

AS LEVEL

Examiners' report

PHYSICAL EDUCATION

H155

For first teaching in 2016

H155/01 Summer 2022 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 answers are 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.

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

Advance Information for Summer 2022 assessments

To support student revision, advance information was published about the focus of exams for Summer 2022 assessments. Advance information was available for most GCSE, AS and A Level subjects, Core Maths, FSMQ, and Cambridge Nationals Information Technologies. You can find more information on our [website](#).

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Paper 1 series overview

There were some very good scripts offered in response to the Summer 2022 H155/01 examination paper, yet performance overall, quite logically varied greatly. The focus on AO1, AO2 and AO3 in centres appears to have clearly been embedded. Now that the specification is a few years old there is evidence that centres have a good grasp of what is required at the exam level. Candidates appear to understand what is required of them throughout all four sections and there was almost no evidence of candidates misinterpreting questions. Candidates clearly addressed the command words well in the majority of cases and followed the rubric of the paper accurately.

In response to the 10-mark question which required longer answers and different examination technique, candidates continue to show evidence of knowing the five generic criteria: 1. Knowledge and understanding, 2. Development of knowledge, 3. Examples, 4. Technical Vocabulary, and 5. Good quality of written communication. The question asked for candidates to describe methods of measuring types of strength specific to a heptathlete and evaluate the use of force plates in helping a heptathletes performance. Overall AO1 and AO2 were covered well, however the majority of candidates were unable to apply their answers in any depth to the heptathlete and the types of measurement which would best suit a heptathlete, so missed AO3 marks.

Candidates who did well on this paper generally did the following:	Candidates who did less well on this paper generally did the following:
<ul style="list-style-type: none"> • interpreted the stroke volume heart rate graph accurately • were able to explain how the muscle and respiratory pumps cause changes to venous return during exercise and recovery • were able to evaluate glycogen loading using positives and negatives • were able to analyse how cardiovascular adaptations affect a sports performer • were able to describe all four lifestyle diseases of the cardiovascular system • were able to explain the unbalanced forces on the upward phase of vertical jump • included efficiency speed and range lever systems • were able to relate methods of assessing strength to the heptathlete and give several positive evaluations of force plates. 	<ul style="list-style-type: none"> • didn't show workings for the heart rate / stroke volume calculations • confused litres and millilitres in units for cardiac output • misinterpreted the requirements of the question about venous return during exercise and recovery • made vague definitions for breathing frequency and tidal volume • included Internal intercostal muscles as contracting at rest • were unable to evaluate the performance effects of glycogen loading • didn't analyse cardiovascular adaptations • did not use specific sporting examples for periodisation cycles • considered asthma and cancer as lifestyle diseases of the CV system • only managed to give the lever system number without explanation • were not able to relate methods of assessing strength to the heptathlete and chose the wrong method for the component of strength.

Question 1 (a)

1 (a) Fig. 1.1 shows a performer stretching their right leg.



Fig. 1.1

Complete the table to analyse the movement at the right ankle joint as it moves in the direction of the arrow.

Joint	Movement	Agonist muscle	Type of contraction	Plane of movement	Fixator muscle
Right Ankle					

[5]

This question was generally well answered. The best candidates also included the correct fixator muscle, however the majority appeared to understand the concept of a fixator in the leg.

Question 1 (b)

(b) Fig. 1.2 is a graph showing the changes in heart rate and stroke volume for a performer from rest to maximal exercise and during a period of recovery.

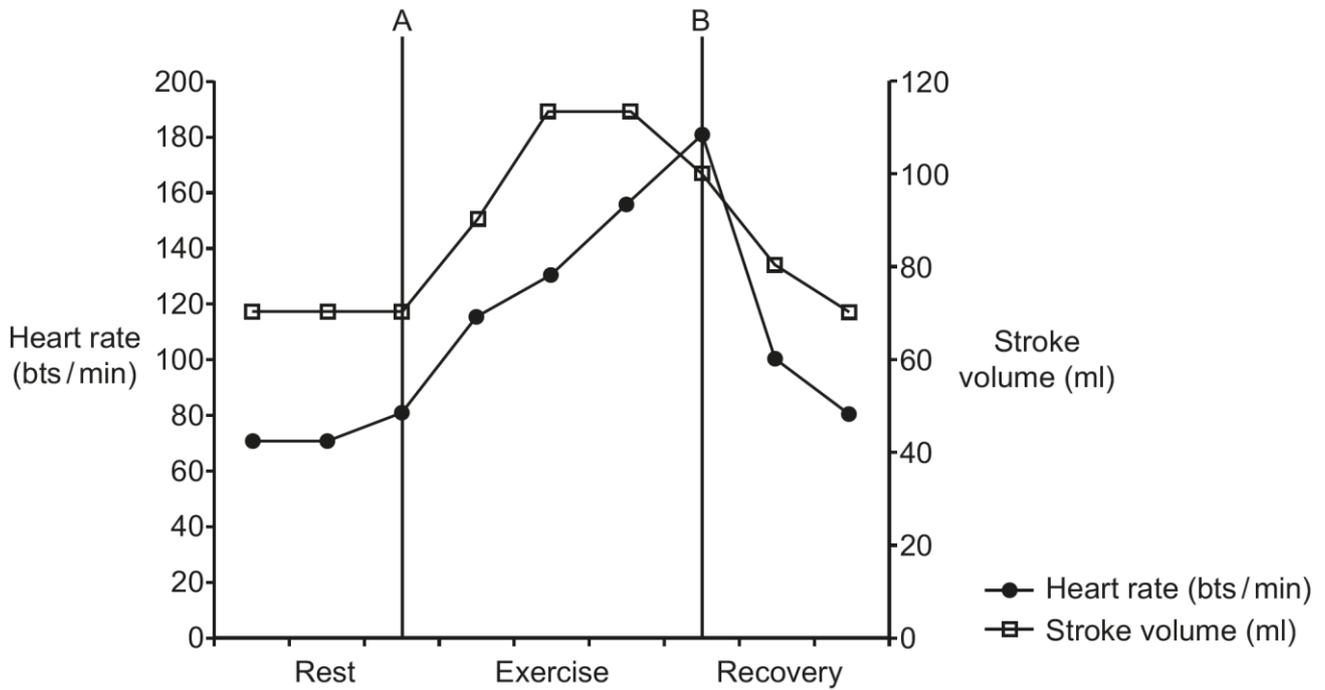


Fig. 1.2

Heart rate and stroke volume are used to calculate cardiac output.

Use the data in Fig. 1.2 to calculate the cardiac output at point A and at point B, shown by the vertical lines.

What is the increase in cardiac output between points A and B?
Show your workings.

Cardiac output at point A

.....

.....

.....

Cardiac output at point B

.....

.....

.....

Increase in cardiac output between points A and B

..... [5]

Graph misinterpretation

Many candidates used the data from the left hand side of the graph for both heart rate and stroke volume. They were still given marks if their calculations were correct even if they had used the wrong numerical value for the stroke volume. Very few were able to interpret the graph – 3 points given if maths was correct which is where most scored marks – many lost marks as they did not use of units.

Question 1 (c) (i)

(c) Venous return is the movement of blood from the veins to the right atrium of the heart.

(i) Two mechanisms that aid venous return are the muscle pump and the respiratory pump. Describe these **two** venous return mechanisms.

Muscle pump:
.....
.....

Respiratory pump:
.....
.....

[2]

Candidates showed appropriate understanding but did not express themselves correctly in their answers – they were too vague. In the mark scheme we were particularly looking for candidates to describe the effect on the veins for the muscle pump and the pressure changes in the respiratory pump.

Exemplar 1

Muscle pump: This is where skeletal muscles contract, squeezing the veins they surround forcing blood back up to the heart

Respiratory pump: an ^{Decrease} ~~increased~~ pressure in thoracic cavity is created by inhalation, ^{Pressure in blood very low, pressure} ~~that pressure diffuses into blood~~ ^{maes from} ~~stream~~ ^{high to low} so blood returns back to heart, also during expiration pressure is ~~decreased~~ ^{increased} + forced through blood vessels moving blood back up to heart [2]

This is a good example of a candidate completing the question fully with reference to veins in the muscle pump and pressure assisting respiratory pump.

Question 1 (c) (ii)

- (ii) Explain how the muscle and respiratory pumps cause changes to venous return during exercise and during recovery.

Exercise:

.....

.....

Recovery:

.....

.....

[2]

Many candidates repeated answers given in 1 (c) (i)– very little reference was made to more muscle contractions / breathing or fewer contractions. If candidates did get it correct, they often forgot to link with VR as an increase or decrease.

Question 1 (d) (i)

- (d) (i) Define the terms breathing frequency and tidal volume and give a resting value for each.

Breathing frequency:

.....

Resting value:

Tidal volume:

.....

Resting value:

[4]

A common mistake was breathing in **and** out – tidal volume often linked to heart beats. Units not used for resting values and often the resting values used were incorrect.

Question 1 (d) (ii)

(ii) The muscles that contract during breathing at rest are:

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

- A Diaphragm and external intercostal muscles
- B Diaphragm and internal intercostal muscles
- C External intercostal and internal intercostal muscles
- D External intercostal and sternocleidomastoid muscles

[1]

Generally, well answered question. Some candidates considered 'C' with internal intercostals not external.

Question 2 (a)

2 (a) Glycogen or carbohydrate loading is a nutritional ergogenic aid.

Evaluate the use of glycogen loading to aid performance in sport.

.....

.....

.....

.....

.....

.....

..... [5]

A large percentage of the mark was based on what and how glycogen loading was and how it was completed. Most marks given for advantages and some marks hit a good spread of disadvantages. Many candidates missed marks by not referring to the stage of the loading (depletion or loading) when identifying strengths or weaknesses.

Exemplar 2

Ans An advantage of glycogen loading is the increased amount of glycogen stores in the body.

This means that fatigue is delayed which would be helpful for long distance athletes eg. marathon runners.

A disadvantage is there is a chance of weight gain which would hinder performance in endurance events eg. long distance swimming.

There is also gastrointestinal problems when glycogen loading due to the high amount of carbohydrates being taken in.

Additionally, glycogen loading increases the risk of injury which ~~also~~ would aid performance.

This is a good example of a candidate completing the question well and balancing strengths and weaknesses successfully

Question 2 (b) (i)

(b) The aerobic capacity of a sports performer is affected by their age and gender.

(i) State **two** other factors that affect aerobic capacity.

1

2

[2]

This question was generally answered well.

Question 2 (b) (ii)

- (ii) Identify **two** cardiovascular adaptations from aerobic training and analyse how each of these adaptations would affect a sports performer.

.....

.....

.....

.....

..... [4]

Many candidates scored well and were given 4 marks.

Question 2 (c) (i)

- (c) (i) Use a sporting example to explain each of the periodisation cycles of training.

.....

.....

.....

.....

..... [3]

Candidates who had a clear understanding of the topic area generally answered this question well, highlighting the link to length of time and practical example. Less successful candidates often talked about pre-season, competitive season and recovery.

Question 2 (c) (ii)

(ii) How would the use of periodisation benefit performance in sport?

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

Candidates generally were less successful on this question. Often producing long answers which didn't hit the requirements for marks to be achieved. Those candidates who were more successful generally hit points 1,2 and 5 on the marks scheme.

Question 2 (d)

(d) Some people may develop diseases as a result of leading an unhealthy lifestyle.

Describe **four** lifestyle diseases of the cardiovascular system.

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

Poor descriptions of lifestyle diseases – many candidates described lifestyle diseases for the respiratory system and not the cardiovascular system. Points 2 and 3 often not linked to coronary artery or restricting blood flow to the heart.

Question 3 (a)

3 (a) **Fig. 3.1** is a diagram showing the stationary preparation phase, and the upward execution phase of a vertical jump.

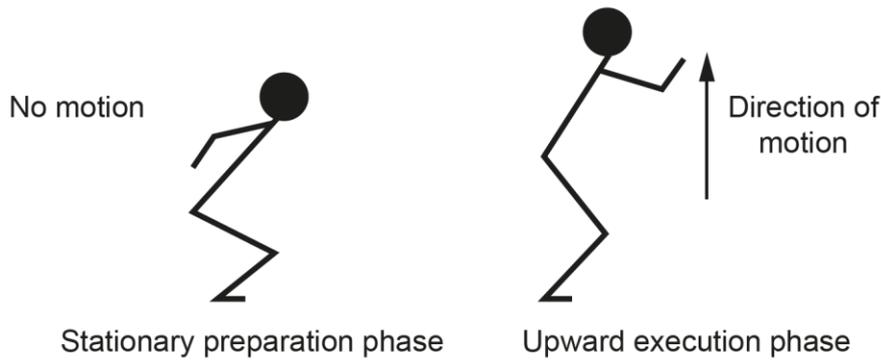


Fig. 3.1

Apply your knowledge of balanced and unbalanced forces to explain the motion in each phase of the vertical jump.

Stationary preparation phase

.....
.....
.....
.....
.....

Upward execution phase

.....
.....
.....
.....
.....

[6]

The higher performing candidates on this question hit points 1,2,3,5,6 on the marks scheme. Very few candidates referenced Newton's first law in the stationary preparation stage. Generally, candidates who mentioned point 7 in the mark scheme did not reference it being a positive force.

Question 3 (c) (ii)

- (ii) Use your diagram to suggest why and how the speed skater reduces the size of the force acting between the surface of the skate and the ice.

Why:

.....

How:

.....

[2]

This question was not answered well. Many responses showed a lack of understanding and many responses given failed to access marks,

Question 3 (d)

- (d) Define the term centre of mass and use a practical example from sport to describe a factor that affects the position of the centre of mass.

.....

.....

.....

.....

.....

..... [3]

Candidates generally did not provide a detailed and accurate definition for the centre of mass. Point 2 was often missed. Sporting examples should be relevant and needed to reference the performer changing body position.

Section B

Question 4*

4* In athletics, the women's heptathlon has seven events: 100 m hurdles, 200 m and 800 m run, high jump, long jump, shot put and javelin throw. Strength is a key fitness component for an athlete to be able to maximise performance in the heptathlon.

Describe the methods of measuring the types of strength that are most specific to a heptathlete.

Evaluate the use of force plates to aid the heptathlete's performance. **[10]**

.....

.....

.....

.....

.....

.....

A good question but few candidates managed to hit Level 3. Those candidates that did showed equal balance between describing the methods used to measure strength and evaluate the use of force plates. Those in the middle band showed good knowledge but at times did not link this to a heptathlete and often talked about just the strength tests and force plates. Many in the bottom band did not refer to heptathlete activities, giving an unbalanced answer, either hitting just strength tests or just force plates. Some candidates scored low marks due to poor knowledge.

Exemplar 3

The one rep max test is where you set a weight that is high and achievable. You perform one repetition. It can be used for any machine so can be used on several groups of muscles. This measures maximal strength and explosive so is good for shot put and javelin and can be for ~~100m~~ 200m and 100m hurdles.

The handgrip dynamometer is used as a test of maximal forearm strength. Suitable for shotput and javelin as strong grip is necessary. You ~~do~~ zero the dynamometer and raise your ~~arm~~ ^{straight} above your head and adjust to your size. Then as you squeeze taking your arm down and you can do 3 repetitions on each arm.

This is a good example of a candidate completing the question well, managing to evaluate the method of measurement and applying it to the requirements of the heptathlete. 1 RM and hand grip dynamometer done well.

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