

- 1 (a) The photographs show a goalkeeper in association football diving to make a save.

**A****B**

Complete the table for the movement from position **A** to position **B**.

joint	articulating bones	type of movement	main agonist
goalkeeper's left elbow	1		
	2		
	3		
goalkeeper's right knee	1		
	2		

[6]

- (b) Suggest strategies that could be used to improve the response time of a goalkeeper.

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[3]





(c) Explain the use of Schmidt's schema theory to develop goalkeeping skills.

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[5]

(d) A goalkeeper may kick a ball along the ground.

Describe how the following forces act on a ball when it is kicked along the ground:

weight

.....

air resistance

.....

action / muscular force

.....

friction

.....

[4]





- (e) A goalkeeper may also kick a stationary ball high into the air.

Use the following laws of motion to explain the movement of this ball:

Newton's first law

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.....

.....

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Newton's third law

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[4]

- (f) State **three** factors affecting the horizontal displacement of a ball from when it is kicked until it first lands.

1

2

3

[3]





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- 2 The photograph shows runners during a cross-country race.



- (a) The performance of some cross-country runners has improved due to the use of technology.

Describe different improvements in the technology used in each of the following areas for cross-country runners:

footwear

.....

clothing

.....

[4]





(b) Suggest how the sport of cross-country running can become more commercialised.

[5]

(c) Some cross-country runners may take performance-enhancing drugs to achieve certain advantages.

Suggest different reasons why the following advantages may improve the performance of a cross-country runner:

reduce weight

reduce the effects of fatigue

mask pain

[3]



- (d) Identify **two** examples from a cross-country running event of each of the following types of motivation:

intrinsic

1

2

extrinsic

1

2

[4]

- (e) Describe changes in the following for a performer during recovery after a cross-country running race:

tidal volume

.....

minute ventilation

.....

inspiratory reserve volume

.....

expiratory reserve volume

.....

[4]



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9

Turn over





3 The table shows data for some elite tennis players.

player	A	B	C	D
percentage of first serve points won	79	75	77	77
percentage of second serve points won	60	46	59	50
percentage of service games held	90.8	82.0	97.0	89.7
fastest serve speed/metres per second	57.8	58.6	58.3	60.6
average serve speed/metres per second	53.5	53.7	53.6	55.4
break points saved	17 out of 25	36 out of 54	26 out of 28	24 out of 35

(a) Calculate the percentage of break points saved by player A.

percentage of break points saved = ...% [1]

(b) Calculate the mean of the fastest serve speeds for the players in the table.

Show your working. Give your answer to one decimal place.

mean = ... metres per second [2]



- (c) Calculate the momentum of the ball from player **C**'s fastest serve if the tennis ball has a mass of 0.058 kilograms.

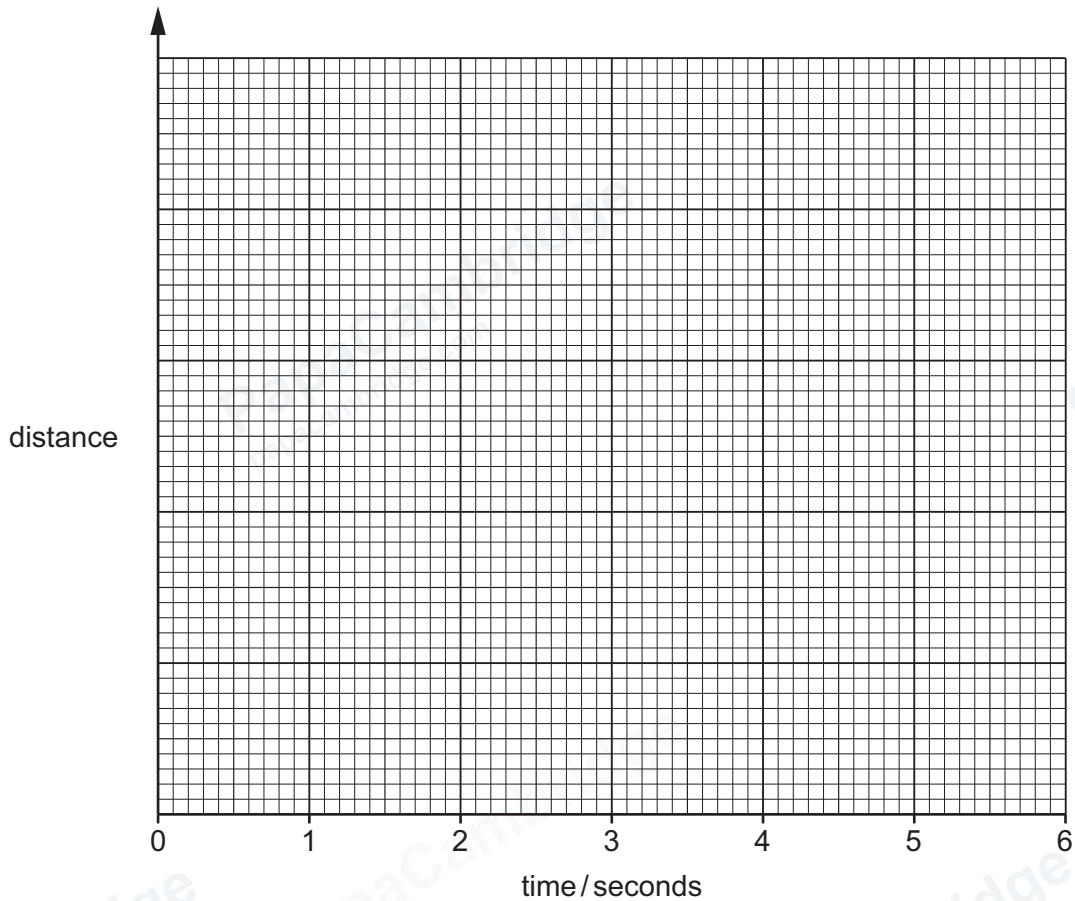
Show your working. Give your answer to one decimal place and include appropriate units.

momentum = ... [3]

- 4 Use the axes to sketch a simplified distance–time graph to show the linear motion of an object that moves in one direction.

The graph must show:

- the object at rest between 0 and 2 seconds
- the object with positive acceleration between 2 and 4 seconds
- the object with negative acceleration between 4 and 6 seconds.



[3]

- 5 Describe the role of the autonomic nervous system in regulating heart rate during exercise of changing intensities.

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[4]



6 Describe the following types of transfer of learning:

positive

.....

bilateral

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[2]





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