

Examiners' report

GCSE

PHYSICAL EDUCATION

**OCR Level 1/Level 2 GCSE (9-1) in
Physical Education**

J587

For first teaching in 2016

J587/01 Summer 2025 series

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Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. A selection of candidate responses is also provided. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

Where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.

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Paper 1 series overview

J587/01 is one of two examined components for GCSE (9-1) in Physical Education. This component links together the topic areas of applied anatomy and physiology and physical training. To do well on this paper, candidates need to apply knowledge and understanding using practical examples from sports and practical activities, and to show an understanding of data analysis.

J587/01 includes one extended response question that forms part of synoptic assessment, in which the candidates are required to apply knowledge and understanding from J587/02 to this extended question.

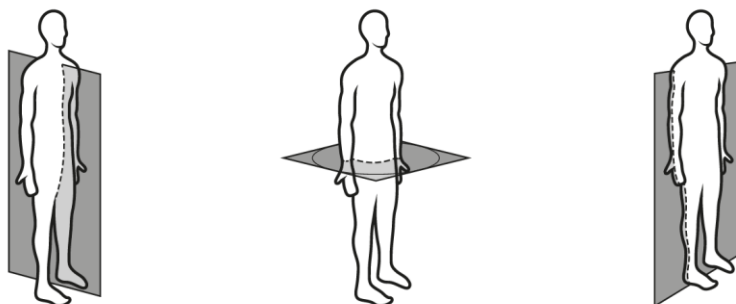
Candidates who did well on this paper generally:	Candidates who did less well on this paper generally:
• paid attention to all the key words in the question • used well-developed lines of reasoning for explanations and extended responses • provided clear practical examples which supported theoretical knowledge when asked to do so.	• misunderstood questions through not studying the key words carefully • tended to repeat information provided in the question • gave irrelevant answers, for example, changes to other body system • did not plan their extended response.

Section A overview

Section A consists of 20 questions ranging in size/mark allocation and making 30 marks in total, taken from across the 2 topics (Anatomy and Physiology; Physical Training). Question formats include multiple choice; true/false; short responses.

Question 1 (a) and 1(b)

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]

Both Question 1 (a) and 1 (b) were generally well answered. The images should have helped candidates to determine the plane of movement for each example in Question 1 (b). Some candidates incorrectly gave the names of axes of rotation as answers for Question 1 (a). A few candidates named the plane of movement for each example in Question 1 (b). This was not asked for. However, correct answers were credited.

Question 2

2 Define the term **circumduction**.

Give a practical example of this movement.

Definition

.....

Practical example

.....

[2]

More successful responses gave a correct definition for circumduction and a correct practical example. The most common examples highlighted the movement of the arm when bowling in cricket or the arms when swimming using butterfly or front crawl strokes. Answers that did not state which joint or limb performs circumduction during the named example were not credited

Assessment for learning



Many candidates named an example of a sport skill but did not specify which joint or limb performs circumduction in the skill. These answers could not be credited because many joints are involved in the different phases of the skill and many different joint movements are happening.

Candidates are encouraged to analyse a range of movements in sports and during physical exercises as preparation for the exam. The movements must be linked to named joints.

Question 5

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

..... [1]

The strongest candidates understood that their answer had to show why a fast reaction time is important for a swimmer. These candidates identified that a fast reaction time gave the performer an advantage over the other swimmers. Many answers did not address the question and simply stated when reaction time is needed in swimming.

Question 6

- 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]

This question was very well answered. Candidates identified a range of hazards that could be present in a fitness centre and explained how the named hazard could cause injury. Less successful responses stated a hazard and said that it could cause an injury, but did not explain how an injury could be caused.

Question 7

- 7 State the role of red blood cells.

..... [1]

Most candidates answered this question correctly. Some answers described the role of red blood cells as carriers of oxygenated blood. This is not correct. Arteries in the systemic circuit carry oxygenated blood.

Question 10

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

- 1
- 2

[2]

Misconception



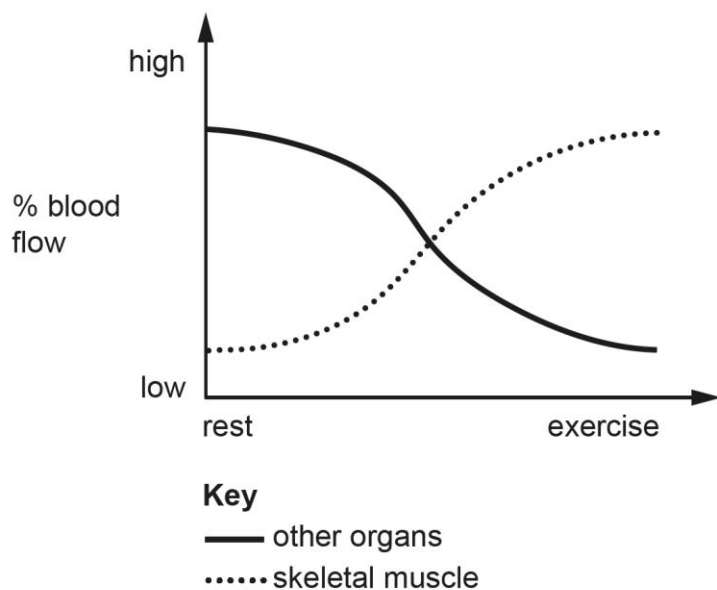
There are some common misconceptions around the benefits of a warm up.

Some candidates believe that a warm up can prevent injuries. This is not possible as injuries may still occur during a sporting activity. A warm up only reduces the risk of joint and muscle injuries

Some candidates believe that a warm up means blood flows to the muscles. Candidates are reminded that all the muscles receive blood all the time. A warm up increases blood flow to muscles.

Question 11

- 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]

The stronger candidates gave a correct explanation. Some answers explained the vascular shunt mechanism. Less successful responses tended to describe what the graph shows, i.e. more blood goes to the skeletal muscles. This does not explain why less blood flows to other organs during exercise.

Key point call out (redistribution of blood flow during exercise)

Candidates should be aware that non-essential organs need a certain amount of blood to function effectively. It is not true to say that they need less oxygen during exercise. They can cope with less oxygen for the duration of exercise. But this does not explain why blood flow to these organs decreases. Answers describing vasodilation and vasoconstriction must include reference to the blood vessels which are widening or narrowing to gain credit.

Question 13

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

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

Successful candidates described the role of the tricuspid valve accurately. Less successful responses tended to describe the role of valves in general. These answers were not specific enough to gain any credit.

Key point call out (valves of the heart)

The syllabus identifies that students must understand the pathway of blood through the heart and the bicuspid and tricuspid valves are named separately. Students should understand that the bicuspid valve is found between the left atrium and ventricle, whereas the tricuspid valve is on the right side of the heart, between the right atrium and ventricle.

Question 15 (a) and (b)

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]

More successful responses produced correct definitions for tidal volume. Many answers confused tidal volume with stroke volume. Some responses incorrectly described the movement of oxygen, rather than air in the lungs. Others incorrectly stated that it was the volume of air inhaled and exhaled per breath. A few answers defined minute ventilation instead of tidal volume.

Most answers for Question 15 (b) were correct. Candidates who were unable to define tidal volume were still able to gain credit for a correct answer for Question 15 (b).

Question 18

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

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

More successful responses correctly stated that a cool down gradually reduces breathing rate. Less successful responses tended to describe what happens to breathing rate after exercise regardless of a cool down.

Question 19

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]

Many candidates answered this question well with a gum shield or head guard or boxing gloves the most common named personal protective equipment. A helmet was not credited because helmets are made of rigid material which is not appropriate for boxing. Age, gender and weight categories or similar levels of experience or skill level were all given as suitable ways to reduce the risk of injury under the heading of appropriate level of competition.

Misconception



Some candidates showed a misconception that amateurs should not fight against professionals. These answers seemed to suggest that the amateur would get hurt. However, this ignores the fact that some of the best boxers in the world are amateurs. Moreover, it does not consider that weight or skill level are used to reduce the risk of injury in boxing.

Candidates are reminded that the term 'amateur' should not be associated with a lower standard of performance.

Section B overview

Section B consists of 3 x 10-mark questions each comprising of part-questions. Each question is linked to anatomy and physiology or physical training. One part-question within the three questions is a 6-mark extended response question with a levels of response mark scheme.

Question 21 (a) and (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.

.....

.....

.....

.....

.....

.....

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

Most candidates identified that knee extension is taking place in the image. More successful responses also identified hip flexion.

The best responses for Question 21 (b) were concise and accurate. These answers named the antagonistic pair of muscles and stated which was the agonist and which was the antagonist. Sometimes these answers also identified that the agonist contracts and the antagonist relaxes. Some candidates showed extra knowledge to explain knee flexion. This was not required and was not credited. A few candidates gave contradictory responses in which some correct comments could not be given.

Exemplar 1

The quadriceps (agonists) relax, while the hamstrings (antagonists) contract, creating the movement in the knee. When the gymnast moves back, the quadriceps contract (now antagonists) and the hamstrings relax (now agonists).

Exemplar 1 loses marks for giving contradictory answers. It states that the quadriceps are the agonist muscle (which is correct) but that this muscle relaxes (which is incorrect and contradictory because agonists do not relax). Similarly, the explanation of the role of the hamstring muscles is contradictory as antagonists do not contract during movement.

One mark is given for correctly naming the antagonistic pair of muscles.

Question 21 (c)

(c) Describe the following functions of the skeleton.

You must apply each function to a gymnastic routine.

Protection:

.....

.....

Posture:

.....

.....

Support:

.....

.....

[3]

This question asks candidates to describe each of the functions of the skeleton and each answer must be applied to a gymnastic routine. Most candidates described protection, and this was often applied to falling off a piece of apparatus during a routine. More successful responses also correctly described posture and applied it to a routine. Only the strongest candidates were able to describe support as a function of the skeleton.

Exemplar 2

Protection:

~~Protection~~ Protection involves flat bones protecting vital organs, for example your cranium protecting your brain during a floor routine if you fall on your head.

Posture:

Posture involves maintaining an ^{upright shape} ~~shape~~, for example maintaining an upright position with your back (vertebrae) ~~the~~ before going into a handstand.

Support:

Support involves the ability to keep and hold ^{any} ~~a~~ shape and hold ^{your body} for example a ^{cartwheel} ~~handstand~~ requires an upright shape.

[3]

Exemplar 2 correctly describes protection as a function, using the example of the cranium protecting the brain. This is applied to gymnastics by referring to falling on your head during a floor routine. Posture as a function of the skeleton is also correctly described with application to a handstand.

The description of support is too vague to be credited. The answer could be improved by describing the skeleton as a framework to which muscles are attached so that when a cartwheel is performed the muscles contract to hold the shape of the gymnast and move the limbs in the desired way.

Question 22 (a) (i)

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]

Most candidates correctly described two effects of reversibility on the muscular system. Some answers gave two correct responses within the first answer line because they gave an explanation. For example, muscle atrophy which means they lose strength. These answers were given two marks. However, it is important for candidates to understand that only the first two answers will be credited. So, if the answer on the first line is incorrect, two marks cannot be given for the answer in the second answer lines. This is because only two answers are asked for. Candidates are reminded that in this type of questions only the set number of responses will be marked.

Question 22 (a) (ii)

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

1

.....

2

.....

[2]

Many candidates recognised that effects of reversibility on a cyclist's performance in a race were required. The answers from these candidates were applied to this situation. Less successful responses often described effects of fatigue but did not show an effect on performance. Application of knowledge to a specific scenario needs to be clear and unambiguous to gain credit.

Exemplar 3

- 1 They will experience fatigue quicker meaning they can't cycle as fast.
- 2 They won't be able to exert as much force on the pedals so they will cycle slower.

This response applies knowledge of reversibility to a cyclist's performance. The first answer says that the cyclist will not be able to cycle as fast, which applies knowledge that speed of muscle contraction will be lost. The second answer applies knowledge that muscle strength in the legs will be lost as the cyclist will not be able to exert as much force on the pedals.

Questions 22 (b) (i) and (ii)

(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]

Data analysis is a requirement on each question paper. Most candidates were able to calculate the difference in resting stroke volume. However, less successful candidates struggled to calculate the percentage increase in cardiac output.

Question 22 (c)

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

- 1
-
- 2
-
- [2]

More successful responses answered this question well. Less successful responses sometimes described long-term effects on other systems. This highlights the need to read every question carefully.

Key point call out (long-term effects of training on the respiratory system)

The long-term training effects of regular training on the respiratory system are not comparable to some of the effects on the cardiovascular system. Increases in tidal volume and minute ventilation are seen during exercise and these are credited. However, a greater efficiency in gaseous exchange at the alveoli means that tidal volume at rest and minute ventilation at rest are both reduced.

Question 22 (d)

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

Aerobic exercise

.....

Anaerobic exercise

.....

[2]

More successful responses gave a practical example from a cycle race for both aerobic and anaerobic exercise. There were more correct answers for an example of anaerobic exercise than for aerobic exercise. Candidates generally described a sprint finish which implies high intensity anaerobic exercise. However, cycling uphill or downhill can be aerobic or anaerobic depending on the effort being put in by the cyclist. Therefore, these answers were not credited.

Candidates are reminded that examples must clearly show low or moderate intensity work to be considered as aerobic exercise.

Question 23 (a)

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]

This was generally a well answered question. Most candidates described suitable examples for each cool down component. Other candidates misunderstood the question and described a benefit of each component.

Question 23 (b)

- (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]

Candidates who studied the wording of the stem of the question recognised the use of the word 'gradually' to the changes listed. These candidates answered the question well. Less successful candidates did not describe the physical benefits to show how a cool down helps after exercise.

Assessment for learning



Candidates are reminded that a cool down has an important role during the recovery process after exercise in helping speed up all aspects of recovery.

Answers that describe processes that will occur naturally without a cool down, such as the removal of lactic acid are not describing a benefit of a cool down.

Candidates should learn to use key words such as 'speeds up' or 'gradually reduces' to highlight a benefit of a cool down.

Candidates should also be aware that a cool down happens after exercise has taken place, so a cool down cannot help to reduce the risk of injuries. It can only help to reduce muscle soreness.

Question 23 (c)*

(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

The best responses showed detailed knowledge and understanding of warm up components and applied their knowledge of the characteristics of skilful performance to practical examples from a sport of their choice. These answers were presented with a clear and logical structure, giving a description followed by an example for each component or characteristic.

Less successful responses lacked structure and tended to give either practical examples of warm up components or the reasons for doing a warm up.

Other candidates often named some characteristics of skilful performance but were unable to describe their meaning. These answers tended to state examples of sport skills without showing what makes them skilful.

Some candidates did not address the second part of the question.

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