Model Answers

AQA A-Level PE – Biomechanics
(Revision session on Wednesday 18th May 2022, 4.00–5.30pm)

This document contains:
- Model answers for the Practice Questions answered during the 2022 Revision series
- Questions in AEI order
- Where possible, examples of extended writing
- No one-mark or multiple-choice questions

How should schools use these papers?

This paper has been constructed specifically for use in preparation for and during the live revision shows provided by James Simms in May 2022. I encourage students to attempt the questions in advance of the revision shows.

Please, use these model answers in combination with the mark scheme and the revision session, available in the AQA A-Level PE Revision page (https://pages.theeverlearner.com/2022-aqa-a-level-pe-revision).

All questions are taken from ExamSimulator. Please note, there are hundreds of additional questions on ExamSimulator covering the AEI topics. ExamSimulator is a premium resource available via TheEverLearner.com.

I hope this helps both students and teachers in their exam preparations.

James Simms

1. This image shows three different projectiles from field athletics. Describe the optimal release angle for all three projectiles.

Long jump

High jump

Javelin

(1) **Long jump is the same release and landing height** and requires **(2)** **45 degrees.** High jump has **(3)** **a higher landing height than release** **(4)** **height** and **requires > 45 degrees.** **(5)** **Javelin has a lower landing** **(6)** **height than release height and requires < 45 degrees.**

No comments provided.

Marks: [6/6]

2. Evaluate the factors affecting the horizontal displacement of both a shot-put and a shuttlecock in flight.

Horizontal displacement is the shortest distance between the release height and the landing point. This is **affected by the height, angle and velocity of release**. The **greater the release height, the greater the horizontal displacement**. The greater the release velocity, **the greater the release velocity, the greater the horizontal displacement**. The flight **path of the shot is parabolic because the weight force is dominant** and air resistance is low due to the release velocity being low. **The release height is above the landing height so the** optimal angle is **< 45 degrees**. To increase release velocity, the **putter moves across the circle** and applies maximal force to the shot. The **putter also needs to release at the highest point possible** but must do so within losing release velocity. The **shuttlecock has an asymmetrical flight path** as the air resistance is very high based on the very fast release velocity. This means the shuttlecock decelerates in the air. The shuttlecock, depending on the type of shot, will typically by hit with a release **angle of < 45 degrees** as the **landing height is below the release height** and the player will try to **strike from the highest point possible** including jumping to reach higher where possible. If the badminton player hits with maximum force, the shuttle is likely to **got out at the back of the court so the player must moderate** this as required depending on their own start position.

No comments provided.

Marks: [15/15]

3. Explain how designers of F1 cars ensure the cars can travel quickly around sharp corners by applying the principles of fluid mechanics.

The **car is shaped like an inverted aerofoil so** that **air travels further under the car than over**. This means the **air above the car travels less distance** and can travel slower than the air below. Air above the car, according to Bernoulli s principle is, therefore, **at higher pressure than the air below** and this creates **a pressure differential** and a **Bernoulli lift force downward**. This **increases the friction between the tyres and the track** and the car can turn sharp corners at higher speeds without slipping.

(7) **Excellent application of point 7. :)**

Marks:[5/5]

Feedback:

No feedback provided.