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GCSE (9-1)

Examiners' report

PHYSICAL EDUCATION

J587

For first teaching in 2016

J587/01 Summer 2023 series

Version 1

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Contents

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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 answers 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:
• read each question carefully to make sure answers were relevant and underlined or circled key words in the question • understood the difference between structure and function • gave detailed explanations in their extended response answer.	• misinterpreted parts of some questions • answered with irrelevant information • left some questions unanswered • gave descriptions when explanations were required.

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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; short responses.

Question 1

1 Name a suitable test for strength.

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

Many responses correctly identified a suitable test for strength. Some responses named tests for other components of fitness which were not required and were not given the mark.

Question 2 (a) (i)

2 The image below shows a football player kicking a ball.

(a) (i) State the type of movement that has taken place at the left knee.

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

Question 2 (a) (ii)

(ii) Identify the class of lever used at the **knee** when kicking a ball.

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

Candidates who understood the structure of the knee joint applied this knowledge to identify that the lever system at the knee during extension is a third-class lever.

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Assessment for learning

Centres are reminded that the specification says:

'In many areas of this specification, it is expected that practical examples from physical activities and sports will be used to show how theoretical concepts can be applied'.

Centres are encouraged to develop understanding through analysis of joint movements in sport. Students should be taught to independently analyse sporting movements and apply their knowledge and understanding of anatomy and physiology to a wide range of scenarios.

Question 3 (b)

(b) Describe **two** benefits of cooling down after a basketball game.

1 .....

.....

2 .....

.....

[2]

The most successful responses gave two correct benefits of cooling down after a basketball game. Less successful responses stated processes that happen after exercise naturally, without the help of cooling down. Some candidates misunderstood the question and named the two components of a cool down.

Misconception

Many responses did not address the benefits of cooling down. These are listed in the specification content. Instead, candidates often described changes that happen after exercise. Candidates are reminded that the benefits of cooling down must help the processes that occur naturally without a cool down. For example, lactic acid will be removed without a cool down, but the process will take longer. Therefore, the benefit of cooling down is to speed up lactic acid removal.

Candidates are also reminded that if two responses are asked for, a third response will not be considered.

Exemplar 1

1 removes lactic acid from muscles

.....

2 gradually lowers heart and breathing rate.

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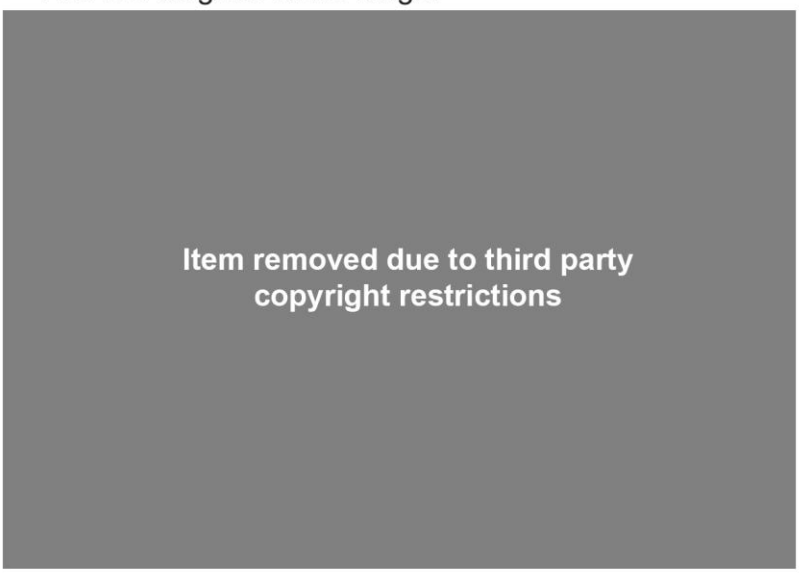
The question paper is scaffolded to indicate where each of the two responses should be written. The first answer is too vague because it does not say that cooling down helps or speeds up the removal of lactic acid. The place in the scaffold for the second response has a response that correctly describes two benefits of cooling down, namely gradually lowering heart and breathing rate. So, three answers have been offered by the candidate. Only the first two answers can be considered because the question specifically asks for two benefits. The first response has already been marked as too vague. Therefore, 'gradually lowers heart rate' is credited and 'gradually lowers breathing rate' must be ignored.

Question 4 (a) (i), (ii) and (iii)

4 This is a diagram of the lungs.



(a) (i) Name the structure labelled **A**.

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

(ii) Describe the direction of movement of oxygen that takes place at the structure labelled **A**.

.....

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

(iii) Describe **one feature** of the structure labelled **A**.

Describe **one function** of the feature you have described.

Feature: .....

.....

Function: .....

.....

[2]

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Most responses correctly named A as alveoli or an alveolus. Incorrect answers for A included bronchioles and capillaries. Candidates who did not gain a mark for naming A correctly could still answer Question 4(a)(ii) correctly. For Question 4(a)(iii) credit was given for a feature and a correct function of the named feature of the alveoli, even if alveoli were not named in Question 4(a)(i). Responses that did not describe a feature of alveoli could not be given a mark for the function as this had to be linked to the feature.

A few candidates did not attempt to answer Question 4(a)(iii).

Assessment for learning

Students should be taught that the alveoli are where gas exchange takes place. Furthermore, the specification content states that students should understand about alveoli as the site of gas exchange. This means that they need to understand how the structure of alveoli helps gas exchange to occur. For example, gas exchange will happen to some extent with only a few alveoli present. The existence of millions of alveoli creating a large surface area means that much more diffusion takes place.

Question 5

5 Other than warming up, suggest **two** measures that can help minimise the risk of injury to a volleyball player before they play a game of volleyball.

1 .....

.....

2 .....

.....

[2]

This question requires knowledge of measures to minimise the risk of injury to be applied to the specific example of a game of volleyball. Answers were accepted if they referred to the surface/pitch or floor rather than the court. However, a general statement about equipment not put away did not show any application to the game of volleyball and did not gain credit as a result. Answers could be general, for example, wear personal protective equipment, or specific, e.g., wear knee pads. This was to make sure that candidates with limited knowledge of volleyball could still access all the marks in the mark scheme.

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Misconception

Some candidates did not read the question carefully enough. This question asks for measures that can be done before a game, other than a warm up. Some responses gave two components of a warm up. Others described playing with correct technique, which can only occur during a game. Some stated that a cool down would help. Candidates are reminded to read questions carefully. Many more successful responses circle or underline key words in the question to help understand and make sure answers are relevant.

Question 6 (a) (ii)

(ii) Describe the structure of the vena cava.

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

Many candidates identified that the vena cava is a vein. However, unlike most veins it does not contain pocket valves to prevent backflow. This question does not ask for one named structure so candidates who described more than one structure were given credit for a correct response even if other answers were wrong. Some candidates described the function of the vena cava and did not gain credit for this as it did not answer the question. A small number of candidates did not attempt this question.

Question 8

8 Define what is meant by a synovial joint.

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

More successful responses identified that synovial joints are freely moveable joints. Less successful responses showed a lack of knowledge or a misreading of the question and described a joint as a place where two or more bones meet. Some responses named features of a synovial joint. These features alone do not define what is meant by a synovial joint.

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Question 12 (a) and (b)

12 (a) Describe a surface hazard found on an **artificial** cricket pitch.

.....

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

(b) Describe a **different** surface hazard found on a **grass** cricket pitch.

.....

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

Both parts (a) and (b) of this question were generally well answered. A wide range of possible hazards were credited. There were more correct answers for a grass cricket pitch than an artificial cricket pitch. Very few responses gave the same hazard for both surfaces.

Question 13

13 Drowning is a potential **hazard** when swimming.

Is this statement true or false?

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

The responses to this question were almost equally split. Students are reminded that hazards tend to be objects or people, in this case the water. Hazards are not the outcome, such as drowning, which is a risk when the hazard is present.

Question 15

15 What does 'pliability of ligaments and tendons' mean?

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

More successful responses explained that pliability refers to the amount of elasticity or flexibility in these tissues. Responses which stated that pliability allowed movement were also given the mark. Less successful responses tended to link pliability to strength or stated a function of one or both connective tissues. Some candidates did not attempt this question.

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Question 17

17 Name a **sports skill** that only has the same plane of movement as a somersault.

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

A wide range of sports skills were named and those that only move through the sagittal plane were credited. In many sporting situations a front somersault is referred to as a front flip and a back flip is equivalent to a back somersault, so these responses were not credited. Candidates are reminded that they need to produce correct sporting examples that do not include movements in other planes. Complex examples such as a tennis serve, bowling in cricket or throwing a ball should not be used for this reason.

Question 19

19 Intensity is part of FITT and describes how hard the training is.

Using a **practical example**, describe how a sprinter can **increase** the intensity of their training.

.....

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

The best responses showed a clear increase in intensity, often using actual examples to support their answers. Sprinters do a variety of training so answers showing an increase in weight training, for example, were given the mark. Some responses showed examples of overload but did not specify an increase in overload and were therefore too vague to be given the mark. Other responses implied an increase in duration which is the time element, not the intensity part of FITT, and did not gain credit. Candidates who misread the question and stated how a different sports performer, such as a footballer, could increase intensity, were unable to gain the mark.

Assessment for learning

Candidates are encouraged to practice applying knowledge in a range of situations. This is particularly relevant to the FITT principles of training and the principles of training. Answers should differentiate between increasing each of frequency, intensity and time for a range of popular sports. Candidates should also prepare to make comparisons and show differences between the training programmes of two different sports performers, and between performers of varying ability and fitness.

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Section B overview

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

Question 21 (a) (i), (ii), (iii) and 21 (a) (iv)

21 (a) Stamina can be measured using the multi-stage fitness test.

The table below shows a set of results, using the multi-stage fitness test, for hockey players before and after pre-season training.

Players	Before pre-season training	After pre-season training	Ratings for Levels
Alex	Level 5	Level 6	Excellent: 13+ Very good: 11–12 Good: 9–10 Average: 7–8 Poor: 5–6 Very poor: <4
Charlie	Level 7	Level 10	
Finley	Level 9	Level 8	
Li	Level 11	Level 15	
Zayn	Level 6	Level 11	

(i) How many players had an **above** average rating **before** pre-season training?

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

(ii) Name the player who **improved** their stamina the most during pre-season training.

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

(iii) Name the player who experienced **reversibility** in stamina during pre-season training.

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

(iv) Name another suitable test to measure the stamina of hockey players.

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

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Question 21(a) was well answered by most candidates who showed an ability to analyse and interpret data from a table of results. A few candidates misread Question 21(a)(i) and included a third person who had an average rating before pre-season training. Some candidates did not go back and review the question when answering Question 21(a)(iv). This asked for another suitable test to measure stamina. Therefore, the multi-stage fitness test could not be given as an answer.

Centres are reminded that they should call the multi-stage fitness test by its correct full name so students are aware that this is its proper name, as terms such as the bleep test or beep test will not be accepted in an exam. This is because there are different bleep tests that measure a different component of fitness. For example, the abdominal curl conditioning test is also a bleep test that measures muscular endurance.

Question 21 (b)

(b) Suggest **two** reasons why some hockey players in the table above have made less improvement than others during pre-season training.

1 .....

.....

2 .....

.....

[2]

The most common responses suggested that some made less improvement than others because they did not train as hard, and that they could not train because of an injury. Some responses gave opposite arguments, for example, some put in more effort than others. This was acceptable as an alternative for lack of effort. Some candidates missed out on a second mark because they offered the same reason in two opposite ways.

Assessment for learning

Candidates are strongly recommended to plan their answers before committing to paper. For this question, only the first two different reasons can be credited. Some candidates offered a third valid reason that could not be credited because two other answers had already been written.

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Question 21 (c)

(c) Describe the two principles of training stated below.

Give a practical example from **swimming** for each principle of training you have described.

Specificity: .....

.....

Practical example: .....

.....

Progression: .....

.....

Practical example: .....

.....

[4]

The most successful responses gave clear descriptions for each principle of training, and offered a detailed practical example that was applied to swimming. Many responses repeated the words 'specific' and 'progressive' without developing an answer that described each principle clearly. Some practical examples were applied to other sports and were not relevant to swimming.

Some candidates linked the terms to goal setting and did not make them relevant to training.

Exemplar 2

Specificity: the training must be specific to the sport, muscle group and individual

Practical example: a swimmer will train front crawl in a pool (to improve sem freestyle) rather than running a marathon.

Progression: training should gradually get harder so the performer improves

Practical example: for example a swimmer may increase the number of lengths in a training session each week

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In Exemplar 2, the description of specificity is not accurate enough because it uses the word 'specific' without replacing it or supporting it with an alternative synonym such as 'relevant' or 'meets the demands'. The description of progression is correct. Both examples are excellent ways of applying the principles of training to swimming.

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Question 22 (a)

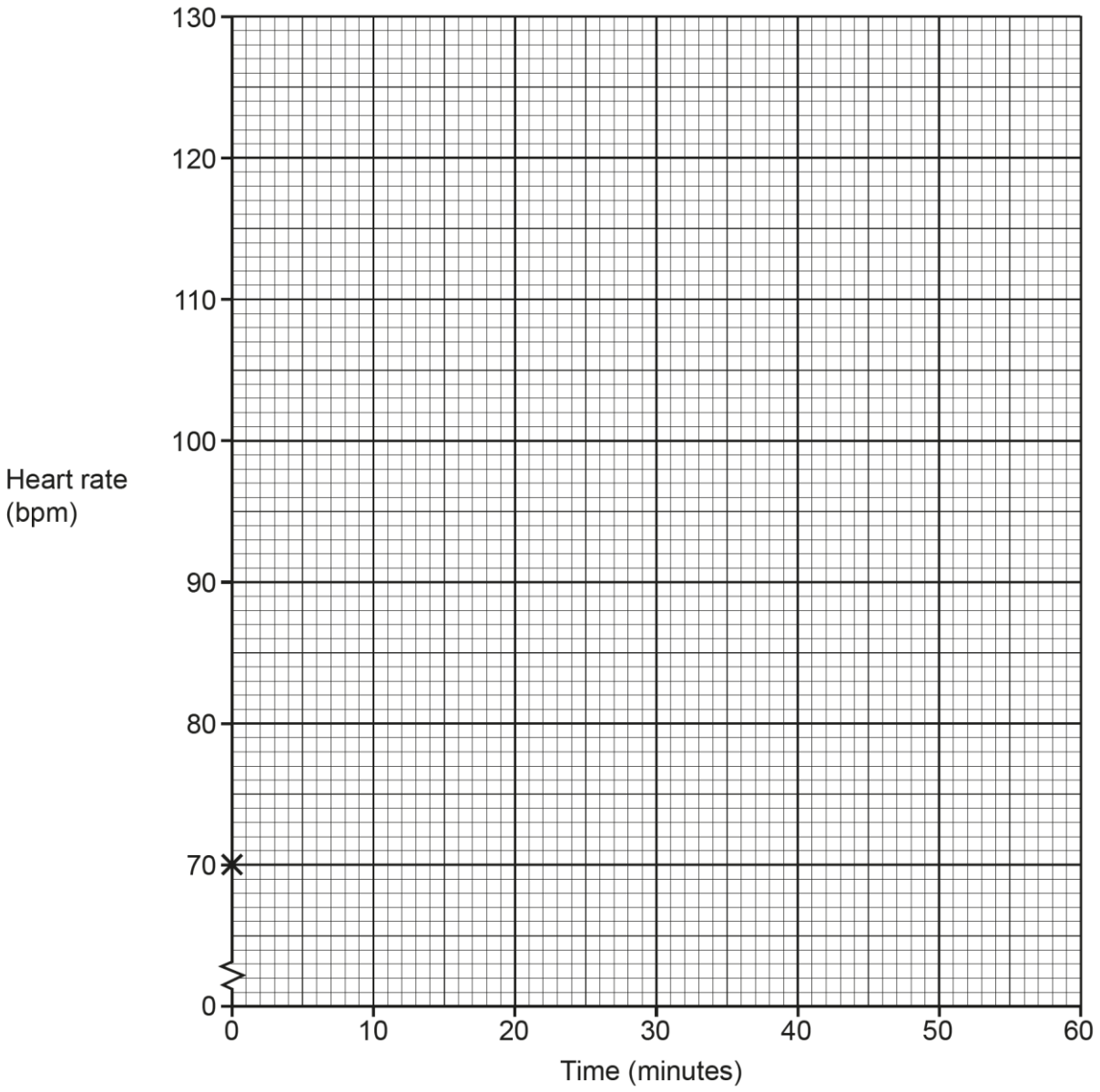
22 (a) Sam's heart rate is monitored while they complete a 20-minute training session with a warm up and a cool down.

The following changes are recorded:

- 10 minute warm up – heart rate increases by 15 bpm
- First half of training session – heart rate increases to 110 bpm
- Second half of training session – heart rate remains constant
- Following 15 minute cool down – heart rate drops to 80 bpm.

Plot the **four** changes to Sam's heart rate on the graph below.

Sam's resting heart rate is already shown on the graph as 'X'.



[4]

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Most candidates showed an ability to plot points accurately on a graph. Candidates who made an error plotting the third point were able to gain credit for the fourth point if it was plotted 15 minutes after the third point and at 80 beats per minute.

Question 22 (b) (i)

(b) (i) Other than an increased **heart** rate, describe **three** short-term effects of exercise on Sam's **cardiovascular** system.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

Most responses stated that stroke volume and cardiac output increase as short-term effects of exercise on the cardiovascular system. More successful responses gave a third correct answer. Less successful responses did not describe three effects and included responses that described long-term effects on this system or described short-term effects on the respiratory system. Responses describing an increase in lactic acid needed to be applied to the cardiovascular system by linking lactic acid to the blood. This was to differentiate from lactic acid in muscles which would be a short-term effect on the muscular system.

Question 22 (b) (ii)

(ii) Other than an increased **breathing** rate, describe **three** short-term effects of exercise on Sam's **respiratory** system.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

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The most successful responses described an increase in tidal volume and minute ventilation and an increase in gas exchange. Less successful responses tended to include cardiovascular responses to exercise, or left spaces to indicate that they were unable to produce valid descriptions of short-term effects of exercise on the respiratory system.

Question 23 (a) (i)

23 (a) (i) Describe **two** differences between **aerobic** and **anaerobic** exercise.

1 .....

.....

2 .....

.....

[2]

More successful responses showed good exam technique by making each difference between aerobic and anaerobic exercise very clear. Candidates are reminded that questions that ask for differences or use the command word 'contrast' need to outline exactly how each feature differs from one concept to the other.

Some candidates only offered one difference. Other candidates got the two types of exercise mixed up and gave opposite wrong answers.

Misconception

There were two misconceptions to be highlighted. The first was an assumption that the examiner would know which type of exercise the candidate was comparing with the other. For example, 'one uses oxygen and the other doesn't' shows a difference but is not clear enough to gain credit at this level. Candidates are recommended to start each sentence with the subject, in this case 'aerobic exercise', state the feature and then follow this with the other subject and state how that feature differs.

The second misconception was made by less successful candidates who stated one difference but spread this across the two numbers of the scaffold. Some of these candidates may have thought making two points to show one difference would be enough.

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Question 23 (a) (ii)

(ii) Using events from track and field athletics, state one **aerobic** event and one **anaerobic** event.

Aerobic event: .....

Anaerobic event: .....

[2]

Candidates were asked to use events from track and field athletics and the specification is clear that candidates may be asked to offer examples from a range of common sporting activities. Centres are reminded that students are expected to have experienced activities such as athletics and gymnastics at some stage of their secondary physical education. If not, these gaps in knowledge should be addressed during the course in either a theoretical or a practical way. In some areas of the country the distances of track events are modified at official athletics meetings and these distances were credited.

Some answers did not specify an event and were deemed too vague to be given the marks.

Some responses showed a lack of understanding of the terms aerobic and anaerobic or misread the terms and gave events that were not appropriate for the energy system named in the scaffold.

Question 23 (b)*

(b)* Exercise can **improve** physical and mental health.

Living a sedentary lifestyle can have **negative** impacts on mental health.

Explain the **long-term** benefits of exercise on the cardiovascular system.

Using practical examples, describe the **emotional** and **social** consequences of a sedentary lifestyle. **[6]**

The most successful responses gave detailed explanations of long-term benefits of exercise on the cardiovascular system and covered adaptations to the blood and blood vessels as well as the heart. These responses also described a range of social and emotional consequences of a sedentary lifestyle, using good examples to support their answer. As in previous years there was often evidence of planning to structure answers in a clear and logical fashion by the most successful candidates.

However, many responses gave a list of long-term cardiovascular benefits but did not develop these descriptions into explanations as demanded in the question. Moreover, many candidates chose to describe the benefits of an active lifestyle without explaining that those who adopt a sedentary lifestyle miss out on these benefits and experience the negative consequences instead.

Candidates are reminded to plan their answers and revisit the question to make sure answers stay relevant.

Candidates are also reminded that answers that are correct but not relevant will not gain any marks, for example, benefits to other body systems or physical consequences of a sedentary lifestyle.

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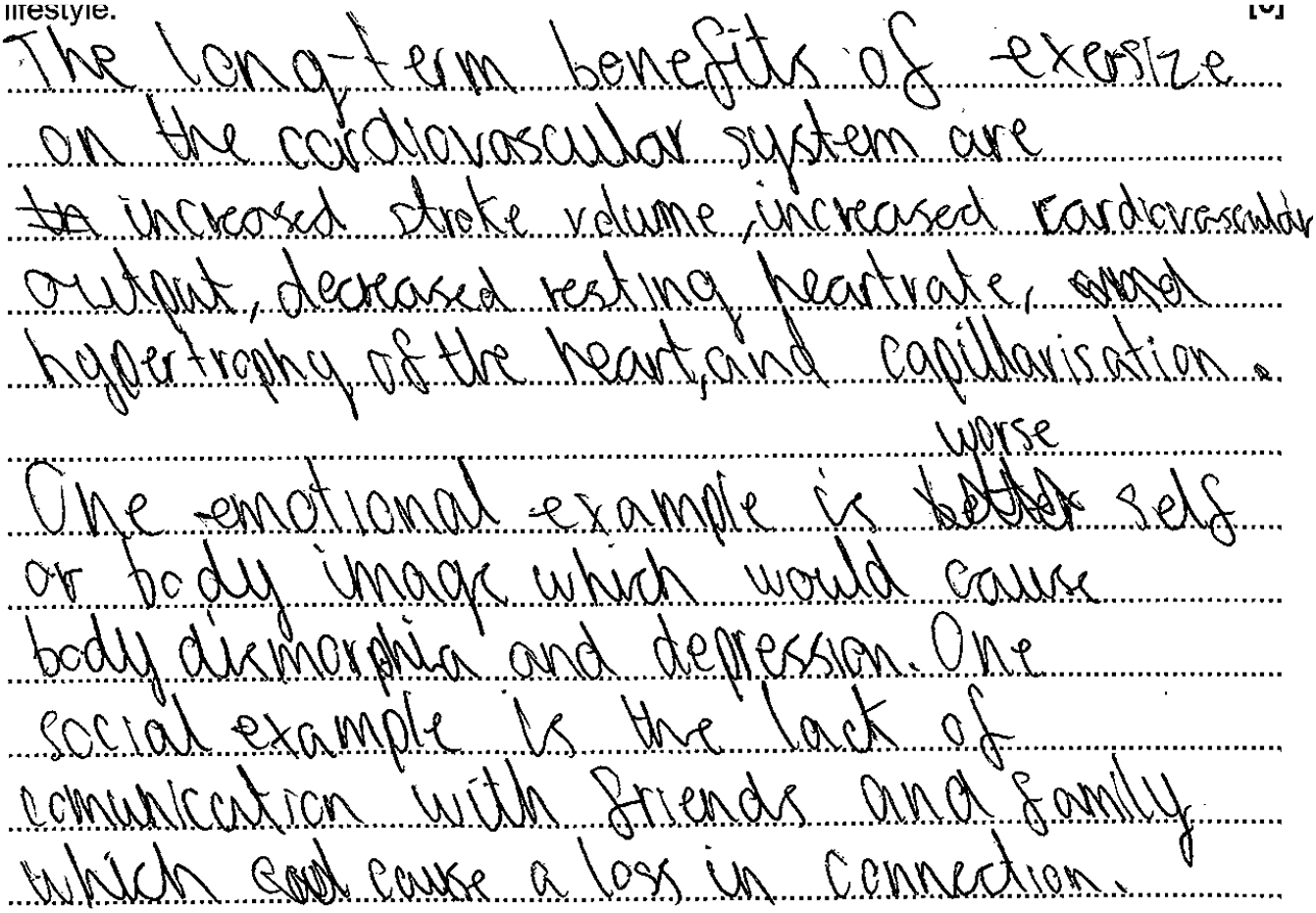
Exemplar 3


lifestyle. [6]

The long-term benefits of exercise on the cardiovascular system are ~~the~~ increased stroke volume, increased cardiovascular output, decreased resting heartrate, and hypertrophy of the heart, and capillarisation.

One emotional example is ~~better~~ worse self or body image which would cause body dismorphia and depression. One social example is the lack of communication with friends and family, which ~~could~~ cause a loss in connection.

Exemplar 3 is a Level 1 response. Four long-term benefits of exercise on the cardiovascular system are described but none of these are developed into an explanation. There is basic knowledge and understanding of the consequences of a sedentary lifestyle. These are listed but not linked to practical examples, other than the mention of body dysmorphia. To improve this response the candidate needs to explain the benefits of each of the cardiovascular adaptations that are listed, and to use practical examples to exemplify the emotional and social consequences of a sedentary lifestyle.

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