

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Friday 17 May 2019 – Morning

AS Level Physical Education

H155/01 Physiological factors affecting performance

**Time allowed: 1 hour 15 minutes
plus your additional time allowance**

**YOU MAY USE:
a scientific or graphical calculator**

Please write clearly in black ink.

Centre number

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Candidate number

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

First name(s) _____

Last name _____

READ INSTRUCTIONS OVERLEAF



INSTRUCTIONS

Use black ink. HB pencil may be used for graphs and diagrams only.

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.

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 (*).

BLANK PAGE

SECTION A

Answer ALL the questions.

- 1 (a) A football player will use their knee joint and the quadriceps group of muscles to perform a powerful clearance kick.

Identify ONE of the quadriceps muscles and the type of synovial joint at the knee.

Outline the functional role and type of contraction in the quadriceps muscle during the preparation and execution of the kick. [6]

(b) Table 1 shows the distribution of blood in the body at rest and during exercise.

Table 1

| Tissue/organ | At rest (ml/min) | Blood flow (%) | During exercise (ml/min) | Blood flow (%) |
|------------------------|-----------------------------|-------------------------------|---|-------------------------------|
| Skeletal muscle | 1000 | B | 16 000 | 80 |
| Heart | 250 | 5 | 750 | 3.75 |
| Brain | 750 | 15 | 750 | 3.75 |
| Skin | A | 10 | 1250 | 6.25 |
| Kidneys | 1000 | 20 | 750 | 3.75 |
| Other | 1500 | 30 | 500 | 2.50 |
| Total | 5000 | 100 | 20 000 | 100 |

(i) Calculate the missing values for A and B.

A = _____

B = _____

[2]

- (ii) Explain how the changes in the distribution of blood to the skeletal muscles and other organs is achieved during exercise.

Skeletal muscles _____

Other organs _____

[4]

[illegible]

(d) Compare the process of gas exchange at the muscles during exercise to resting conditions.

[4]

- 2 (a) Outline the timing and composition of pre-event meals an endurance athlete may use in the hours leading up to their event.**

[5]

(b) Aerobic capacity is an important fitness component for team game players.

Evaluate the benefit of different physiological adaptations made by the muscular and metabolic systems after a period of aerobic training.

[4]

(c) Describe, using a practical example for each, the following types of strength.

Static strength _____

Dynamic strength _____

Maximum strength _____

[6]

- (d) (i) Identify ONE recognised method of evaluating flexibility. Describe TWO advantages and ONE disadvantage of this method.**

Method: _____

Advantages: _____

Disadvantage: _____

[4]

- (ii) Explain why a javelin thrower would benefit from good shoulder flexibility.**

[1]

3 (a) Hockey players hit the ball at high speeds to prevent interceptions.

(i) Apply Newton's second law of motion to show how a hockey player may maximise the ball's acceleration.

[3]

(ii) Calculate the force applied to a hockey ball with a mass of 0.16 kg to cause it to accelerate at a rate of 30 ms^{-2} . Show your workings.

[2]

**(b) Identify all the component parts of a lever system.
Use a practical example from sport to show the
component order of a first class lever.**

[4]

(c) Explain, using practical examples, how force plates are used to enhance sporting performance.

[5]

SECTION B

- 4* Explain the physiological adaptations as a result of a flexibility training programme, applying them to a sporting activity of your choice.**

Evaluate, using practical examples, the structural and functional characteristics of fast oxidative glycolytic muscle fibres. [10]

[illegible]

[illegible]

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).

| | |
|--|--|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |



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 the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.