Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: Waves (Standard Demand Questions)

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

Professional rugby players wear a tracking device that measures their velocity and acceleration.

Figure 1 shows a player wearing a tracking device.

The player is tackling another player who is running with the ball.

Figure 1



(a) Velocity and acceleration are both vector quantities.

What is a vector quantity?

Tick (✓) **one** box.

- A quantity with both magnitude and direction ☐
- A quantity with direction only ☐
- A quantity with magnitude only ☐

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(1)

(b) Which of the following is a vector quantity?

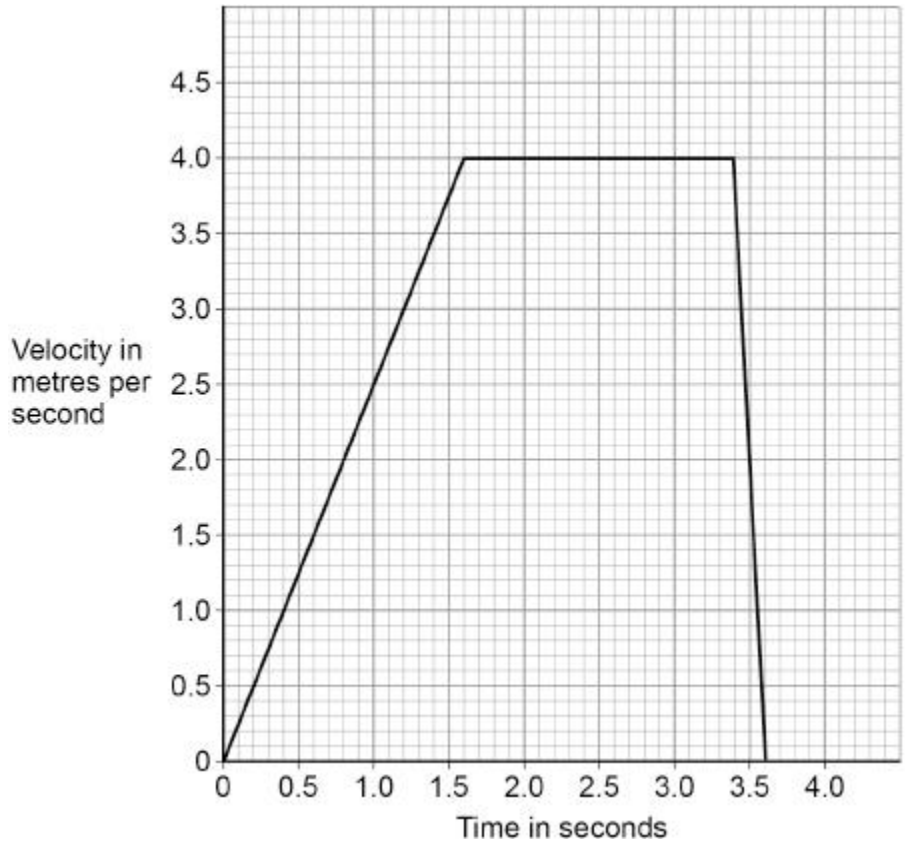
Tick (✓) **one** box.

Displacement	☐
Distance	☐
Time	☐
Work done	☐

(1)

Figure 2 shows a velocity–time graph for the player running with the ball.

Figure 2



(c) Determine the acceleration of the player between 0 and 1.6 s.

_____

_____

_____

Acceleration = _____ m/s^2

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(2)

(d) Describe the motion of the player between 3.4 s and 3.6 s.

_____

_____

(1)

The force exerted on the player when she is tackled causes her to accelerate.

(e) Write down the equation which links acceleration (*a*), mass (*m*) and resultant force (*F*).

_____

(1)

(f) The player accelerates at 25 m/s^2 when a resultant force of 1800 N acts on her.

Calculate the mass of the player.

_____

_____

_____

_____

_____

Mass = _____ kg

(3)

(g) The tracking device sends data to a computer during the game.

Suggest **one** advantage of the data being sent during the game.

_____

_____

(1)

(Total 10 marks)

Q2.

Figure 1 shows a runner using a smart watch and a mobile phone to monitor her run.

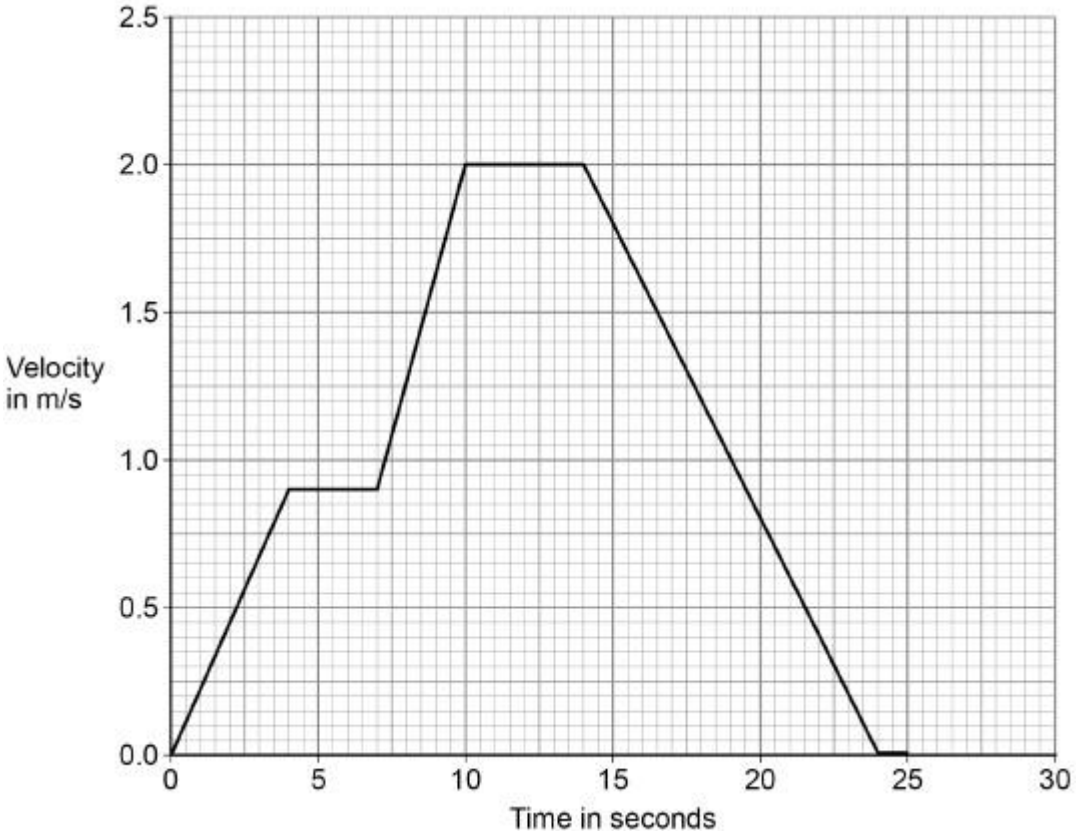
Figure 1

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Figure 2 is a velocity–time graph for part of the runner's warm-up.

Figure 2



(a) Determine the total time for which the velocity of the runner was increasing.

_____

_____

Time = _____ s

(2)

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(b) Determine the deceleration of the runner.

_____

_____

_____

_____

Deceleration = _____ m/s^2

(2)

The smart watch and mobile phone are connected to each other by a system called Bluetooth.

Bluetooth is wireless and uses electromagnetic waves for communication.

(c) Suggest why the phone and watch being connected by a wireless system is an advantage when running.

_____

_____

(1)

(d) Write down the equation that links frequency, wave speed and wavelength.

_____

(1)

(e) The electromagnetic waves have a frequency of 2 400 000 000 Hz

The speed of electromagnetic waves is 300 000 000 m/s

Calculate the wavelength of the electromagnetic waves.

_____

_____

_____

_____

_____

_____

Wavelength = _____ m

(3)

(f) The table shows some information about four types of Bluetooth.

Type	Power in milliwatts	Range in metres
1	100	100
2	2.50	10.0
3	1.00	1.00

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4	0.50	0.50

Mobile phones use type **2** Bluetooth to communicate with other devices.

Suggest **two** reasons why.

1 _____

_____

2 _____

_____

(2)
(Total 11 marks)

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