Government of **Western Australia**
School Curriculum and Standards Authority

WACE
Western Australian Certificate of Education

Western Australian Certificate of Education Examination, 2015

Question/Answer Booklet

PHYSICAL EDUCATION STUDIES

Stage 3

Please place your student identification label in this box

Student Number: In figures | | | | | | | | |

In words _____

_____

Time allowed for this paper

Reading time before commencing work: ten minutes
Working time for paper: two and a half hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer Booklet
Multiple-choice Answer Sheet

Number of additional answer booklets used (if applicable): ☐

To be provided by the candidate

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special Items: non-programmable calculators approved for use in the WACE examinations

Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

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Web version of 2015/96268

Ref: 15-109

Structure of the examination

The WACE Physical Education Studies Stage 3 examination consists of a written component worth 70 per cent of the total examination score and a practical (performance) component worth 30 per cent of the total examination score.

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of total exam
Section One: Multiple-choice	15	15	30	15	14
Section Two: Short answer	10	10	70	70	35
Section Three: Extended answer	4	2	50	30	21
				Total	70

Instructions to candidates

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2015*. Sitting this examination implies that you agree to abide by these rules.

2. Answer the questions according to the following instructions.

   Section One: Answer **all** questions on the separate Multiple-choice Answer Sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

   Sections Two and Three: Write your answers in this Question/Answer Booklet.

3. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.

4. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.
   - Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
   - Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

See next page

Section One: Multiple-choice **14% (15 Marks)**

This section has **15** questions. Answer **all** questions on the separate Multiple-choice Answer Sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Suggested working time: 30 minutes.

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1. The muscle fascicle contains

   (a) muscle fibres surrounded by the epimysium.
   (b) the muscle tendon.
   (c) muscle fibres surrounded by the perimysium.
   (d) muscle fibres surrounded by the myofibril.

2. Which of the following statements is correct for the sliding filament theory of muscle contraction?

   (a) The myosin filaments are shortened.
   (b) The actin filaments are shortened.
   (c) Both the actin and myosin filaments change length as the muscle contracts.
   (d) Neither the actin or myosin filaments change length as the muscle contracts.

3. Psyching up through self-talk is a mental skills strategy that can be used by athletes who could be experiencing

   (a) under-arousal.
   (b) over-arousal.
   (c) optimal arousal.
   (d) positive arousal.

4. Which of the following physiological effects will a person experience on their arrival at a high-altitude training camp?

   (a) decrease in tidal volume
   (b) decrease in heart rate
   (c) increase in stroke volume
   (d) increase in blood pressure

See next page

5. The 2014 New York City marathon was run on a windy, drizzly, overcast day on which the temperature peaked at six degrees Celsius. Which of the following statements is **true** in relation to performing in this cold environment?

   (a) Although heat loss occurs from the hands and head, hyperthermia is unlikely as the area of the hands and head is relatively small compared with active leg muscles.
   (b) Warming up in cold environments is important because vasoconstriction occurs in both the skin and the resting skeletal muscle and cooled muscle has reduced capacity to generate force.
   (c) A cooled muscle will produce maximal force production therefore runners should refrain from warming up prior to the marathon.
   (d) During steady-state exercise in very cold environments it is not necessary to hydrate, as sweating will be minimal.

6. The part of the motor neuron that receives nerve impulses from other neurons is the

   (a) cell body.
   (b) axon.
   (c) synapse.
   (d) dendrite.

7. Which of the following physiological responses occur in athletes after a one-month training program undertaken at altitude?

   (a) increased core temperature and reduced skin vasodilation
   (b) decreased blood volume and increased blood pressure
   (c) increased haemoglobin and red blood cell count
   (d) decreased blood viscosity and reduced hypoventilation during performance

8. Which option **best** completes the following statement?

   When a player is a member of a group their individual effort and motivation at training is

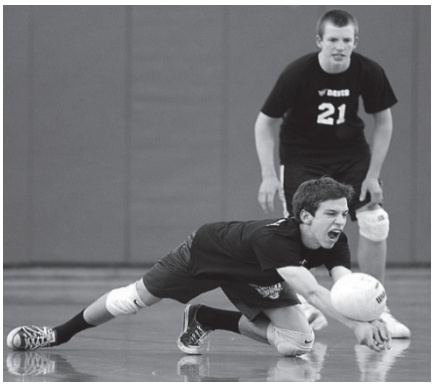
   (a) increased when they are able to choose what outfits they will wear to training sessions compared to a training uniform.
   (b) increased at those training sessions where the players of several squads are combined compared to training sessions with a smaller number of squads.
   (c) reduced when they participate in small-group training activities as opposed to large-group training activities.
   (d) reduced when the squad size is large and training activities are designed for larger as opposed to smaller groups.

See next page

9. Which of the following strategies would be **best** for an athlete who is struggling to maintain their motivation across the four-year Olympic cycle?

(a) listen to relaxing music pre-performance to improve ability to focus at key competition events
(b) break down annual performance goals into a series of sub-goals to achieve across competition events
(c) develop a number of interesting pre-performance routines to use at a number of key competition events
(d) rehearse in their imagination the feelings of representing their country before each competition event

10. A volleyball dig is the key skill for intercepting the serve or the spike, with the most complex versions being to dive with one or two hands to intercept a wide ball.



For a developmental squad of young volleyball players which of the following drills **best** develops skill complexity?

(a) Drill requires three players to dig the ball to each other in turn in a set triangle pattern as many times as possible without moving from the spot.
(b) Drill requires player to practise the two hand dig action against a wall target 5, 10 and 20 times.
(c) Drill requires player to repeatedly dig the ball up to themselves without losing control for 5, 10 and 20 consecutive hits.
(d) Drill requires player to dig ball thrown at them; to dig balls thrown to left and then right consecutively; to dig fast balls thrown randomly to their left and right.

11. The size of a motor unit is dependent upon the

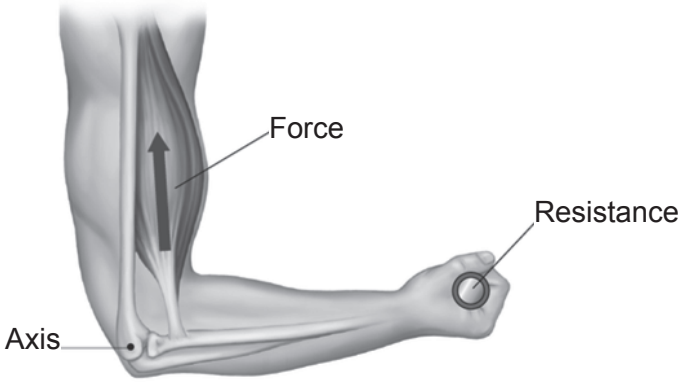
(a) number of muscle fibres it innervates.
(b) number of motor neurons it contains.
(c) length of the muscle fibres it innervates.
(d) cross-sectional area of the muscle fibres it innervates.

See next page

12. Coach feedback is one key source of learning information for an athlete. Which of the following is the **most** effective performance information for an individual athlete?

(a) The coach observes that his players are losing focus and calls a time out. 'Ignore the crowd. They are trying to put you off your game – zone them out.'
(b) The coach states at the break 'Well done Sam, superb effort! We have him on the ropes. Keep going.'
(c) The coach states 'Fantastic! Your left arm was in the exact position to make that shot. Try to repeat it on this next attempt.'
(d) The athlete makes a simple ball handling error due to overconfidence that causes a crucial goal to the opposition. The coach shouts, 'That was stupid! You call yourself a good athlete?'

13. The following diagram **best** represents which class of lever?



(a) 1st class lever
(b) 2nd class lever
(c) 3rd class lever
(d) 4th class lever

Use the information in the table to answer Question 14.

	Table tennis ball	**Cricket ball**	**Tennis ball**	**Golf ball**
Coefficient of restitution	0.94	0.43	0.84	0.74

14. The order in which the balls will bounce when dropped from a height of 1.2 metres onto the same surface arranged from highest to lowest is

(a) table tennis ball, cricket ball, tennis ball, golf ball.
(b) table tennis ball, tennis ball, golf ball, cricket ball.
(c) cricket ball, golf ball, tennis ball, table tennis ball.
(d) cricket ball, tennis ball, table tennis ball, golf ball.

15. A cricket fast bowler has to generate a great deal of ball velocity by using expert timing within their technique. This is **mostly** an application of which biomechanical principle?

(a) segmental interaction
(b) optimal projection
(c) balance
(d) spin

End of Section One
See next page

Section Two: Short answer **35% (70 Marks)**

This section has **10** questions. Answer **all** questions. Write your answers in the spaces provided in this Question/Answer Booklet. Wherever possible, confine your answers to the lines provided. Use a blue or black pen (**not** pencil) for this section.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 70 minutes.

Question 16 **(8 marks)**

(a) The coaching team of the Perth Glory soccer squad is responsible for planning and organising the training program for the entire team. They use the concept of periodisation and design the annual training program with specific phases aimed at getting the best possible performance from the team. Identify the **three** phases the coaches would incorporate into the annual training program of the Perth Glory and outline the objective of each phase. (6 marks)

See next page

Question 16 (continued)

(b) A soccer team consists of players who perform different roles in the team. Two examples are the goalkeeper and central midfielder.

- The goalkeeper has the role of saving goals and clearing the ball (kicking or throwing the ball far from the goal area).
- A midfielder plays both offensive and defensive roles; many times during a game they are running from their own goal area to the opposition's.

Understanding the goalkeeper and midfielder requirements during the game, justify the difference in glycogen depletion you would expect for each player following the game.

(2 marks)

Question 17 **(7 marks)**

The table below indicates the recommended racquet sizes for junior tennis players through to adult players.

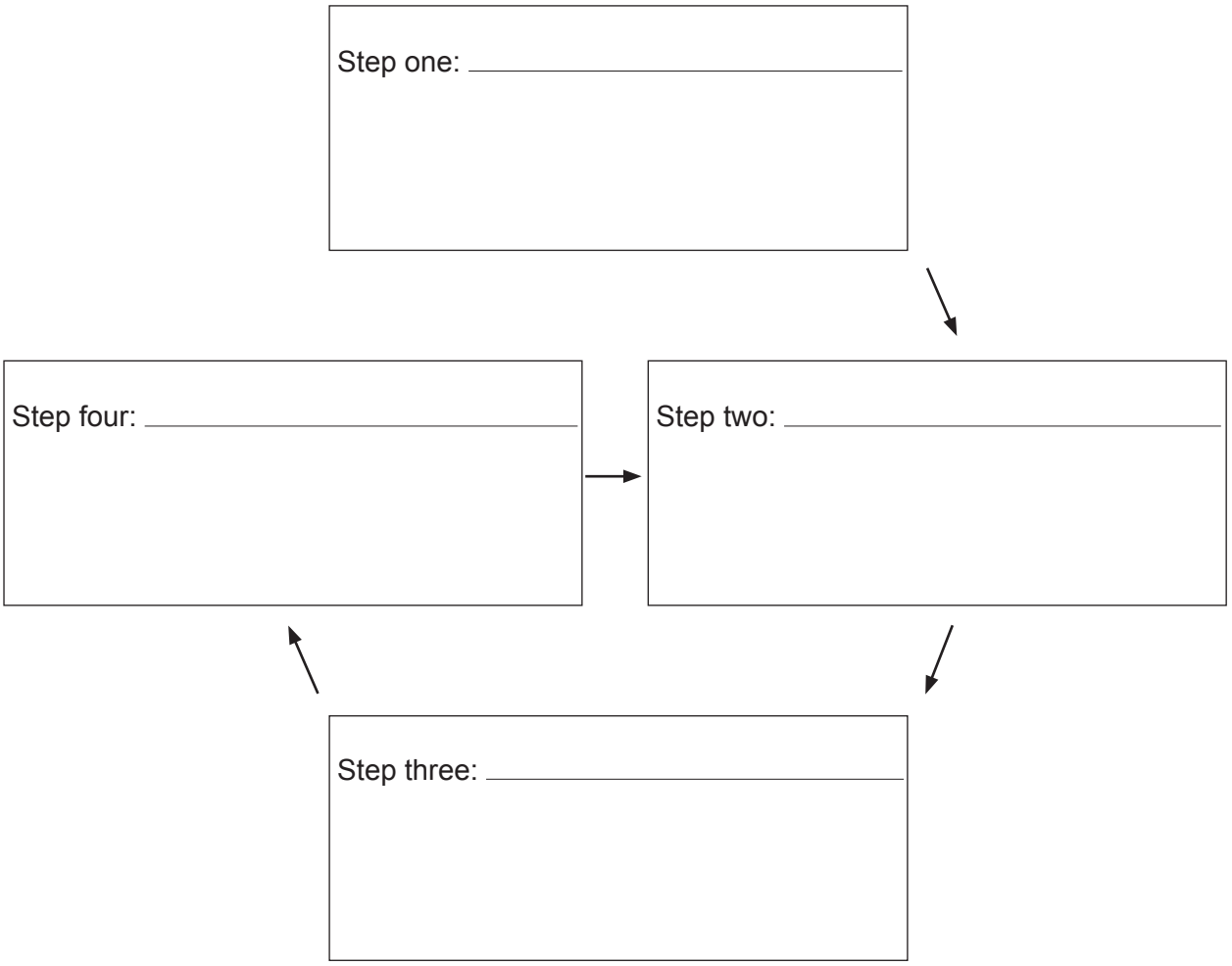
Age	Height	Racquet length
4–6	105–118 cm	53.3 cm
7–8	118–135 cm	58.4 cm
9–12	135–150 cm	63.5–66 cm
Adult	> 150 cm	68.6–71.1 cm

(a) Explain the biomechanical reason why the racquets used by junior players are shorter than those used by adults and explain the implication for junior players' performance.

(3 marks)

See next page

(b) Below is a blank skill analysis model a tennis coach could use to identify and correct the errors in their player's serve. Complete the diagram by describing what happens at each stage of the process. (4 marks)



Question 18 **(9 marks)**

For four days at the 2014 Australian Tennis Open in Melbourne, the temperature climbed over 40 degrees Celsius, forcing organisers to enact their 'Extreme Heat Policy' and halt play on the outside courts as temperatures topped 43 degrees.

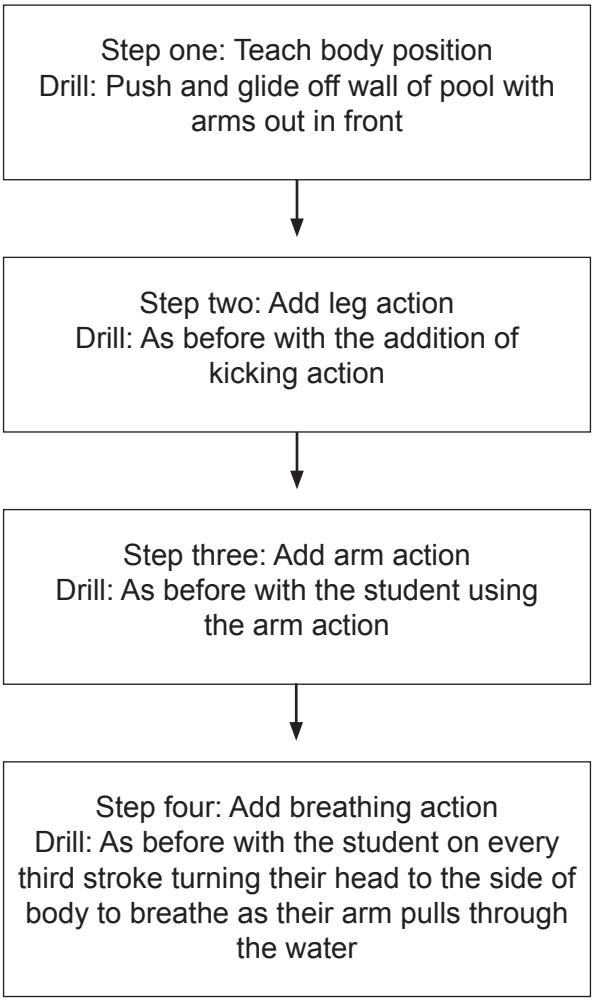
(a) Identify **five** physiological changes the players would have experienced playing in these very hot conditions. (5 marks)

(b) Identify and justify **two** strategies the players could have employed to aid them in performing under these conditions. (4 marks)

See next page

Question 19 **(6 marks)**

Jane is a swimming teacher who uses the following steps to teach freestyle to beginning swimmers.



(a) Identify what coaching activity Jane is using to teach her students freestyle and provide evidence for your answer. (2 marks)

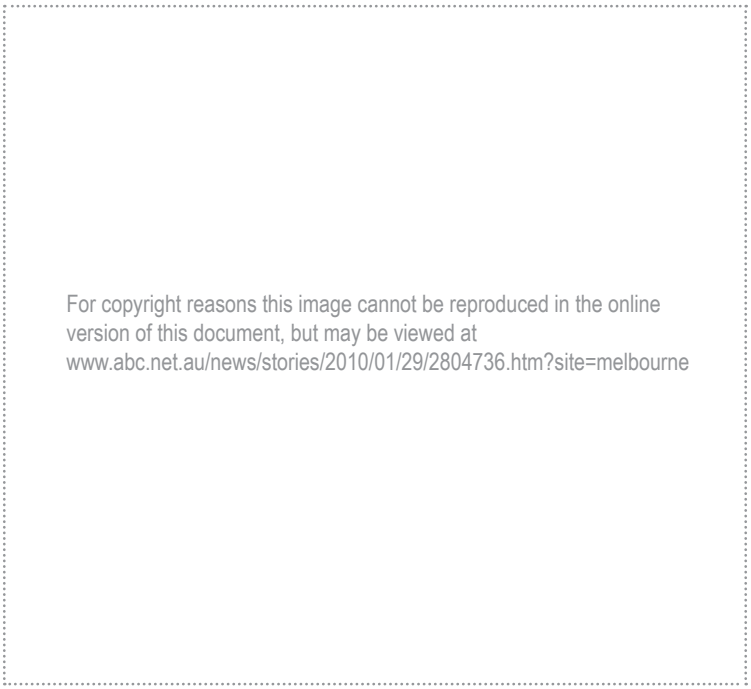
See next page

Question 19 (continued)

(b) Name and describe the characteristics of **two** other coaching activities Jane could use to teach her students freestyle swimming. (4 marks)

See next page

Question 20 **(9 marks)**



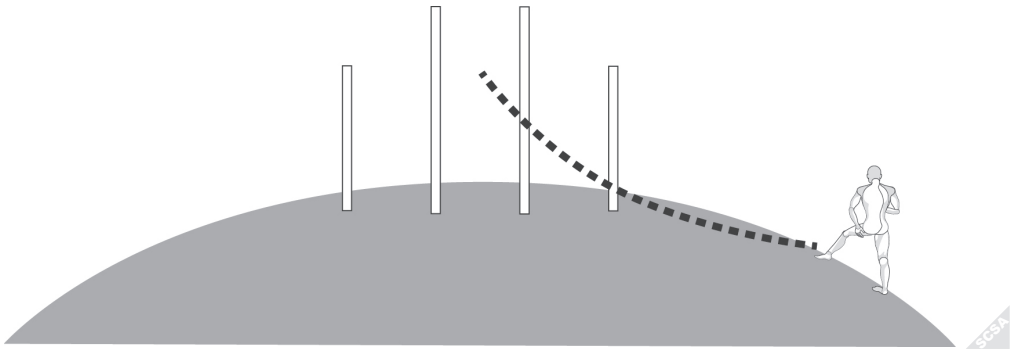
Matthew Lloyd is a retired Australian Rules Football player who won the Coleman Medal (the award for most goals in a season for the Australian Football League) three times. No matter where his match was being played, before every set shot for goal, he would throw some grass in the air.

(a) What is the term used in sport psychology to describe this action? (1 mark)

(b) Explain **two** benefits of Matthew performing this action. (2 marks)

Question 20 (continued)

Many times during Matthew's career he had to kick goals from the boundary line. In doing this, he kicked the ball to make it curve around the goalpost to score.



(c) Explain the biomechanical principle which makes the ball curve in the air. Include a fully labelled diagram in your answer. (6 marks)

See next page

Question 21 **(7 marks)**

Jamie has begun a resistance training routine and has been given advice about supplementation. To improve his results from training, he has begun taking protein powder within the recommended ranges for daily protein ingestion.

(a) Name another performance-enhancing substance that has similar but more substantial physiological changes to protein powder, but significant negative side effects. (1 mark)

(b) Describe **three** potential physiological changes that may occur as a result of appropriate ingestion of protein powder. (3 marks)

(c) Many energy and cola drinks contain a legal stimulant. Identify the stimulant and describe **two** physiological changes that occur with ingestion of this stimulant that would explain why the coach of a pistol shooter has advised the athlete to avoid consuming these drinks prior to training or competition. (3 marks)

See next page

Question 22 **(9 marks)**

(a) An effective coach will adapt their leadership style to suit different team circumstances. Identify **three** different leadership styles. (3 marks)

(b) Give **two** appropriate situations for each leadership style identified in part (a). (6 marks)

See next page

Question 23 **(4 marks)**

An athlete's performance can be either enhanced or reduced by applying mental skills strategies. Identify what mental skill is being applied and the effect on performance for parts (a) and (b) below.

(a) Before the semi-final of the Australian Open tennis tournament, 19-year-old Australian player Nick Kyrgios entered the arena wearing headphones. He was nervous and anxious at facing former titleholder, Andy Murray. (2 marks)

For copyright reasons this image cannot be reproduced in the online version of this document, but may be viewed at www.smh.com.au/sport/tennis/nick-kyrgios-always-marched-tothe-beat-of-his-own-drum-20150127-12zb53.html

(b) During his game against Nick Kyrgios, Andy Murray was often seen pumping his fists shouting 'Yeah, c'mon, c'mon' after hitting a winning shot. (2 marks)

For copyright reasons this image cannot be reproduced in the online version of this document, but may be viewed at www.standard.co.uk/sport/tennis/australian-open-2015-andy-murraywary-of-tomas-berdych-threat-as-he-bids-to-book-his-place-in-final-10008235.html

See next page

Question 24 **(5 marks)**

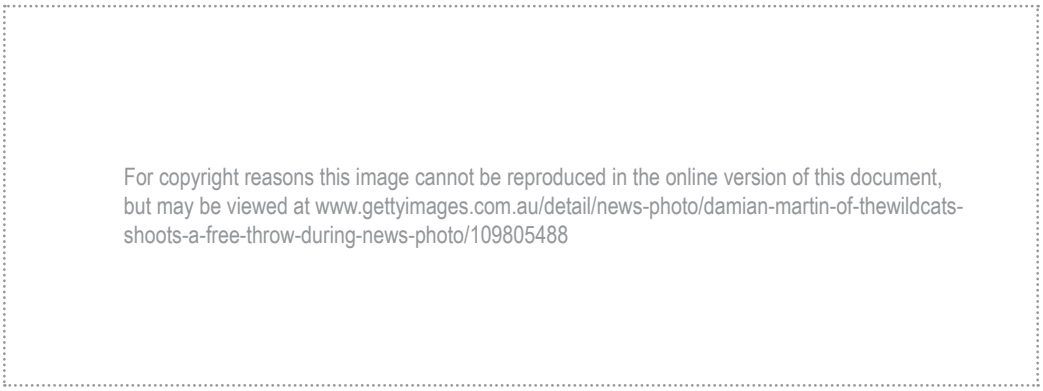
In February 2015, Western Australian Nina Kennedy broke the world junior outdoor pole vault record with a height of 4.59 m.

(a) Identify **three** different methods that can be used for learning and skill development that Nina and her coach may have implemented to correct and improve her jumping technique. (3 marks)

(b) Identify **one** method that would be most beneficial for use during her training sessions and justify your choice. (2 marks)

See next page

Question 25 **(6 marks)**



(a) The position of Damian Martin's elbow shown in the image above is considered to result in an optimal muscle length. Explain the force-length relationship of muscle contraction with respect to a very flexed, middle (as above) and very extended elbow joint. (3 marks)

(b) Explain the force-velocity relationship when different magnitudes of force are required from muscle contraction. (3 marks)

End of Section Two

See next page

Section Three: Extended answer **21% (30 Marks)**

This section contains **four (4)** questions. You must answer **two (2)** questions. Write your answers in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 50 minutes.

Question 26 **(15 marks)**

Caitlin Bassett plays netball for West Coast Fever and has represented Australia in the position of goal shooter. She is commonly seen shooting for goal with an arm position identified by the circle in the image above to create the torque on the ball necessary to score the goal.

(a) Describe the factors that influence how much torque is produced during her shot and then describe which type of lever system is used. Following the production of torque and the release of the ball, describe the aspects of projectile motion that would influence whether her shot was successful or not. (9 marks)

See next page

See next page

Question 26 (continued)

(b) The sport of netball requires athletes to jump explosively and sprint and repeat this for over an hour of game time. The athletes therefore play an intermittent type of game. Given such contrasting demands, name and justify the muscle fibre type that may be most beneficial for these athletes and describe **three** characteristics of this fibre type.

(6 marks)

See next page

Question 27 **(15 marks)**

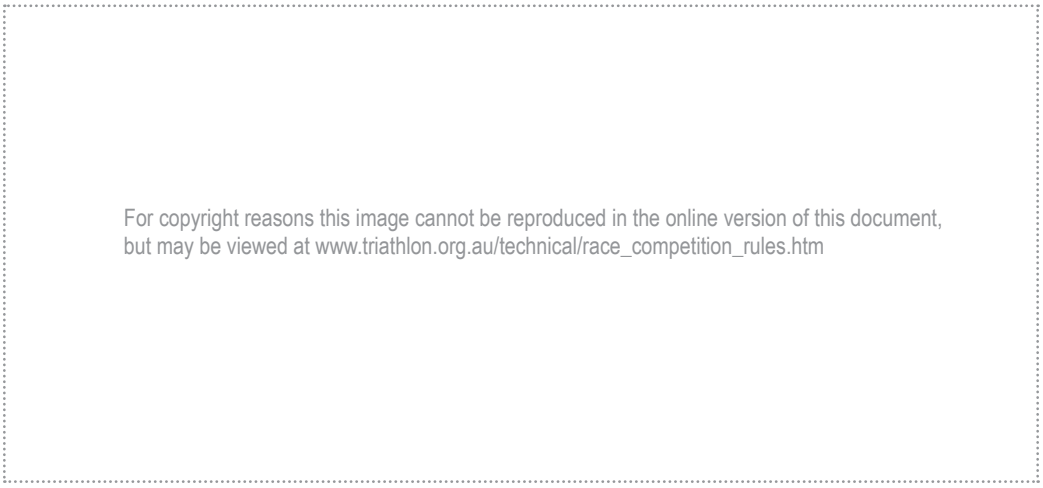
Triathlon combines swimming, cycling, and running in one event. The Olympic, or standard distance in triathlon is a 1500 metre swim, 40 kilometre bike ride, and a 10 kilometre run, with elite competitors finishing in under two hours.

(a) Discuss the nutritional considerations that triathletes should consider pre-, during and post-competition for an Olympic distance event. (6 marks)

See next page

Question 27 (continued)

For some races the cycling component of a triathlon has rules related to how close athletes can cycle to each other. This is called drafting, as shown in the diagrams below.



Cyclist A and cyclist B are maintaining adequate separation. Cyclist C is not attempting to pass cyclist B. Cyclist C is drafting cyclist B. Cyclist A and cyclist B are not drafting.

(b) Use your knowledge of biomechanics to discuss the principle behind this rule and explain why this rule is necessary. (9 marks)

See next page

Question 28 **(15 marks)**

Figure 1

Figure 2

Figure 3

Figure 4

At the 2012 London Olympics, Jessica Ennis won the gold medal for the heptathlon event, which involves seven disciplines in running, throwing and jumping over two days of competition. Figures 1, 2, 3 and 4 show Jessica performing in four events – the 200 metres, long jump, shot put and javelin.

(a) Discuss the categories of transfer of learning Jessica may experience as a heptathlete and, using the events in the photos above, identify and explain **three** different potential effects of transfer of learning. (9 marks)

See next page

See next page

Question 28 (continued)

(b) State and justify which energy system is predominant for Jessica during the 800 m that she completes in a time of two minutes, and the high jump, in which each jump takes her about eight seconds. Explain the most beneficial recovery method for use after each of these events. (6 marks)

See next page

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See next page

Question 29 **(15 marks)**

Steve is a track athlete who runs middle-distance events and has decided to compete in the 12 km Perth City to Surf race. His goal is to be fully fit to compete in this race and he has designed the following training program to ensure this happens.

Week	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total distance
1	Off	Fartlek (8 km)	8 km	9 km	9 km	6 km	11 km	51 km
2	Off	6 x 800 m (10 km pace)	8 km	9 km	Fartlek (8 km)	6 km	16 km	52 km
3	Off	6 x 800 m (10 km pace)	8 km	9 km	6 hills (10 km pace)	6 km	14 km	43 km
4	Off	8 x 400 m (5 km pace)	8 km	11 km	8 km	6 km	20 km	56 km
5	Off	6 x 800m (10 km pace)	9 km	11 km	5 long hills (10 km pace)	6 km	16 km	49 km
6	Off	10 x 400 m (5 km pace)	9 km	11 km	9 km	6 km	22 km	61 km
7	Off	8 x 800 m (10 km pace)	11 km	13 km	6 long hills (5 km pace)	3 km	10 km	45 km
8	Off	9 km	11 km	9 km	6 x fast 400 m (5 km pace – 15 secs)	6 km	16 km	54 km
9	Off	12 x 400 m (5 km pace)	9 km	11 km	8 hills (10 km pace)	3 km	13 km	43 km
10	Off	11 km	8 km	11 km	8 x 800 m (10 km pace)	6 km	16 km	58 km
11	Off	8 x fast 400 m (5 km pace – 15 secs)	9 km	9 km	8 x 800 m (5 km pace – 15 secs)	6 km	11 km	44 km
12	Off	8 x 400 m (5 km pace)	5 km	8 km	Off	3 km	**RACE DAY**	29 km

Notes on the training program:

- '5 kilometre pace' or '10 kilometre pace' refers to the speed at which Steve could run a 5 kilometre or 10 kilometre race.
- '8 hills,' means Steve does eight repeats on a hill about 150 metres long. For long hills Steve runs about 400 metres.
- '4 x 800 m,' means Steve runs four repeats of 800 metres each. The pace stated below tells him how fast he should run them. For 800 m, Steve gives himself 2 minutes of rest between intervals; for 400 m, he gives himself 1 minute of rest.

See next page

(a) With reference to Steve's training program, explain the principles of overtraining, tapering, macro-cycles, micro-cycles and recovery. (10 marks)

See next page

Question 29 (continued)

(b) Steve's coach is the head coach for Western Australia's athletics team and is worried about how to build group cohesion ahead of the national championships with a team made up of athletes from all over the State. Assist the coach by identifying from Carron's model the **four** factors that affect the development of cohesion. Describe **two** of these factors and suggest a strategy that could be applied to these factors. (5 marks)

End of questions

Additional working space

Question number: _____

Additional working space

Question number: _____

Additional working space

Question number: _____

Additional working space

Question number: _____

Additional working space

Question number: _____

Additional working space

Question number: _____

ACKNOWLEDGEMENTS

Section One

Question 10

Image 1
Neeley, D. (n.d.). *Valencia-vikings-boys-volleyball-dig-800*. Retrieved May, 2015, from http://photography.daveneeley.com/sports/

Image 2
Bellamy, W. (2011, March 16). DHS boys play better volleyball in loss to Sheldon. *Davis Enterprise*. Retrieved May, 2015, from www.davisenterprise.com/sports/dhs-boys-play-better-volleyball-in-loss-to-sheldon/

Question 13

Image: Behnke, R. (2012). *Kinetic anatomy* (3rd ed.). Champaign, IL: Human Kinetics, Fig. 1.23b. www.humankinetics.com/excerpts/excerpts/levers-work-to-create-movement-in-the-human-body

Section Two

Question 20

Image: Getty Images. (2010, January 29). Matthew Lloyd…honoured with life membership. In Australian Associated Press, *Lloyd to become AFL life member*. Retrieved May, 2015, from www.abc.net.au/news/stories/2010/01/29/2804736.htm?site=melbourne

Question 23(a)

Image: Reuters. (2015, January 27). In the zone: Nick Kyrgios and his headphones. In M. Chammas, Nick Kyrgios always marched to the beat of his own drum. *Sydney Morning Herald*. Retrieved May, 2015, from www.smh.com.au/sport/tennis/nick-kyrgios-always-marched-to-the-beat-of-his-own-drum-20150127-12zb53.html

Question 23(b)

Image: Brunskill, C. (2015, January 28). Winning streak. In P. Newman, Australian Open 2015: Andy Murray wary of Tomas Berdych threat as he bids to book his place in final, *London Evening Standard*. Retrieved May, 2015, from www.standard.co.uk/sport/tennis/australian-open-2015-andy-murray-wary-of-tomas-berdych-threat-as-he-bids-to-book-his-place-in-final-10008235.html

Question 24

Image: Kane, P. (2015). *Perth, Australia—February 14: Nina Kennedy of the West Australian Institute of Sport competes in the womens pole vault* […]. Retrieved May, 2015, from www.gettyimages.com.au/detail/news-photo/nina-kennedy-of-the-west-australian-institute-of-sport-news-photo/463423142

Question 25

Image: Kane, P. (2014). *Perth, Australia—April 13: Damian Martin of the Wildcats shoots a free throw* […]. Retrieved May, 2015, from: www.gettyimages.com.au/detail/news-photo/damian-martin-of-the-wildcats-shoots-a-free-throw-during-news-photo/109805488

Section Three

Question 26

Image adapted from: Johnston, H. (2010). Caitlin Bassett of the Fever shoots […]. In *ANZ Championship Rd 4—Magic v Fever (Caitlin Bassett)*. Retrieved May, 2015, from www.zimbio.com/pictures/7rK-t12uX_m/ANZ+Championship+Rd+4+Magic+v+Fever/odWpFpnDjzo/Caitlin+Bassett

Question 27

Image adapted from: Triathlon Australia. (2013). *Race competition rules*. Surry Hills, NSW: Author, p. 9, diagrams 1 & 2. Retrieved May, 2015, from www.triathlon.org.au/technical/race_competition_rules.htm

Question 28

Figure 1
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