



Oxford Cambridge and RSA

# AS Level Physical Education

## H155/01 Physiological factors affecting performance

### Friday 18 May 2018 – Morning

### Time allowed: 1 hour 15 minutes



**You may use:**

- a scientific or graphical calculator



First name										
Last name										
Centre number						Candidate number				

#### INSTRUCTIONS

- Use black ink. HB pencil may be used for graphs and diagrams only. Please write clearly and in capital letters.
- Complete the boxes above with your name, centre number and candidate number.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the barcodes.

#### INFORMATION

- The total mark for this paper is **70**.
- The marks for each question are shown in brackets [ ].
- Quality of extended response will be assessed in the question marked with an asterisk (\*).
- This document consists of **12** pages.

**Section A**

Answer **all** the questions.

1 (a) Using the table below, name the main agonist muscle creating movement, the plane of movement and give a practical example for the following joint movements:

- Hip abduction
- Wrist flexion

<b>Joint movement</b>	<b>Main agonist muscle</b>	<b>Plane of movement</b>	<b>Practical example</b>
<b>Hip abduction</b>			
<b>Wrist flexion</b>			

[6]

(b) As a dance routine begins, the dancer's heart rate must be regulated. Thermoreceptors intrinsically detect an increase in temperature and act to increase heart rate.

Identify **two** neural receptors and explain how each regulates heart rate as the dance routine begins.

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[4]

(c) After a strenuous match a netball player is told to complete an active cool down.

Explain how venous return mechanisms can aid venous return and prevent blood pooling as part of the netball player's recovery.

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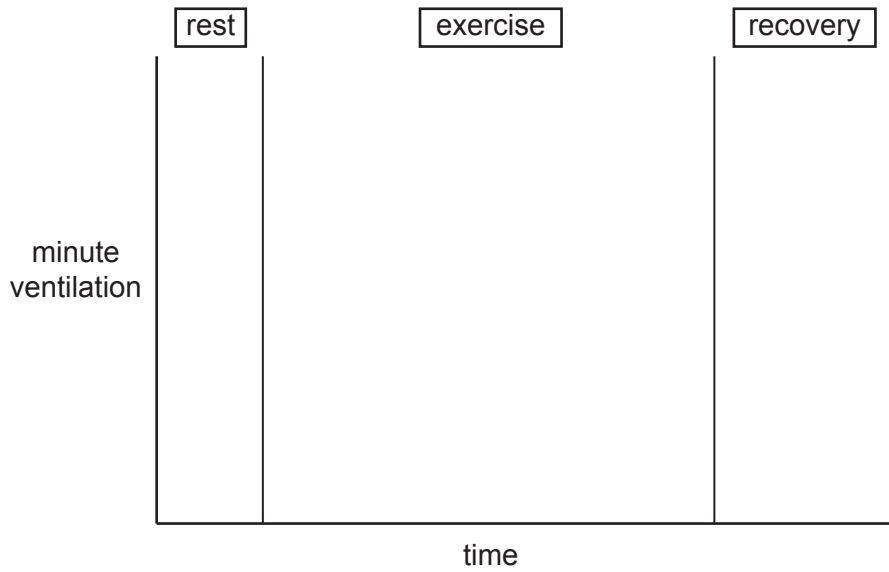
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(d) (i) Sketch a graph to show changes in minute ventilation at rest, during a 10-minute moderate intensity exercise session and for a 5-minute recovery period.



[4]

(ii) Given a minute ventilation of 80 litres/minute during exercise and a breathing frequency of 32 breaths/minute, calculate tidal volume showing your working.

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..... [2]

2 (a) (i) Which one of the following is **not** a function of proteins?

Put a tick (✓) in the box next to the correct answer.

- Growth of proteins
- Insulation of nerves
- Creation of enzymes
- Provider of energy

[1]

(ii) Identify a mineral responsible for the formation of haemoglobin.

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..... [1]

(iii) Identify **one** pharmacological aid that would enhance performance in weight lifting and describe **one** negative side-effect of this pharmacological aid.

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(b) Compare **two** tests used to evaluate aerobic capacity.

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(c) There are various types of training used to develop strength.

(i) Describe **one** weight training session to improve strength endurance for a rugby player.

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(ii) Outline the physiological adaptations that may occur as a result of strength training.

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(d) A gymnast will need excellent flexibility, explosive strength and strength endurance during a floor or apparatus routine.

(i) Explain, using practical examples from gymnastics, what is meant by dynamic and static flexibility.

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(ii) Outline, using examples, when explosive strength and strength endurance would be needed in gymnastics.

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- 3 (a) Compare what is meant by 'balanced forces' and 'unbalanced forces' and explain what is meant by the term 'net force'.

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- (b) (i) Define 'acceleration' and describe **three** ways in which a performer can increase their acceleration during sport or physical activity.

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- (ii) Calculate, to one decimal place, the average speed of a speed skater who covers a distance of 400 metres in 27 seconds.

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(c) (i) Define Newton's first law of motion.

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(ii) Explain why Newton's first law applies to a golf ball in the following situations:

A golf ball on the tee .....  
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A golf ball in flight at maximum velocity .....  
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(iii) Explain, using a sporting example, why Newton's third law of motion is also known as the law of reaction.

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(d) Wind tunnels are one of many new technologies used by sports scientists to enhance performance.

Outline **one** sporting situation where a wind tunnel is used to enhance performance, **two** benefits of this technology and **one** disadvantage.

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Section B

4\* Analyse the movements possible at the ankle joint using sporting examples of your choice, with reference to:

- Joint type
- Movements produced
- Plane of movement
- Agonist and antagonist muscles involved
- Types of muscle contraction taking place

Explain and evaluate second and third class levers, using the movements at the ankle in practical examples to support your answer. **[10]**

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**END OF QUESTION PAPER**

**ADDITIONAL ANSWER SPACE**

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

A large rectangular area with a solid vertical line on the left side and horizontal dotted lines across the rest of the page, providing space for writing answers.



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