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Sports, exercise and health science
Standard level
Paper 2

Tuesday 5 November 2019 (afternoon)

1 hour 15 minutes

Candidate session number

Instructions to candidates

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer one question.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[50 marks]**.

14 pages

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Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

1. A study investigated the effect of practice on the improvement of four field hockey skills. Participants engaged in pre-test and post-test competitions before and after a six-week training programme. During the training programme, participants were randomly allocated to one of three practice groups:

- fixed
- variable
- game-based.

Results for the successful performance of each skill during the competitions are shown in the table.

Field hockey skill	**Practice group**	**Pre-test**		**Post-test**	
		Mean (%)	**± SD**	**Mean (%)**	**± SD**
Trapping	Fixed	67.02	13.59	74.68	12.97
	Variable	63.66	7.70	79.14*	3.96
	Game-based	65.23	9.82	82.73*	7.11
Passing	Fixed	67.95	15.98	69.47	8.25
	Variable	64.58	10.91	67.20	9.84
	Game-based	65.73	15.25	72.27*	5.89
Shooting	Fixed	65.00	31.83	69.45	18.76
	Variable	50.00	36.06	46.02	21.00
	Game-based	79.17	33.23	52.20	31.42
Dribbling	Fixed	92.23	10.02	88.98	7.44
	Variable	98.00	4.47	93.22	4.19
	Game-based	86.48	14.37	91.80	4.42

* $p < 0.05$

(a) (i) State the mean percentage for successful passing by the fixed practice group in the pre-test competition. [1]

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(This question continues on the following page)

(Question 1 continued)

(ii) Identify the practice group and skill with the highest mean percentage of successful post-test performances. [1]

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(iii) Calculate the difference in mean percentage between successful pre-test and post-test game-based trapping. [2]

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(b) Using the data, deduce the effect of each practice group on each skill. [4]

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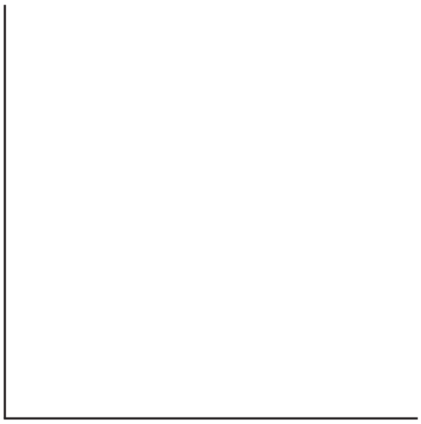
(Question 1 continued)

(c) Outline fixed practice. [2]

(d) (i) Describe the type of transfer used by the game-based practice group during post-test competition. [2]

(ii) Define performance. [1]

(e) (i) Draw a positive acceleration learning curve. [1]



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(Question 1 continued)

(ii) Explain how physical maturation and motivation can affect the rate of learning. [3]

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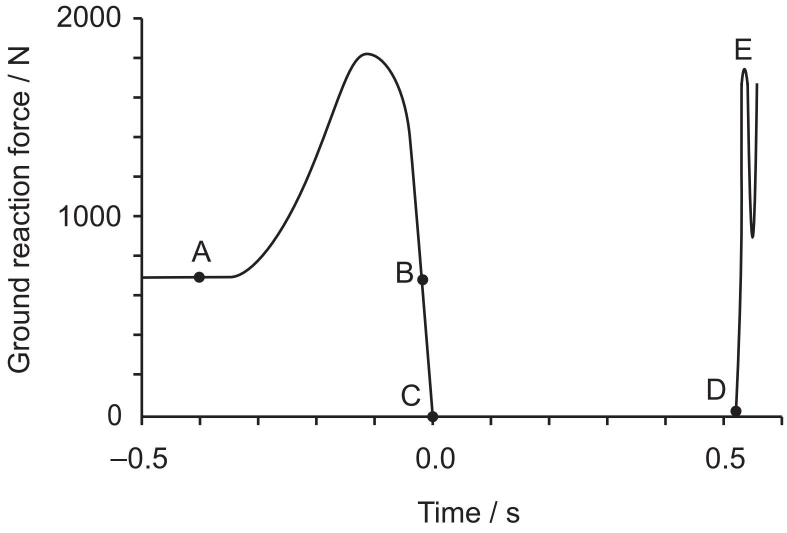
2. An athlete performs a vertical jump on a force plate. The graph shows the recorded ground reaction force of the athlete.



[Source: adapted from *American Journal of Physics* **69**, 1198 (2001), with the permission of the American Association of Physics Teachers]

(a) State what happens to the athlete between C and D. [1]

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(This question continues on the following page)

(Question 2 continued)

(b) Outline power, a performance-related component of fitness. [1]

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(c) Evaluate the vertical jump test as a method of assessing power in volleyball players. [4]

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3. (a) Distinguish the movement permitted between a fibrous and a cartilaginous joint. [1]

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(b) The articular capsule, meniscus and ligaments provide stability at the knee.
Outline **two** other features of a synovial joint. [2]

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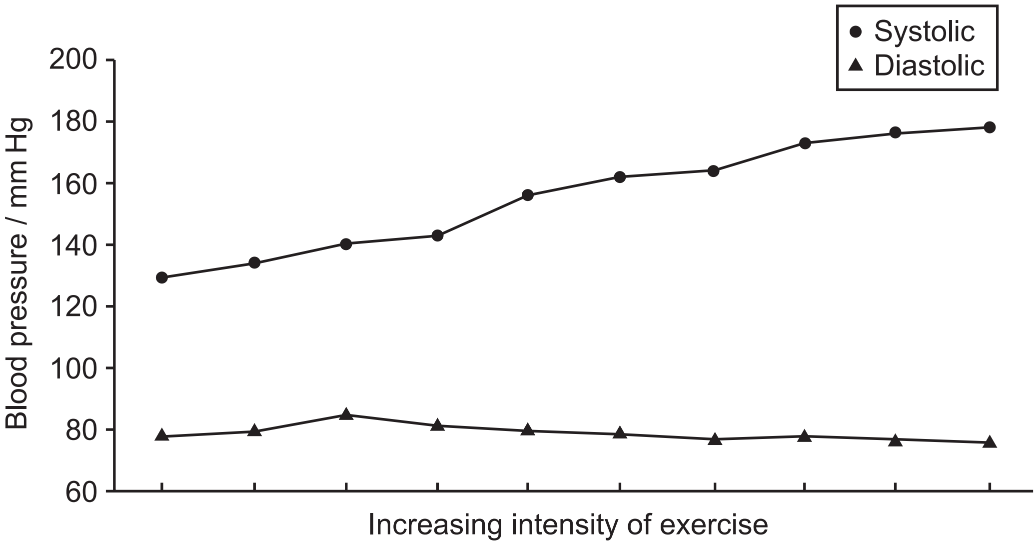
(Question 3 continued)

(c) Using an example, outline an agonist. [1]

4. Explain the cause of the blood pressure response shown in the graph. [3]



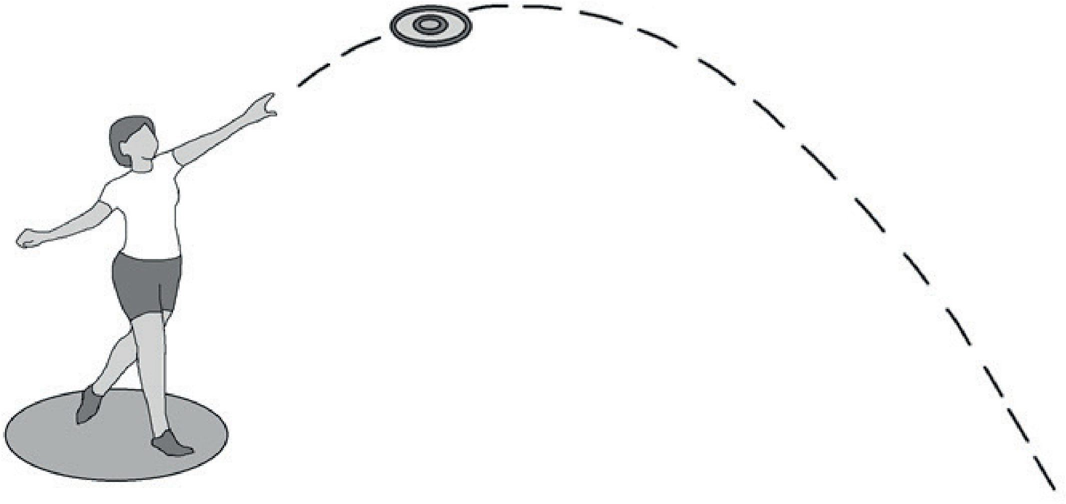
[Source: adapted, with permission, from G. Haff and C. Dumke, *Laboratory Manual for Exercise Physiology*, 1st edition, © 2012 Human Kinetics, Inc.]

Section B

Answer **one** question. Answers must be written within the answer boxes provided.

5. (a) Describe the endurance element of a general training programme. [4]

(b) The diagram shows an athlete throwing a discus.



Outline how Bernoulli’s principle acts on the discus whilst in flight. [6]

(c) Explain the reason for elevated breathing in the first minutes after a swimming sprint. [5]

(d) Analyse the long-term effect of training on maximal oxygen consumption. [5]

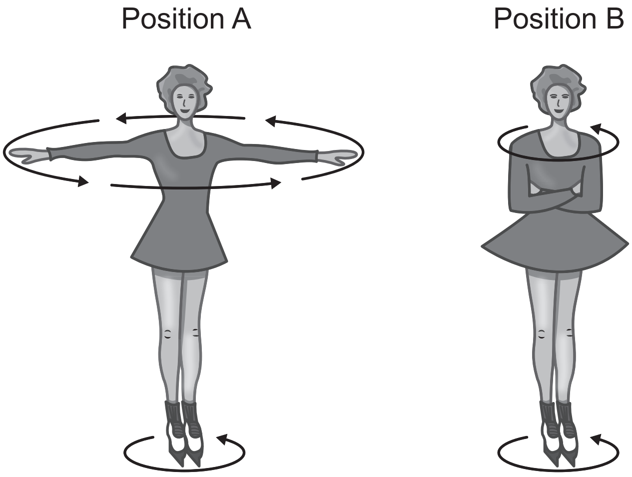
6. (a) Using an example from sport, apply the concept of psychological refractory period. [5]

(b) Compare and contrast the structure of fast-twitch (type IIa and IIb) muscle fibres. [4]

(c) Describe how breathing is controlled during exercise. [5]

(d) Explain how the mechanics of exhalation change from rest to exercise. [6]

7. The diagram shows a figure skater spinning on ice.



[Source: © David Darling, http://www.daviddarling.info/encyclopedia/A/angular_momentum.html]

(a) Explain the concept of angular momentum when a figure skater spins on ice. [6]

(b) Analyse the movement taking place at the figure skater's shoulder when moving from Position A to Position B. [4]

(c) Outline the process of glycogenolysis. [5]

(d) Outline the characteristics of muscle. [5]