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Sports, exercise and health science
Higher level
Paper 2

Tuesday 5 November 2019 (afternoon)

Candidate session number

2 hours 15 minutes

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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 two questions.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[90 marks]**.



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

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(This question continues on the following page)



20EP02

(Question 1 continued)

(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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(c) Using the statistical data, comment on the performance of trapping by the variable practice and game-based practice groups. [1]

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20EP03

Turn over

(Question 1 continued)

(d) Outline fixed practice.

[2]

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(e) Describe the type of transfer used by the game-based practice group during post-test competition.

[2]

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(f) Explain how physical maturation and motivation can affect the rate of learning.

[3]

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2. (a) (i) Outline **two** reasons for using notational analysis in sport. [2]

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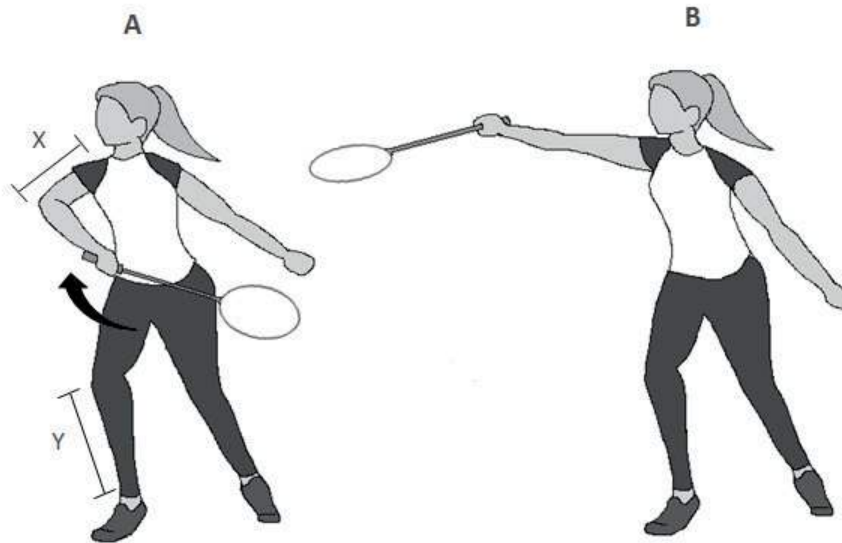
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(ii) A team is in possession of the ball during an invasion game. Sketch a flow chart that can be used for notational analysis. [3]

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3. The diagram shows performance of a backhand lob in badminton.



(a) (i) State the names of the muscles at X and Y. [2]

X:

Y:

(ii) Identify the movement at the elbow joint during the upward phase from position A to position B in the diagram. [1]

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(iii) Outline the type of muscle contraction of the agonist at the elbow joint during the upward phase from position A to position B in the diagram. [1]

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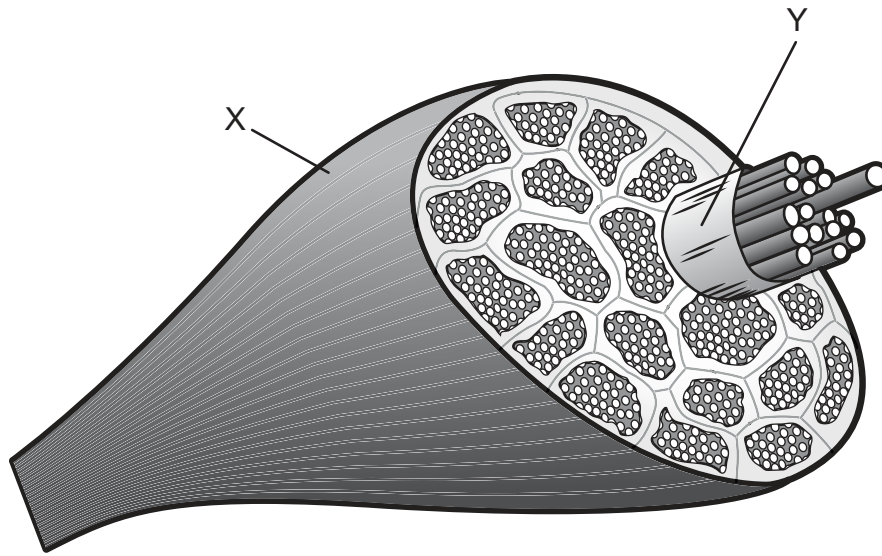
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(Question 3 continued)

(b) The diagram shows a skeletal muscle.



[Source: adapted from sportsinjuryclinic.net]

(i) Identify the structures X and Y in the diagram. [2]

X:
Y:

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

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20EP07

Turn over

(Question 3 continued)

(c) (i) Distinguish between genotype and phenotype. [1]

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(ii) Suggest how genetic and environmental factors may affect muscle fibre type expression. [2]

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(d) Explain the physiological causes of peripheral fatigue in endurance activities. [3]

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(e) Describe delayed onset muscle soreness. [2]

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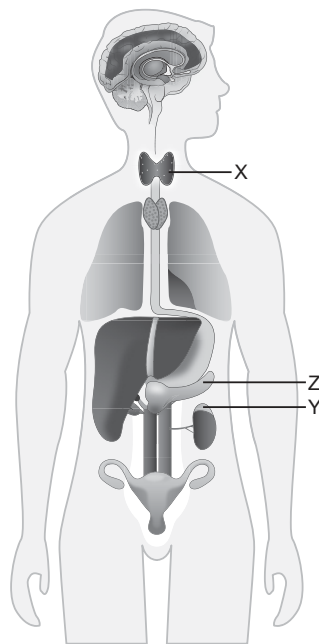
4. (a) (i) State the function of the immune system. [1]

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(ii) Using an example, outline the function of platelets in sport. [2]

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(b) (i) Identify glands X, Y and Z in the diagram. [3]



[Source: by ttsz/iStock Photos]

X:

Y:

Z:

(This question continues on the following page)



20EP09

Turn over

(Question 4 continued)

(ii) Explain adrenaline regulation immediately prior to a sprint race. [3]

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(c) Outline the function of adrenaline during fasting. [2]

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20EP10

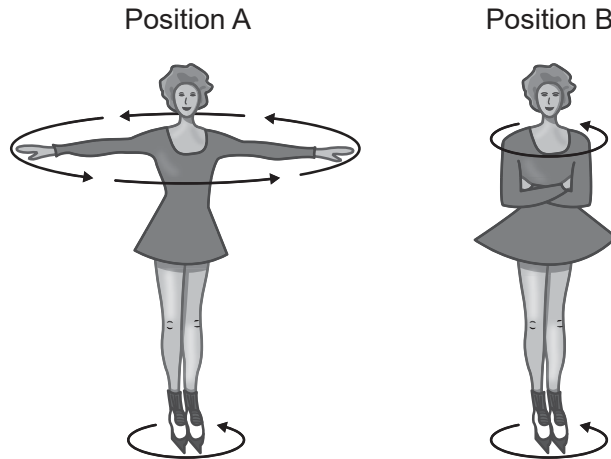
Section B

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

5. (a) (i) Distinguish between health-related and performance-related fitness. [1]
(ii) Apply **two** health-related components of fitness to a marathon runner. [2]
- (b) Describe the exchange of carbon dioxide from the bloodstream during exercise. [4]
- (c) Explain the reason for elevated breathing in the first minutes after a swimming sprint. [5]
- (d) (i) Outline **two** types of drag that can occur in swimming. [4]
(ii) Suggest how a triathlete (swimming, cycling, running) can overcome drag. [4]
6. (a) (i) Identify **one** effect on the immune system of training for a marathon. [1]
(ii) Outline strategies a marathon runner could use to reduce the risk of infection. [3]
- (b) (i) Describe the extrinsic regulation of the sinoatrial (SA) node as an athlete begins a warm-up. [3]
(ii) Describe **two** functions of the skin. [4]
- (c) Suggest how an aerobic 1500 m endurance athlete uses the principles of overload. [4]
- (d) Evaluate the multistage fitness test as a method of assessing aerobic capacity in a long-distance runner. [5]



- 7. (a) (i) Using anatomical terminology, state the location of the cerebellum in relation to the cerebrum. [1]
- (ii) Describe the role of the cerebellum during the performance of a dance routine. [3]
- (b) The diagram shows a figure skater spinning on ice.



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

- Explain the concept of angular momentum when a figure skater spins on ice. [6]
- (c) Outline the components associated with sensory input that can be used by the figure skater when performing a routine. [4]
 - (d) (i) Identify **two** characteristics of a novice figure skater. [2]
 - (ii) Using examples, explain how a coach can use task and environment constraints to increase motivation in novice performers. [4]
8. (a) (i) Outline catabolism. [1]
- (ii) Describe the aerobic production of ATP before electrons are passed into the electron transport chain. [6]
- (b) Describe the replacement of glycogen stores during recovery from fatigue after a long-distance swim. [4]
- (c) Analyse the long-term effect of training on maximal oxygen consumption. [5]
- (d) Evaluate the implications of genetic screening in sport. [4]



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20EP13

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20EP14

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20EP15

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20EP16

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20EP17

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20EP18

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20EP19

Please **do not** write on this page.

Answers written on this page
will not be marked.



20EP20