



**PROGRAM** : *BIOKINETICS*

**SUBJECT** : **ANATOMY AND PHYSIOLOGY I**

**CODE** : **AAP01Y1**

**DATE** : NOVEMBER EXAMINATION  
NOVEMBER 2016

**DURATION** : 180 MINUTES

**WEIGHT** : 50 : 50

**TOTAL MARKS** : 50

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**EXAMINERS** : I. PATEL  
E. SWANEPOEL  
B. THOMAS  
N. XHAKAZA

**MODERATORS** : P. NKOMOZEPI

**NUMBER OF PAGES** : 16 PAGES

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**INSTRUCTIONS** : QUESTION PAPER MUST BE HANDED IN

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**REQUIREMENTS** : 1 X MULTIPLE CHOICE ANSWER SHEET  
4 X EXAMINATION SCRIPTS

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**INSTRUCTIONS TO CANDIDATES:**

1. THIS PAPER CONSISTS OF 5 SECTIONS.
  2. SECTION A MUST BE COMPLETED ON THE MULTIPLE CHOICE ANSWER SHEET PROVIDED.
  3. SECTIONS B TO E MUST EACH BE ANSWERED IN A SEPARATE EXAMINATION SCRIPT PROVIDED.
  4. MARK ALLOCATION FOR SECTION A: 1 MARK PER QUESTION.
  5. MARK ALLOCATION FOR SECTIONS B TO E: ½ MARK PER FACT UNLESS INDICATED OTHERWISE.
  6. THIS QUESTION PAPER MUST BE RETURNED WITH ALL YOUR EXAMINATION ANSWER SCRIPTS.
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**SECTION A: MULTIPLE CHOICE QUESTIONS**

Multiple choice questions available on request

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**SECTION A SUBTOTAL: 40**

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**SECTION B: ANATOMY (E. Swanepoel)**

(Endocrine system, Senses, Cardiovascular system and Urinary system)

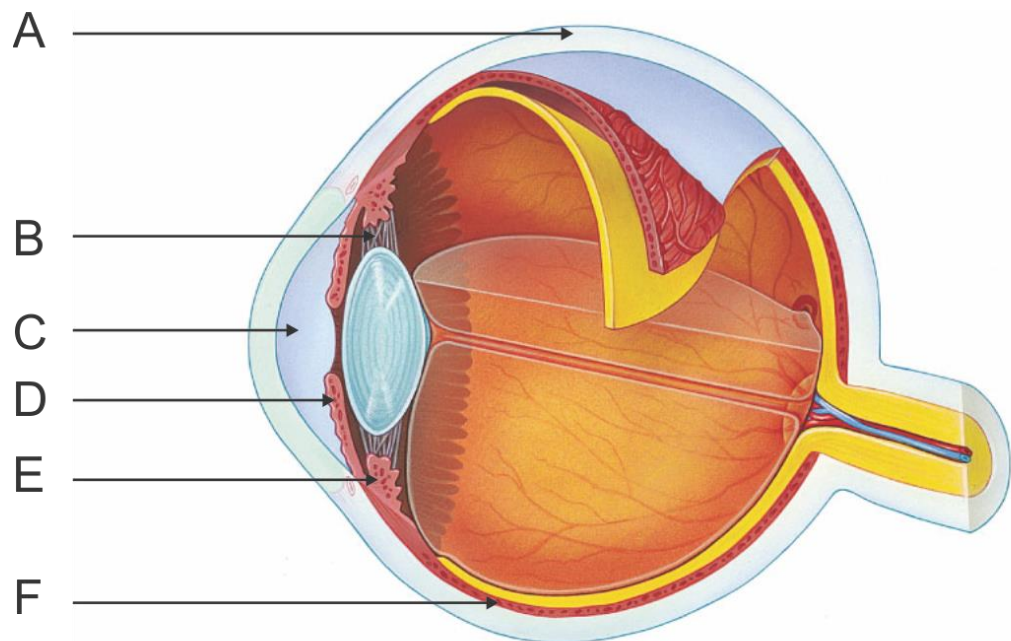
**QUESTION 1**

Complete the table below by writing the number and the correct answer in your answer script:

Gland	Location	Macroscopic anatomy	Type of cells
1.1 (½)	1.2 (1½)	1.3 (1½)	Follicular cells Parafollicular cells
1.4 (½)	1.5 (1)	Usually 4 small glands	1.6 (1)

**[6]****QUESTION 2**

Refer to Figure 1 and answer the following questions:

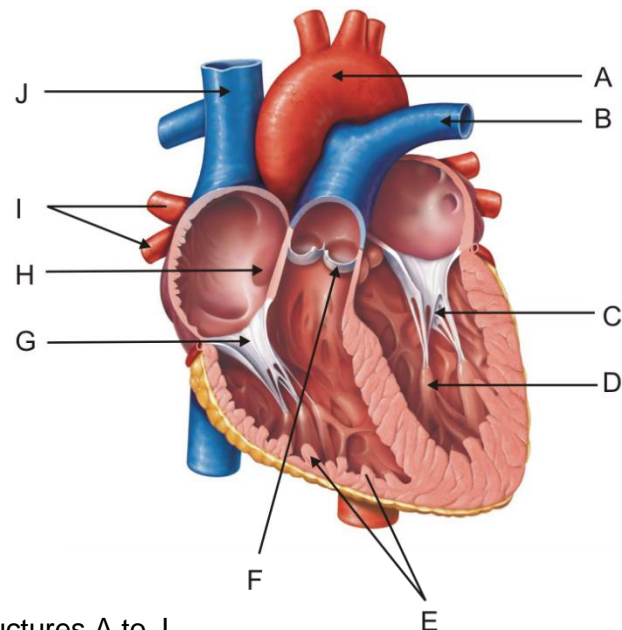
**FIGURE 1**

- 2.1 Provide labels for structures A to F. (3)  
 2.2 Name the type of neuron found in the retina. (½)  
 2.3 Briefly describe the term "Blind spot". (1½)

**[5]**

**QUESTION 3**

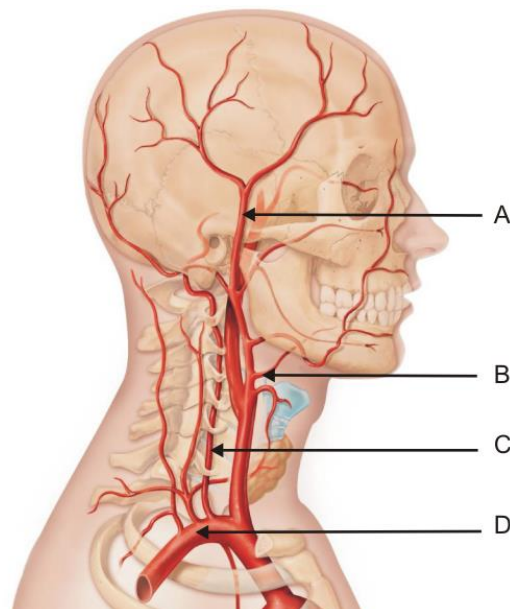
Refer to Figure 2 and answer the following questions:

**FIGURE 2**

- 3.1 Provide labels for structures A to J. (5)
- 3.2 Does structure B contain oxygenated or deoxygenated blood? (½)
- 3.3 Name the embryonic/fetal structure that structure H is a remnant of. (½)
- 3.4 Write a short note on the histology (micro-anatomy) of the heart wall. (3)

**[9]****QUESTION 4**

Refer to Figure 3 and provide labels for arteries A to D.

**[2]****FIGURE 3****QUESTION 4**

Describe the macroscopic anatomy of the bladder.

**[5]****SECTION B SUBTOTAL: 27**

**SECTION C: ANATOMY (N. Xhakaza)**

(Nervous system, Respiratory system and Muscles)

**QUESTION 1**

By means of a flow diagram, indicate the course of CSF from the lateral ventricles to the subarachnoid space of the brain.

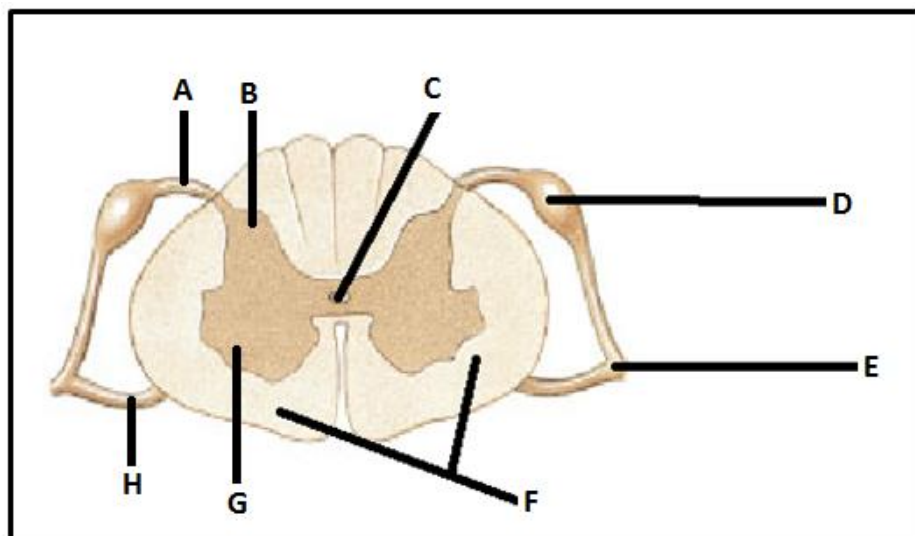
**[3]****QUESTION 2**

Complete the table below by writing the number and the correct answer in your answer script.

Cranial nerve	Primary function	Foramen	Structure/s innervated
Hypoglossal nerve	2.1 (½)	2.2 (½)	2.3 (½)
2.4 (½)	2.5 (½)	2.6 (½)	Lateral rectus
2.7 (½)	2.8 (½)	2.9 (½)	Retina of the eye

**[4½]****QUESTION 3**

Refer to Figure 1 and provide the labels for structures A to H.

**[4]****FIGURE 1****QUESTION 4**

Name the epithelial lining of each one of the following structures of the respiratory system:

- |     |                    |     |
|-----|--------------------|-----|
| 4.1 | Oropharynx         | (½) |
| 4.2 | Trachea            | (½) |
| 4.3 | Larger bronchioles | (½) |
| 4.4 | Alveoli            | (½) |

**[2]**

6/...

**QUESTION 5**

Write a short note on the cricoid cartilage.

**[4]**

**QUESTION 6**

6.1 Name four ways in which skeletal muscles are classified according to the organization of fascicles. (2)

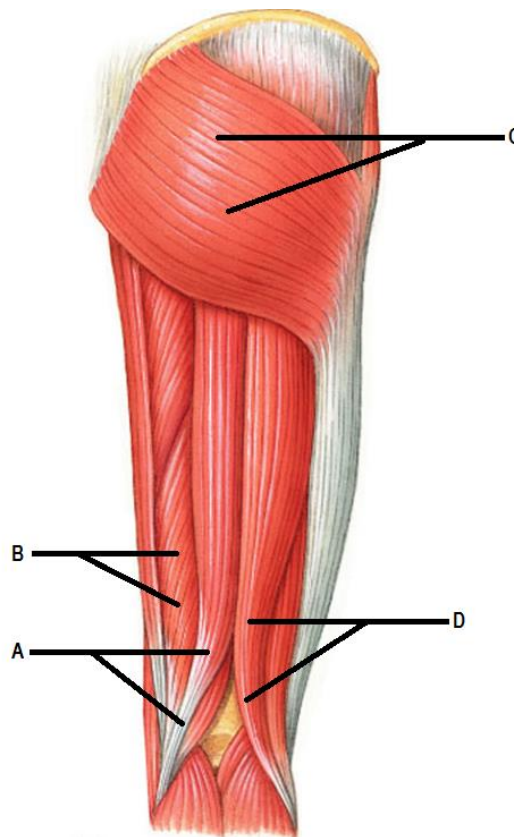
6.2 Name any three muscles that move the digits of the hand. (1½)

**[3½]**

**QUESTION 7**

Refer to Figure 2 and provide labels for structures A-D. **[2]**

**FIGURE 2**



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**SECTION C SUBTOTAL: 23**

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**SECTION D: PHYSIOLOGY (I. Patel)**

(Chemistry, Cell Osseous tissue, Skin, Nervous system, Endocrine system and Senses)

**QUESTION 1: Intro to Physiology**

Name and define the **FIVE** components of any homeostatic regulatory mechanism. **[5]**

**QUESTION 2: Chemistry**

- 2.1 Explain the four properties of water that illustrate its biological importance to humans. (4)
- 2.2 Describe the difference between a covalent bond and an ionic bond. (2)
- [6]**

**QUESTION 3: Cell**

Describe the **FOUR** passive transport mechanisms that occur across the cell membrane. **[4]**

**QUESTION 4: Nervous System**

Describe the events that occur at a chemical synapse. **[5]**

**QUESTION 5: Endocrine System**

- 5.1 Describe the **THREE** mechanisms of control of endocrine secretion. (3)
- 5.2 State the names and **ONE** function of the hormones secreted by the posterior pituitary gland. (2)
- [5]**

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**SECTION C SUBTOTAL: 25**

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**SECTION E: PHYSIOLOGY (B. Thomas)**

(Muscle, Blood, Cardiovascular system, Respiratory system and Urinary system)

**QUESTION 1: Muscle**

- 1.1 Describe how the arrival of an action potential at the axon terminal leads to depolarization of the motor end plate. (3½)
- 1.2 Name the **three** phases of a muscle twitch. (1½)
- [5]**

**QUESTION 2: Blood**

Name the **five** types of leukocytes and provide one function for each. **[5]**

**QUESTION 3: Cardiovascular system**

- 3.1 List the components of the intrinsic conduction system of the heart. (3)
- 3.2 Discuss the pressure changes that occur during **isovolumetric ventricular relaxation**. Remember to mention the valves in your answer. (2)
- [5]**

**QUESTION 4: Respiratory system**

Describe the process of **inspiration** during eupnea. You may use a flow diagram to answer the question. **[5]**

**QUESTION 5: Urinary system**

- 5.1 Describe the countercurrent multiplication that occurs at the loop of Henlé. (3½)
- 5.2 Describe the effects of anti-diuretic hormone (ADH) on the nephron. (1½)
- [5]**

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**SECTION E SUBTOTAL: 25**

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**TOTAL MARKS: 140**

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