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OCR
Oxford Cambridge and RSA

GCSE (9-1)

Examiners' report

PHYSICAL EDUCATION

J587
For first teaching in 2016

J587/01 Summer 2018 series

Version 1

Contents

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. 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. A full copy of the question paper can be downloaded from OCR.

Paper J587/01 series overview

J587/01 is one of two examined components for the new revised 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.

Candidate performance overview

Candidates who did well on this paper generally did the following:

- produced clear and concise responses
- planned how to construct the extended response, using practical examples for a sprinter to support each knowledge point, together with evaluations of the benefits of mental preparation techniques for a sprinter: Q22b
- applied knowledge and understanding using examples from a practical activity, when this was a requirement of the question: Q5, Q9, Q18
- matched the amount of knowledge to the number of marks in the question: Q22b(ii), Q23a.

Candidates who did less well on this paper generally did the following:

- produced responses that lacked depth, or repeated the same point in a variety of ways: Q12, Q21a, Q22b(ii)
- used irrelevant sporting examples in the extended response question, which was specific to a 100 metre sprinter: Q22b
- found difficulty in differentiating between risks and hazards in sporting situations.

Most successful questions	*Least successful questions*
• Distances for multi-stage fitness test and speed test Q6. • An example of a sport needing aerobic endurance Q10. • Knowledge of circuit training Q11a and b. • Description of a cool down for a dancer Q17. • True/false statement on the circulatory system Q20.	• Articulating bones in the shoulder joint Q4. • Potential hazards in a swimming pool Q8. • Multiple choice question asking which statement is false Q15. • Application of appropriate level of competition to a sport or physical activity Q18. • Role of respiratory muscles Q23b.

Section A overview

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

Question 1

1 Describe the function of alveoli.

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

Most candidates correctly stated that the function of alveoli is gaseous exchange. Diffusion was an acceptable alternative for this. Higher ability candidates went on to explain that oxygen diffused into the blood capillaries, and that carbon dioxide diffused from the capillaries into the alveoli.

Question 2

2 **Fig. 1** below shows a diagram of the heart.

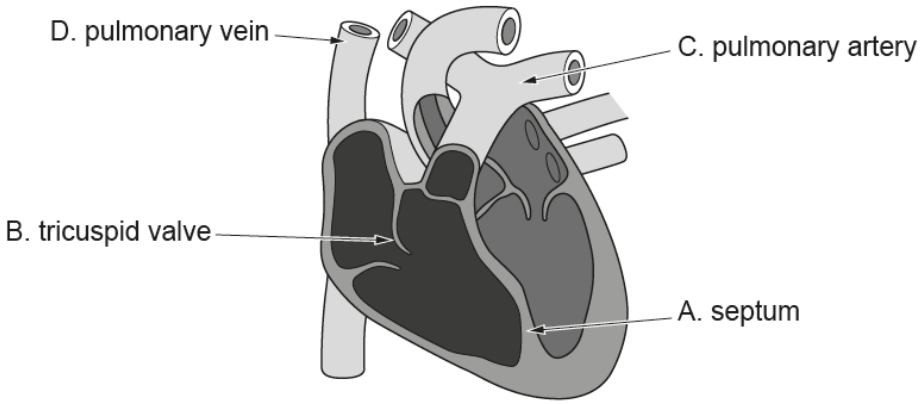

Fig. 1

Identify the part of the heart that is labelled incorrectly in **Fig. 1**.

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

Acceptable responses for this question gave the letter D, or stated that the pulmonary vein was the part that was incorrectly labelled. Some candidates correctly pointed out that the vena cava was labelled incorrectly, and, although this was not required, gained credit for this response.

Question 3

3 Give a definition of a synovial joint.

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

Many candidates correctly stated that a synovial joint is a freely-movable joint or is a joint that allows a range of movement. Some candidates stated that it is where two or more bones meet. However, this is a definition of all joints, rather than a synovial joint in particular, so was too vague. Descriptions of the role of synovial fluid needed to be linked to a synovial joint and that the fluid enables free movement to take place to gain credit.

Question 4

4 A rugby player will use their shoulder joint when making a tackle.

Name the **two** articulating bones in the shoulder joint that are at risk of injury during a rugby tackle.

1. .....

2. .....

[2]

Many candidates incorrectly named the clavicle, but this bone does not form part of the shoulder joint. Candidates are advised to learn the names of the articulating bones at the joints which are listed in the specification.

Question 5

5 Reversibility is a principle of training.

Using a practical example, explain what is meant by the term 'reversibility'.

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

This question requires an explanation of reversibility as a principle of training, and asks for this to be applied to a practical example. Marks were credited for saying that the benefits of training, either skills or fitness components, would be lost if a performer stopped training for a period of time. A practical example had to be used to gain both marks. A common error was to use the word 'reverse' in the answer. For example, "strength would be reversed if a weight lifter stopped training due to injury".

Exemplar 1

Reversibility is when a muscle is not used for a long period, that it starts to have the opposite effects on and decreases. This could be due to an injury where the injured areas muscles can not be used. **[2]**

This response states that there is a negative impact if a muscle is not used for a long period of time, perhaps due to an injury. One mark is credited for this statement.

The response could have been improved by using a practical example to describe the negative impact on the muscle. For example, a tennis player would lose the strength in their shoulder that they had gained from training as a result of this.

Question 7 (i)

7 **Fig. 2** shows a diagram of the lower leg.

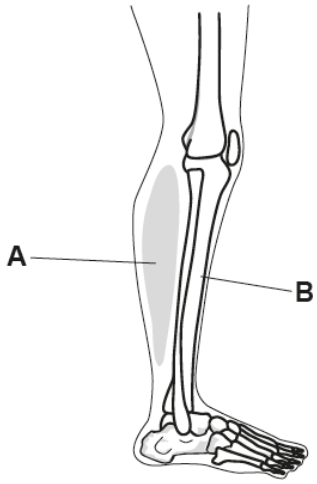

Fig. 2

Identify muscle **A** and bone **B**.

(i) Muscle **A**: ..... **[1]**

Question 7 (ii)

(ii) Bone **B**: ..... **[1]**

This question required the correct names as listed in the specification. Some candidates incorrectly named A as the calf, and B as the shin. Other common errors included using the terms 'fibia' or 'tibula' for bone B.

Question 8

8 Identify **two** potential hazards in a swimming pool.

1. .....

2. .....

[2]

Many candidates correctly identified a slippery wet surface, the depth of the water in the pool, water quality, too much chlorine or the actions of other swimmers as potential hazards. Some candidates incorrectly identified risks, such as drowning, rather than hazards. A hazard is the cause of an issue whereas a risk is the potential consequence. Responses which stated a risk but also made reference to a hazard did gain credit. For example "slipping and banging your head on the hard floor because the floor was wet".

Question 9

9 Using practical examples, explain the difference between the transverse and longitudinal axes of rotation.

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

This question required candidates to describe the positions of the transverse and longitudinal axes, and give a practical example to show an understanding of a movement around each axis. Most candidates correctly named a somersault as a movement around the transverse axis and a pirouette as a movement around the longitudinal axis. Many responses also correctly stated that the transverse axis passes through the hips and the longitudinal axis runs from head to toe. Some candidates described the transverse axis as one that passes through the centre of the body. However, all three axes of rotation do this, and therefore this statement does not explain a difference between the two axes. Responses which included a diagram to show the positions of the axes were credited if it was clear where the axes lay in relation to the body and the axes were clearly labelled.

Exemplar 2

The transverse axis of rotation allows for forward and backward movements, for example a somersault in gymnastics. This differs from the longitudinal axis, which allows for rotational movement such as a pirouette in ballet

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

This response correctly identifies a sporting movement that occurs around each axis. Two marks are credited for these practical examples.

The response could have been improved by describing the positions of both axes in relation to the body. For example, the transverse axis runs from one side of the body to the other, and the longitudinal axis runs from top to bottom.

Question 11 (a)

11 (a) Circuit training is a training method that consists of a series of exercise stations.

Describe **one** other feature of circuit training.

.....

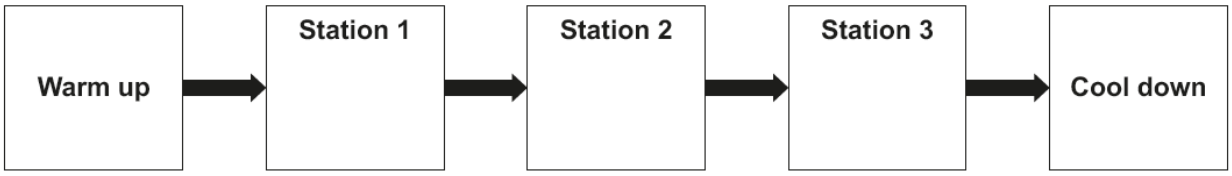
..... **[1]**

Most candidates correctly stated that circuit training targets different muscle groups, had rest periods between stations, or that work at each station was for a set time.

Question 11 (b)

(b) Design a simple circuit training session to overload the upper body by completing the diagram below, placing one of the named exercises in each station.

Bicep curls	Lunges	Squats	Press ups	Pull ups	Step ups



[1]

The vast majority of candidates correctly placed at least two upper body exercises in the circuit. A few candidates placed three lower body exercises in the circuit, and this may have been caused by not reading the question carefully enough. Many candidates underline the key words in each question to avoid any such misunderstandings and to focus their answers on the requirements of the questions.

Question 12

12 Cartilage plays an important role in the skeletal system.

Assess how cartilage helps a marathon runner during performance.

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

Most candidates correctly stated that cartilage reduces friction between the bones of the leg, and acts as a shock absorber to cushion the knee joints whilst running. Some candidates made one of these points and then repeated the same point using different examples from running, and as a result only gained one mark.

Question 15

15 Which one of the following statements is false?

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

A Fixators help stabilise a joint and prevent unnecessary movement ☐

B Most lever systems in the body are 3rd class ☐

C A common hazard in rugby is concussion ☐

D Fartlek training improves speed and endurance ☐

[1]

Similarly to question 8, a number of candidates were unable to differentiate between a risk and a hazard. Some candidates used a process of elimination to come to their answer, by identifying the statements they thought were correct.

Question 17

17 Describe a suitable cool down for a dancer.

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

Most candidates were able to describe suitable pulse lowering and stretching exercises for a dancer's cool down. Some responses only described one exercise, either stretching or low intensity movement. Candidates are advised to check the number of marks available to each question to understand how many points should be made.

Question 18

18 Give a practical example of how an appropriate level of competition can prevent injury to a performer in a sport or physical activity.

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

This question required candidates to show an understanding of the ways that sports may structure competition so that the risk of injury is minimised. The most common responses referred to age, weight and ability categories and applied them accurately to a named sport. Some candidates made generalised comments about how injuries may be caused by having different skill levels in a sport, and a more specific description of how injuries are prevented in that sport was required.

Question 19

19 **Fig. 5** shows a picture of the foot of a long jumper taking off.

Label Arrows A and B to correctly identify the components of this lever system.

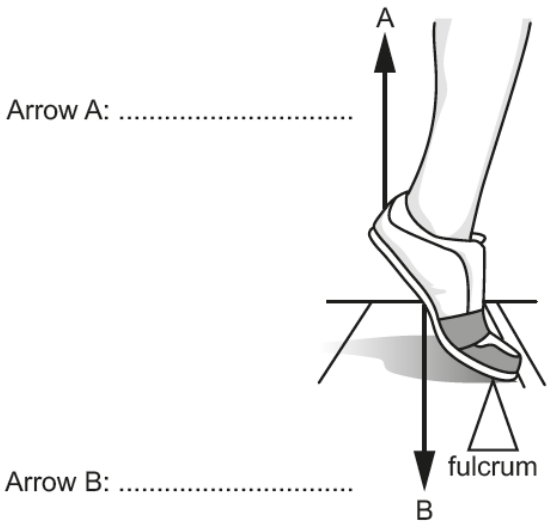

Fig. 5

[1]

Most candidates correctly identified A as effort and B as load. Some candidates understood the correct terms, but put them in the wrong places. Candidates are reminded that the correct technical terms must be used to describe a lever system.

Section B overview

Section B consists of three 10 mark questions each comprising part-questions. Each question is linked to a physical activity. One part-question from amongst the three questions is a 6 mark extended response question with a levels of response mark scheme.

Question 21(a)

21 (a) Explain the short term effects on the heart and the blood of a swimmer performing a 100 m front crawl.

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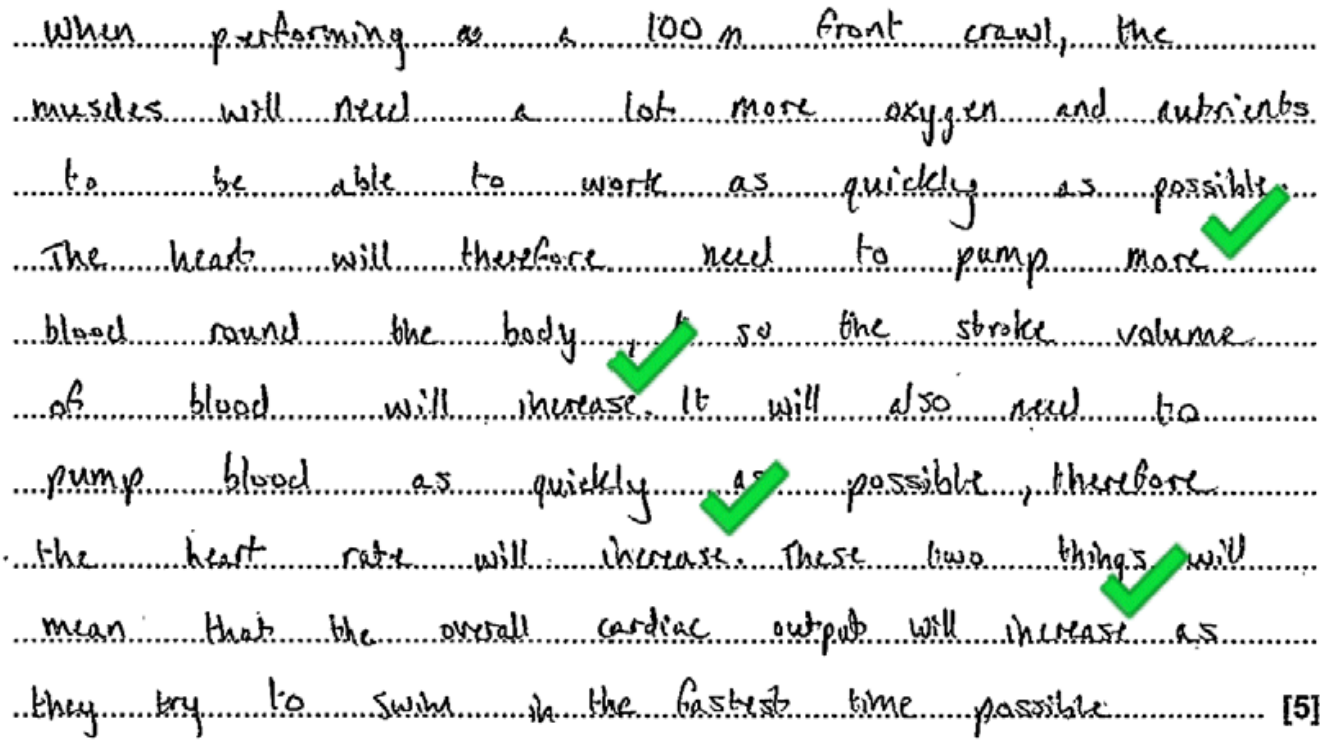
..... **[5]**

Many candidates correctly stated that heart rate, stroke volume and cardiac output all increase. Higher ability candidates explained these changes and others, such as why blood pressure and blood temperature increase, and some candidates described the vascular shunt mechanism.

Exemplar 3



This response gained four marks for explaining that more blood is pumped round the body because the muscles need more oxygen, and that this happens by increasing heart rate and stroke volume, which causes an increase in cardiac output.

The response could be improved by explaining that the blood will have more lactic acid because the muscles are working hard. Alternatively, an explanation of the redistribution of blood, sending less blood to non-essential organs, could have been given.

Question 21(b) (i)

(b) A swimmer who undergoes a six month training programme will experience muscular hypertrophy.

(i) What is meant by the term 'muscular hypertrophy'?

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

Most candidates identified that muscular hypertrophy meant an increase in size of muscle. Other acceptable answers included growth of muscle and increase in mass.

Question 21(b) (ii)

(ii) Describe other muscular benefits the six month training programme might have for the swimmer.

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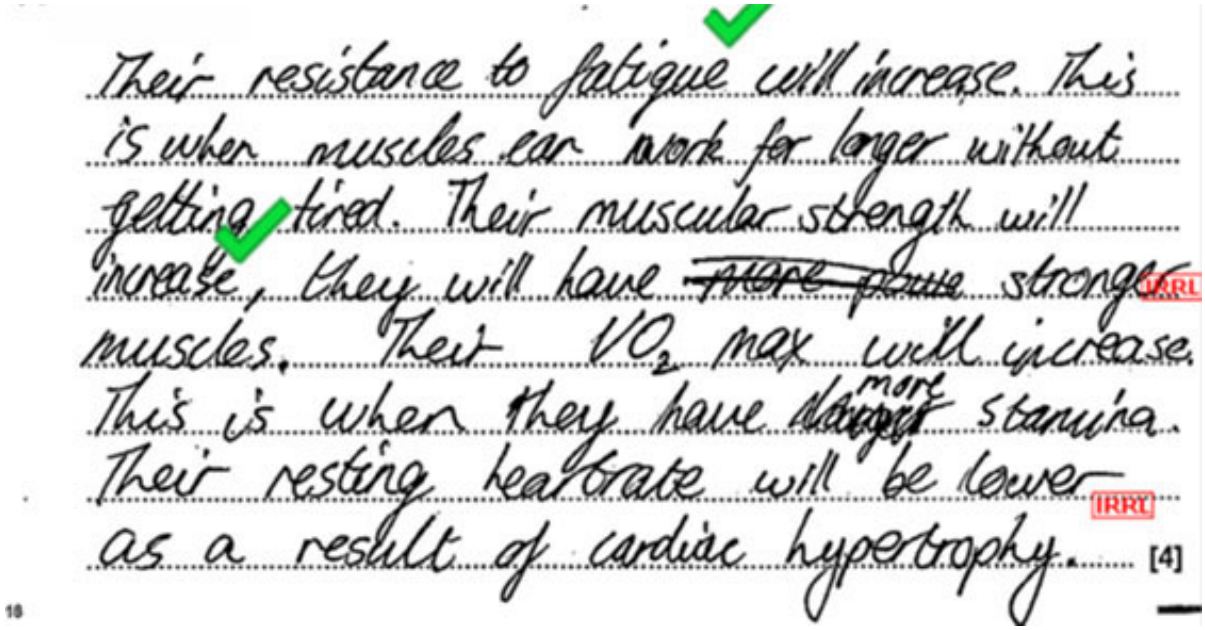
..... **[4]**

The majority of responses described at least one muscular benefit, usually an increase in muscular endurance, and many candidates also identified an increase in strength.

Some candidates had defined muscular hypertrophy in the previous question as an increase in strength, and this may be why they did not give increased strength as a benefit in this question.

Exemplar 4


Their resistance to fatigue will increase. This is when muscles can work for longer without getting tired. Their muscular strength will increase, they will have ~~more power~~ stronger IRRL muscles. Their VO_2 max will increase. This is when they have more stamina. Their resting heartrate will be lower IRRL as a result of cardiac hypertrophy. [4]

18

This response scored two marks for stating that resistance to fatigue will increase and so will strength. The comments that VO_2 max and stamina will increase, and that resting heart rate will be lower are not muscular benefits, so do not gain credit.

This response could be improved by describing increases in the speed and flexibility of muscles, or by explaining that muscles will have a greater tolerance to lactic acid and a faster recovery rate.

Question 22(a)

22 (a) Reaction time and speed are important fitness components required for a 100 m sprinter.

Define the fitness components of reaction time and speed and explain their importance to a 100 m sprinter.

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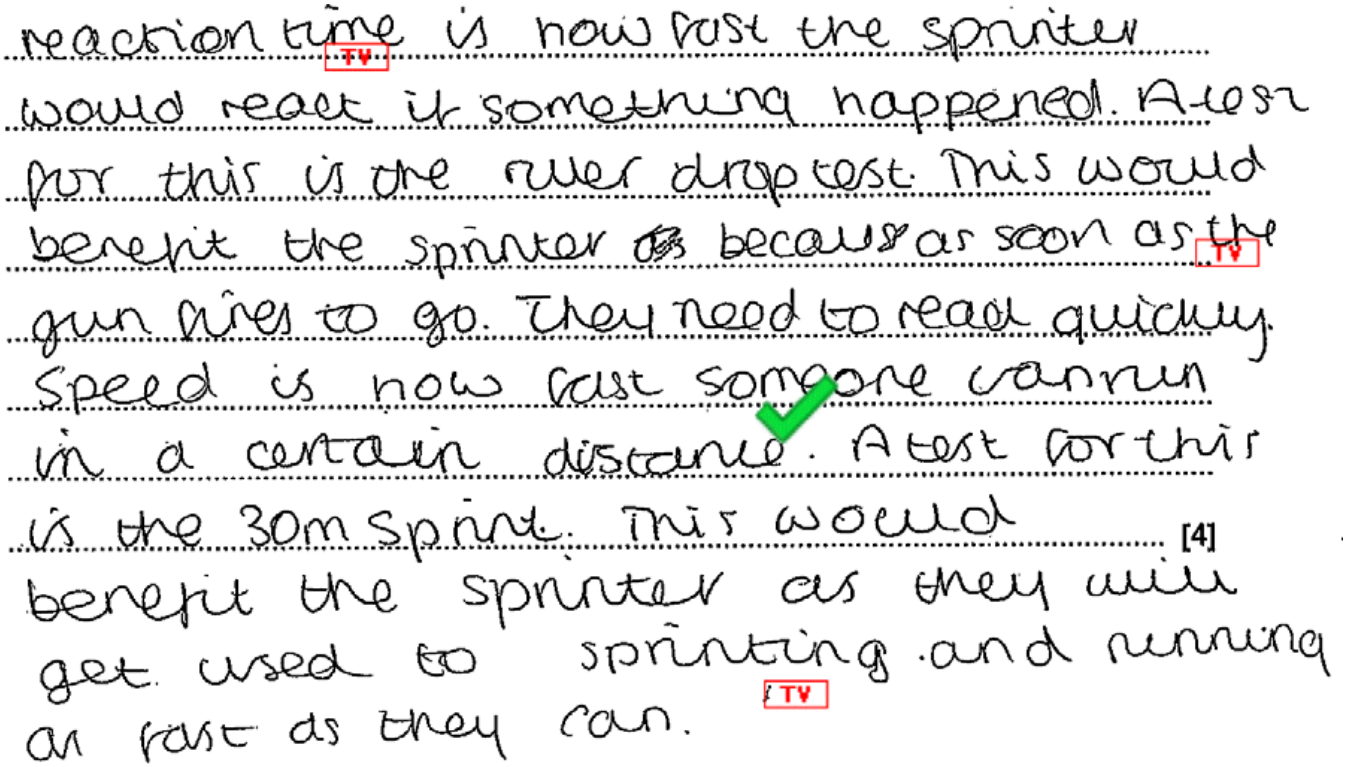
..... **[4]**

This question required candidates to show an understanding of two fitness components and to apply them to a 100m sprinter, showing the importance of each to the sprinter. Most candidates correctly defined speed, and many responses outlined the importance of both components. The best responses gave an accurate definition of reaction time, which did not include the word 'react'. The time taken to respond (rather than react) to a stimulus was an acceptable answer.

Exemplar 5



This response scored one mark. The definition of reaction time uses the word 'react' in the definition. An alternative word, such as 'respond' would make this a suitable definition. The definition of speed is not a standard definition, but gives enough information to gain a mark. The response does not explain how either fitness component helps a sprinter perform well.

This response could be improved by stating that a fast reaction time would mean the sprinter gets ahead of the other competitors, and that speed is important to run faster than their competitors to win the race.

Question 22(b)

(b)* Before an athlete participates in a sprint they will complete a warm up to prepare their body and mind for the race.

Using practical examples, describe the components of a warm up and evaluate the different mental preparation techniques that could be used to fully prepare the athlete for the race.

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..... **[6]**

This question is a 6 mark extended response question with a levels of response mark scheme. It required candidates to show knowledge and understanding of the components of a warm up, and to apply that knowledge to give examples of suitable exercises for a sprinter. Furthermore, candidates needed to evaluate mental preparation techniques that would help a sprinter prepare for a race.

Most responses listed some of the components of a warm up and gave suitable examples. They also named at least one mental preparation technique, and attempted to make some form of evaluation of that technique that would benefit the sprinter. The best responses showed evidence of planning so that a logical, well-presented answer was produced. Each component of a warm up would be described, and exercises would be given. Several mental preparation techniques would also be outlined and evaluated. For example, selective attention helps a sprinter focus on the event and block out distractions, while positive thinking increases confidence and determination to do well. A few higher ability candidates also evaluated the limitations of mental preparation techniques, although this was not required to access the highest level of response. Many responses included practical applications to other sports, particularly when giving examples for the skill rehearsal element of the warm up. Candidates are reminded that their answers need to be relevant to the specific requirements of the question, and that wider synoptic links will not gain credit.

While the majority of candidates responded to both aspects of the question, some candidates did not address both, or only covered one aspect superficially (in some instances more information was provided on mental rehearsal than on warm up).

It is a requirement that the extended response question (denoted with *) in each exam paper makes some link to content from the other examined component in the specification. We will always endeavour to make the link a natural and logical one in the context of the question set.

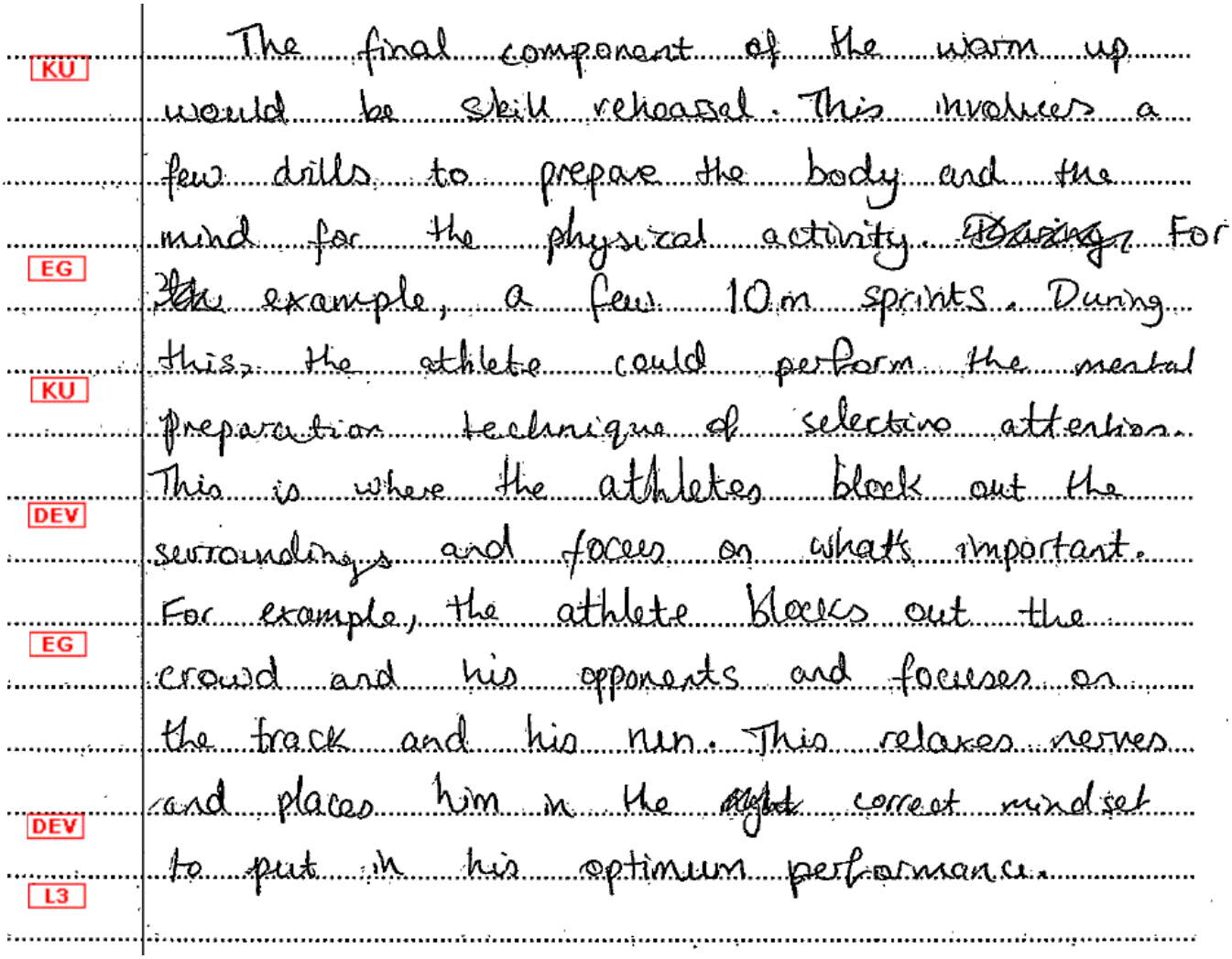
Exemplar 6

KU The first component of a warm up is the pulse raiser. ~~The pulse raiser~~ For example, a EG quickened jog around the ~~pitch~~ track. The pulse ~~raiser~~ pulse raiser gradually increases heart KU rate and prepares the heart for their exercise. During the pulse raiser, the athletes could KU perform the mental preparation technique of imagery. ~~This~~ This technique creates positive KU images about the exercise/sporting event that is about to occur. For example, the sprinter EG ~~image~~ creating an image of them crossing the finishing line in a good time. This prepares DEV the athlete as it gives them a feeling of DEV satisfaction and increases concentration.

KU The next component of a warm-up is KU stretching, both dynamic and static. Begin EG with dynamic stretches e.g hamstring sweeps then afterwards, perform some static stretches, EG e.g gastrocnemius stretch. This gradually increases KU muscle temperature and increases the elasticity of the muscles to prepare the athlete for the race. Whilst doing this, the athlete could perform the mental preparation technique of [6]

22)b) KU Mental rehearsal. ~~The~~ Mental rehearsal involves external and internal imagery of the performer rehearsing what they are going to do. For example, the athlete rehearsing getting into starting position and the movement he'll perform EG once he hears the gun. This increases ~~focus~~ DEV their focus and speeds up reactions during the DEV activity.

KU The next component of a warm up would be ~~dynamic movements~~ mobility. This involves dynamic movements. ~~eg. under steps and skipping~~ For example, EG the athlete could perform lunges to open up his groin and hip flexor. This warms up the joints and prepares the body for exercise. During this component of a warm up, the KU athlete could perform the mental preparation technique of ~~selective attention~~ positive thinking. ~~Visualisation~~ This is where he encourages himself DEV with positive, motivating thoughts to increase DEV his confidence and relaxes his nerves. For EG example, he repeats to himself "come on, you can do this! You're going to win this race!"



This response was a Level 3 response that scored six marks. Each component of the warm up is described with a practical example for a sprinter. After each component, a mental preparation technique is named, described and evaluated, with at least one benefit for the sprinter given for each technique. The response shows detailed knowledge and understanding, consistent practical application and effective evaluation.

Question 23(a)

23 **Fig. 6** below shows the respiratory rate for two hockey players before, during and after a match.

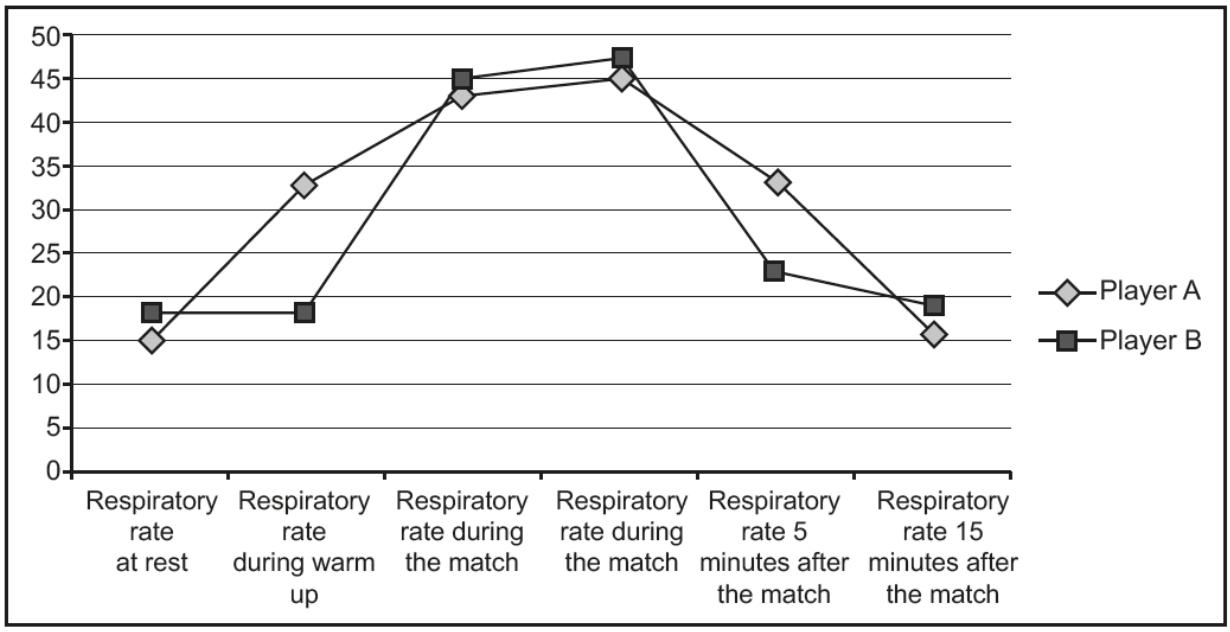


Fig. 6

(a) Using the information in **Fig. 6**, analyse how the two players' respiratory rates compare and why they may be different.

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

This question required candidates to analyse the data shown in the graph and many responses did this well. For example, player A's lower resting respiratory rate suggests that s/he is fitter than B; A's respiratory rate suggests s/he did an active warm up and an active cool down: B's respiratory rate suggests s/he may have been working harder than A during the match. Some candidates misunderstood the graphs to be showing heart rate, however, if their analysis of the data was correct, credit could still be gained.

Question 23(b)

(b) Explain the role of respiratory muscles during inspiration while player A is performing in the hockey match.

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

Some responses to this question were very detailed and showed excellent understanding of the mechanics of breathing. Higher ability candidates stated that the diaphragm and external intercostal muscles contracted during inspiration, causing the ribs to move up and out. This increased the volume of the thoracic cavity, decreasing the pressure inside the lungs, which resulted in air being drawn in. Some candidates described the structures of the lungs, or explained why more air was needed in the lungs. This knowledge was not required by this question.

Question 23(c)

(c) Analyse the effects that lactic acid could have on the performance and recovery of the hockey players.

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

Many candidates produced detailed responses which explained that lactic acid causes pain and has a negative effect on performance. Others highlighted that a build-up of lactic acid causes fatigue in muscles. Most responses recognised that the question required an effect of lactic acid on recovery and correctly stated that lactic acid increases recovery time.

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