Oxford Cambridge and RSA

Friday 23 May 2025 – Morning

A Level Physical Education

H555/01 Physiological factors affecting performance

Time allowed: 2 hours

You can use:
- a calculator

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | | | Candidate number | | | | |

First name(s) _____

Last name _____

INSTRUCTIONS
- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.

INFORMATION
- The total mark for this paper is **90**.
- The marks for each question are shown in brackets **[ ]**.
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **20** pages.

ADVICE
- Read each question carefully before you start your answer.

© OCR 2025 [601/8322/6]
DC (CJ/SW) 332311/2
OCR is an exempt Charity

Section A

1

(a) Which of the following are **both** muscles that contract to cause movement at the ankle?

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

A Gastrocnemius and adductor longus ☐

B Semitendinosus and soleus ☐

C Soleus and tibialis anterior ☐

D Teres minor and gastrocnemius ☐

[1]

(b) Which of the following are **both** muscles that contract to cause movement at the hip?

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

A Adductor brevis and iliopsoas ☐

B Gluteus minumus and latissimus dorsi ☐

C Trapezius and gluteus maximus ☐

D Vastus intermedius and pectoralis major ☐

[1]

2 The cardiac cycle involves systole and diastole.

Describe systole.

.....

.....

.....

..... **[2]**

3

(a) Explain the term excess post-exercise oxygen consumption (EPOC) in the recovery process.

.....

..... **[1]**

(b) State the effect of exercise intensity on EPOC.

.....

..... **[1]**

© OCR 2025

4 One example of a sports injury is torn cartilage, which may be treated using PRICE and will require further medical attention.

Identify **two other** appropriate treatments for torn cartilage.

1 .....

2 .....

[2]

5 The following statements describe Bernoulli's principle.

Complete the statements by using words from the box below:

air resistance	equal	flight
friction	higher	lower

According to Bernoulli's principle, faster moving fluids have ..... pressure which might create a lift force.

A downwards lift force causes an increase in ..... .

[2]

© OCR 2025

Section B

6

(a) Functional characteristics of muscle fibre types include the speed and force of contraction, aerobic and anaerobic capacity, and fatigue resistance.

Evaluate the functional characteristics of slow oxidative muscle fibres for a hockey player.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... **[5]**

© OCR 2025

(b) Explain how intrinsic factors regulate heart rate at the start of exercise.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... **[4]**

© OCR 2025

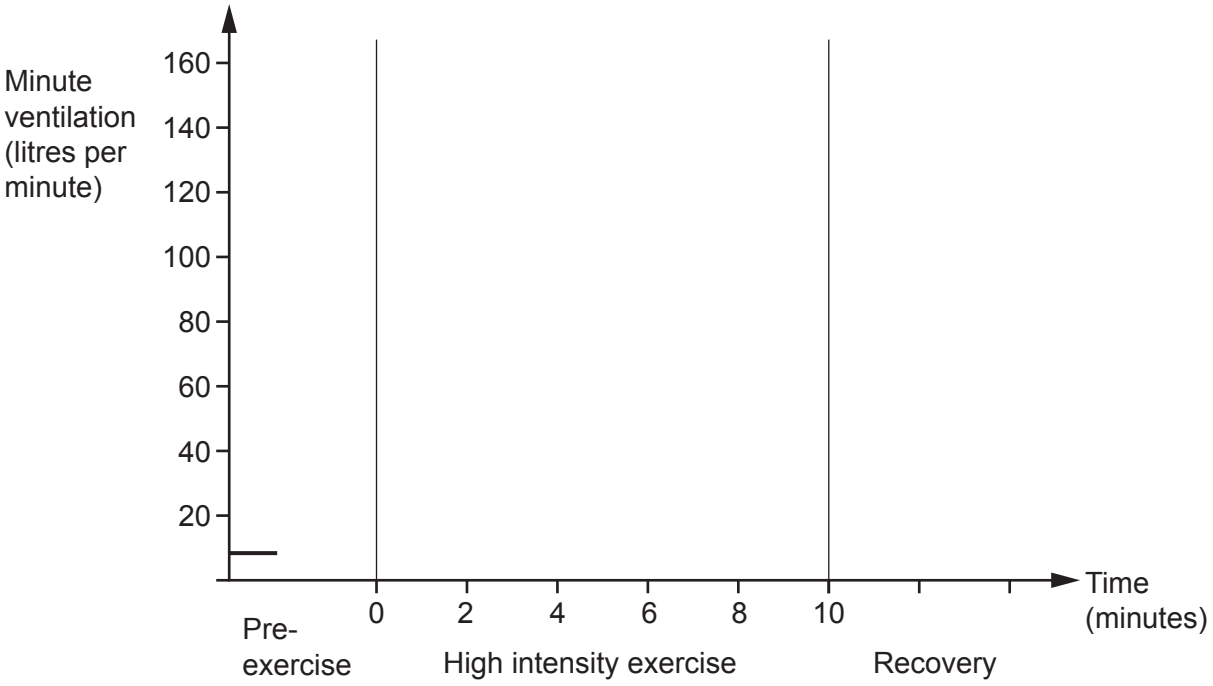
(c)

(i) Complete the **three** missing parts of the table to describe the respiratory system for a typical adult at rest.

Key term	Definition	Resting value
Frequency	The number of inspirations or expirations in one minute	
Tidal volume		

[3]

(ii) Sketch a line graph to show the effect of pre-exercise, high intensity exercise and recovery on the minute ventilation of a performer. The start of the line is on the graph to show minute ventilation at rest.



[3]

© OCR 2025

(d) Describe the short-term physiological effects of performing at high altitude on the cardiovascular system.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... **[5]**

© OCR 2025

7

(a) Explain **one** benefit and **one** risk of using each of the following nutritional aids:

Creatine

Benefit .....

.....

.....

Risk .....

.....

.....

Nitrate

Benefit .....

.....

.....

Risk .....

.....

.....

[4]

(b)

(i) Describe the use of the Queen's College step test as a method of evaluating aerobic capacity.

.....

.....

.....

.....

.....

.....

.....

..... **[4]**

© OCR 2025

(ii) Describe how a goniometer is used to measure knee flexibility.

.....

.....

.....

..... **[2]**

(c)
(i) Describe the lifestyle disease known as atherosclerosis.

.....

.....

.....

..... **[2]**

(ii) Outline **three** effects of regular training which might reduce the risk of atherosclerosis.

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

.....

[3]

© OCR 2025

(d) Discuss the role of an effective warm up and cool down in the prevention of sports injuries.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... **[5]**

© OCR 2025

8

(a) Describe the use of limb kinematics to optimise the performance of a javelin throw.

.....

.....

.....

.....

.....

.....

.....

..... **[3]**

(b)

(i) Define angular momentum.

State the formula used to calculate angular momentum.

Definition .....

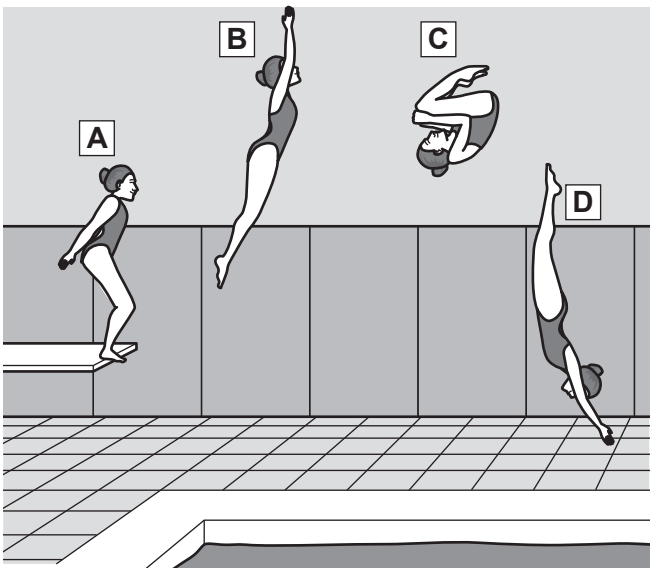
.....

Formula .....

[2]

© OCR 2025

(ii) The image shows the performance of a forward somersault dive.



Apply knowledge of conservation of angular momentum to explain how the diver performs this forward somersault dive.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... **[5]**

© OCR 2025

(c) State the force acting against the movement of a body through water.

Explain how **four** different factors affect the size of this force.

Force .....

Factors

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

.....

4 .....

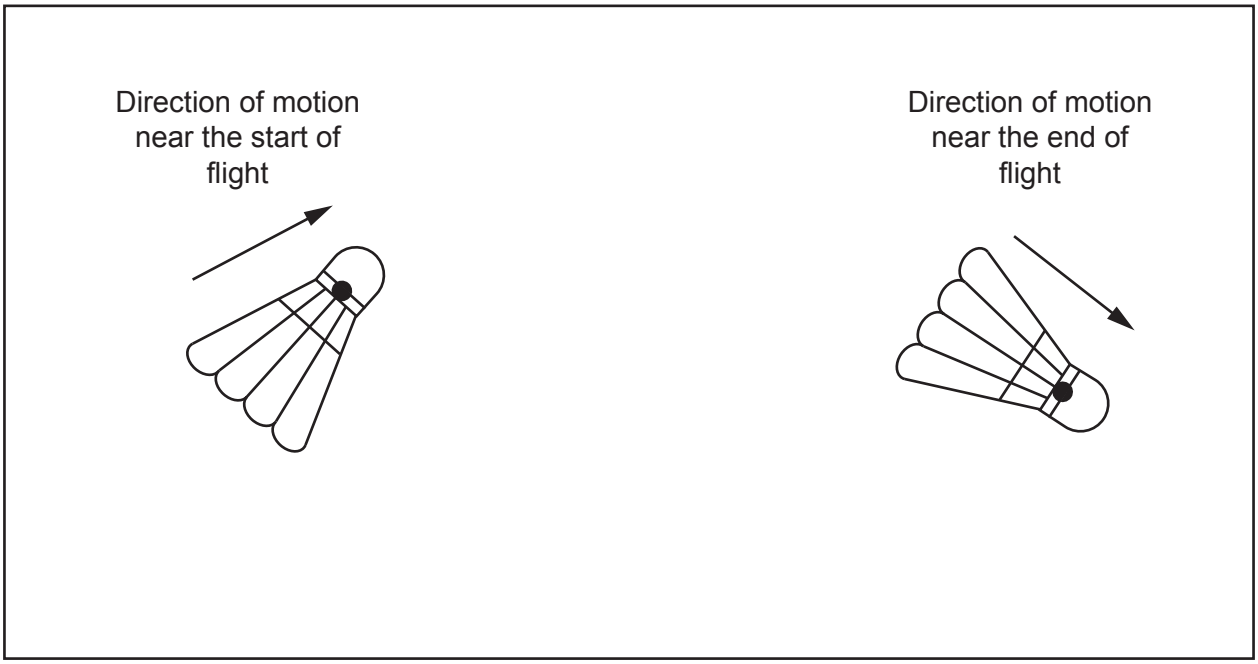
.....

.....

[5]

© OCR 2025

(d) The images show a hard-hit shuttlecock near the start and end of its flight.
The centre of mass of the shuttlecock is marked with a dot.



(i) On each image draw a free body diagram to show the relative sizes of the forces of weight and air resistance acting on the shuttlecock at each stage of its flight. **[2]**

(ii) Explain why the shape of the flight path of the shuttlecock is non-parabolic.

.....

.....

.....

.....

.....

.....

.....

.....

..... **[3]**

© OCR 2025

Section C

9* Define Newton's laws of motion and apply them to a sprinter in athletics.

Describe plyometrics strength training for a sprinter.

Analyse the physiological adaptations from plyometric strength training that would benefit a sprinter.

Your answer should be limited to:
- Muscle and connective tissue adaptations
- Neural adaptations
- Metabolic adaptations

[20]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

© OCR 2025

© OCR 2025

END OF QUESTION PAPER

© OCR 2025

EXTRA ANSWER SPACE

If you need extra space use these lined pages. You must write the question numbers clearly in the margin.

© OCR 2025

© OCR 2025

OCR
Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of Cambridge University Press & Assessment, which is itself a department of the University of Cambridge.

© OCR 2025