OCR
Oxford Cambridge and RSA

Monday 19 May 2025 – Afternoon

GCSE (9–1) Physical Education

J587/01 Physical factors affecting performance

Time allowed: 1 hour

No extra materials are needed.

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

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

First name(s) _____

Last name _____

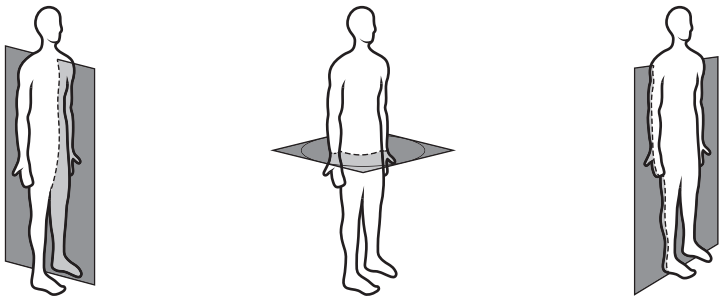
INSTRUCTIONS
- Use black ink.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.

INFORMATION
- The total mark for this paper is **60**.
- 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 **16** pages.

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

Section A

1 The images show the three planes of movement.



A **B** **C**

(a) Name the correct plane of movement for **A**, **B** and **C**.

A .....

B .....

C .....

[3]

(b) State if movement is through plane **A**, **B** or **C** for each of the following sporting examples:

A gymnast performing a cartwheel .....

The running action of a sprinter's legs .....

[2]

2 Define the term **circumduction**.

Give a practical example of this movement.

Definition .....

.....

Practical example .....

.....

[2]

3 Name the acid produced in the working muscles during anaerobic exercise.

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

4 What type of circulatory system is the heart at the centre of?

Tick (✓) **one** box next to the correct answer.

double-circulatory system	☐
quadruple-circulatory system	☐
single-circulatory system	☐
triple-circulatory system	☐

[1]

5 Use a practical example from swimming to show the importance of a fast reaction time.

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

6 Litter, lack of supervision and overcrowding are examples of hazards in a fitness centre.

Identify **one** other hazard in a fitness centre.
Explain how this hazard can cause injury during a sporting activity.

Example of hazard:

.....

.....

How this hazard can cause injury:

.....

.....
[2]

7 State the role of red blood cells.

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

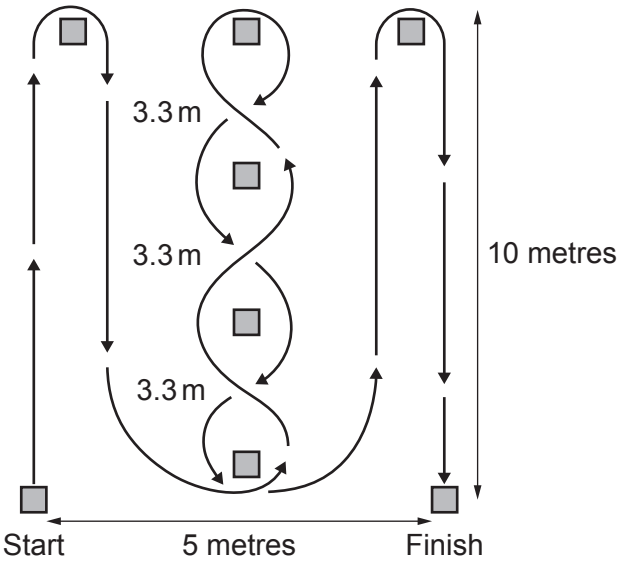
8 Complete the **two** statements using words from the list below.

clavicle	gastrocnemius	quadriceps
scapula	sternum	ulna

(a) Articulating bones at the shoulder joint are the humerus and ..... **[1]**

(b) Muscles found at the back of the leg are the hamstrings and ..... **[1]**

9 The image shows the set-up and route for a test of one component of fitness.



Name the component of fitness that is measured by this test.

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

10 Identify **two** physical benefits of a warm up.

1 .....

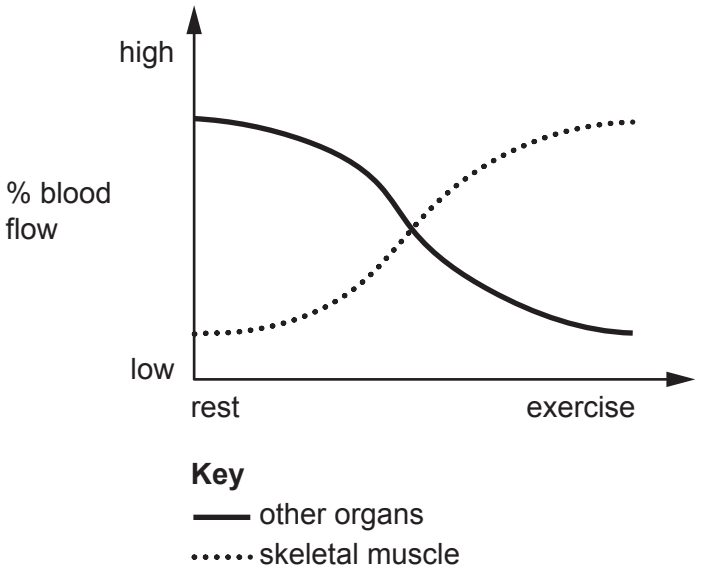
.....

2 .....

.....

[2]

11 The graph shows the percentage of blood flow to skeletal muscle and other organs at rest and during exercise.



Explain why the percentage of blood flow **decreases** to other organs during exercise.

.....

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

12 During exercise, a swimmer has a cardiac output of 7000 ml / min and an average stroke volume of 70 ml.

Which **one** of the following is the swimmer's heart rate during exercise?

Tick (✓) one box next to the correct answer.

50 bpm ☐

75 bpm ☐

100 bpm ☐

125 bpm ☐

[1]

13 Describe the role of the **tricuspid** valve.

.....

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

14 Name the heart chamber that **receives** blood from the vena cava.

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

15

(a) Define the term **tidal volume**.

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

(b) State what happens to the tidal volume of a 100 m swimmer during a race.

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

16 Describe how a weight trainer could increase intensity in their weight training programme.

.....

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

17 FITT is an acronym for optimising training.

State the meaning of **one** of the letter 'T's in the FITT principle.

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

18 Describe the effect of a cool down on **breathing rate**.

.....

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

19 Describe how an **amateur boxer** can reduce the risk of injury by giving a practical example for each of the following:

Personal protective equipment

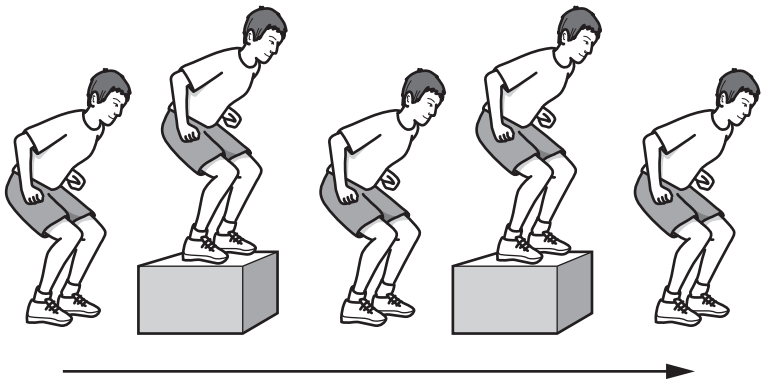
.....

Appropriate level of competition

.....

[2]

20 This image shows a training exercise which involves jumping.



Name the type of training shown.

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

Section B

21 The image shows a gymnast performing a pike as part of a trampoline routine.

(a) Name the type of movement for the gymnast in the image.

At the hip joint: .....

At the knee joint: .....

[2]

(b) Explain how the muscles at the knee joint work as an antagonistic pair to produce the movement of the knees shown in the image.

.....

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.....

.....

.....

.....

.....

.....

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

(c) Describe the following functions of the skeleton.

You must apply each function to a gymnastic routine.

Protection:

.....

.....

Posture:

.....

.....

Support:

.....

.....

[3]

(d) Tendons are a connective tissue found at the knee.

State the main role of tendons.

.....

Name **one** other type of connective tissue found in the knee.

.....

[2]

22

(a) A cyclist is unable to train due to injury.

(i) Describe **two** effects of reversibility on the cyclist's **muscular** system.

1 .....

.....

2 .....

.....

[2]

(ii) Describe **two** ways that reversibility will affect the cyclist's performance in a **cycle race**.

1 .....

.....

2 .....

.....

[2]

Turn over for the next question

(b) A cyclist recovers from injury and completes a 12-week fitness programme.

The table shows resting heart rate, stroke volume and cardiac output before and after the 12-week fitness training programme.

	Before fitness training programme	After fitness training programme
Resting heart rate	72 beats per minute	67 beats per minute
Resting stroke volume	69.5 millilitres	82.1 millilitres
Resting cardiac output	5 litres per minute	5.5 litres per minute

(i) Calculate the difference shown in resting stroke volume.

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

(ii) Calculate the percentage increase in cardiac output as a result of the fitness training programme.

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

(c) Describe **two** long-term effects of a 12-week fitness training programme on the respiratory system.

1 .....

.....

2 .....

.....

[2]

(d) Give a practical example from a cycle race of the following:

Aerobic exercise

.....

Anaerobic exercise

.....

[2]

23

(a) Low-intensity exercise and stretching are the components of a cool down.

Describe an example of each cool down component.

Low-intensity exercise:

.....

Stretching:

.....

[2]

(b) The physical benefits of a cool down include gradually lowering heart rate, breathing rate and body temperature.

Describe **two** other physical benefits of a cool down.

1 .....

.....

2 .....

.....

[2]

(c)* A warm up prepares the body for exercise and can help to increase skill levels in sport.

Describe the components of a warm up.

Describe and apply the characteristics of skilful movement.
Apply your answer to a named physical activity or sport. **[6]**

Named physical activity or sport .....

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END OF QUESTION PAPER

EXTRA ANSWER SPACE

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