Summer Examination 2015

SLS100615N

Module Title Integrated Physiology
Level Four
Time Allowed Two hours

Instructions to students:
• Please enter your student number not your name on all answer booklets and the examination paper below.
• Answer ALL questions from SECTION A on the EXAMINATION PAPER.
• Answer ONE question from SECTION B in the ANSWER BOOKLET provided. Label each booklet clearly with the number of the question you are answering.
• Section A is worth 50%. Section B is worth 50%.
• Neither books nor notes may be taken into the examination.
• You may not remove this examination paper from the examination room. For all purposes the examination paper remains the property of The University of Northampton.

Student Number...........................................................................

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SECTION A

Answer all questions in Section A on the exam paper.

1. The diagram above is from a spirometer, showing the respiratory volumes. Label items a-g.  

(7 marks)

a. .................................................................

b. .................................................................

c. .................................................................

d. .................................................................

e. .................................................................

f. .................................................................

g. .................................................................
2. a. Describe the mechanical processes involved in respiration. (5 marks)

b. What is the motor nerve that innervates the diaphragm? (1 mark)

3. a. What is a haematocrit? (2 marks)
b. Give **THREE** factors that can affect the haematocrit.  
(3 marks)

i. ........................................................................................................................................

ii. ........................................................................................................................................

iii. ........................................................................................................................................

4. a. Briefly explain how haemoglobin carries CO$_2$ in the blood.  
(2 marks)

b. What effect does pH have on Oxygen dissociation in the blood?  
(3 marks)

c. What is myoglobin?  
(2 marks)
d. Explain the difference between myoglobin and haemoglobin.  

(3 marks)

5. a. Define the term; cardiac output.  

(1 mark)

b. Briefly explain the Frank-Starling rule of the heart.  

(4 marks)
c. How is the heart rate and blood pressure regulated by the Automatic Nervous System? (5 marks)

6. a. What is a sarcomere? (1 mark)

b. What is the sarcomere’s function? (2 marks)
c. Briefly explain the role of Calcium in muscle contraction.

(3 marks)

7. a. What is an electrocardiogram (ECG)?

(1 mark)

b. What does the QRS complex of the ECG represent?

(2 marks)

c. Give THREE ways that the ECG can be used clinically.

i. ........................................................................................................

(3 marks)

ii. ........................................................................................................

iii. ........................................................................................................
SECTION B

Answer ONE question in a separate answer booklet.

8. Explain how a resting membrane potential is produced and how action potentials are generated in neurones.

9. Using examples, describe how hormones contribute to the regulation of physiological processes.

10. Describe the processes involved in neurochemical transmission and how an electrical signal can pass between neurones.

END OF SECTION B
END OF PAPER