= 500 ml
Inspiratory capacity (IC)= 1700 ml
Vital capacity (VC)= 4800 ml
Total lung volume (TLV)= 6000 ml

[10]

Question 2

2.1 Fully explain how gastric **secretions** and **motility** in the stomach are regulated during the gastric phase. (8)

2.2 The duodenum secretes both secretin and cholecystokinin (CCK). What will be the stimulus for the secretion of each of these hormones? (2)

[10]

Question 3

3.1 Use a flow diagram to illustrate the role of the Juxtaglomerular apparatus in the regulation of the blood pressure and blood volume. 20 x ½ = (10)

[10]

Question 4

4.1 Explain five functions of the sustentacular cells in the male reproductive system. (5)

4.2 Describe the hormonal control of the uterine cycle. (5)

[10]

Total = [50]