



Western Australian Certificate of Education Examination, 2012

Question/Answer Booklet

PHYSICAL EDUCATION STUDIES

Stage 3

Please place your student identification label in this box

Student Number: In figures

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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 tape/fluid, 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.

Structure of the examination

The Physical Education Studies examination comprises a written examination worth 70 per cent of the total examination score and a practical examination 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 exam
Section One: Multiple-Choice	15	15	20	15	10.5
Section Two: Short answer	8	8	70	45	31.5
Section Three: Extended answer	4	2	60	40	28
Total					70

Instructions to candidates

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2012*. 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 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(s) that you are continuing to answer at the top of the page.

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Section One: Multiple-choice

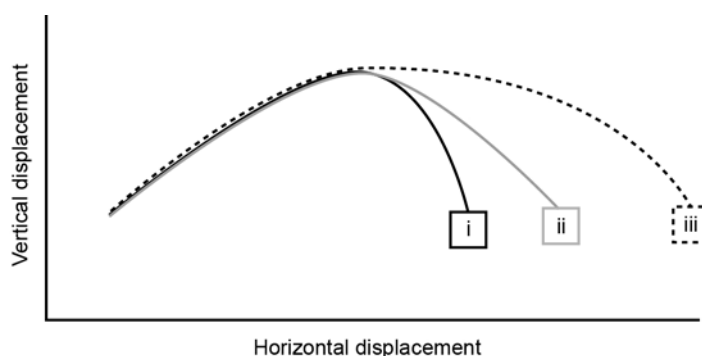
10.5% (15 Marks)

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: 20 minutes.

1. Which hitting technique producing spin on the ball is associated with the ball trajectories shown below?



- (a) (i) back spin, (ii) no spin, (iii) top spin
(b) (i) no spin, (ii) side spin, (iii) top spin
(c) (i) top spin, (ii) side spin, (iii) back spin
(d) (i) top spin, (ii) no spin, (iii) back spin
2. Within the coordination continuum, which of the following examples **best** represents simultaneous movement?
- (a) swimmer diving from starting blocks
(b) playing a forehand drive in tennis
(c) lifting a heavy weight
(d) hockey drive pass
3. Which of the following combination of factors affects the Coefficient of Restitution rating of a rebounding object?
- i. the material of the two interacting surfaces
ii. the size and mass of the rebounding object
iii. the velocity of the colliding bodies
iv. the temperature of the materials involved
- (a) i, ii and iii
(b) i, iii and iv
(c) ii, iii and iv
(d) i, ii and iv

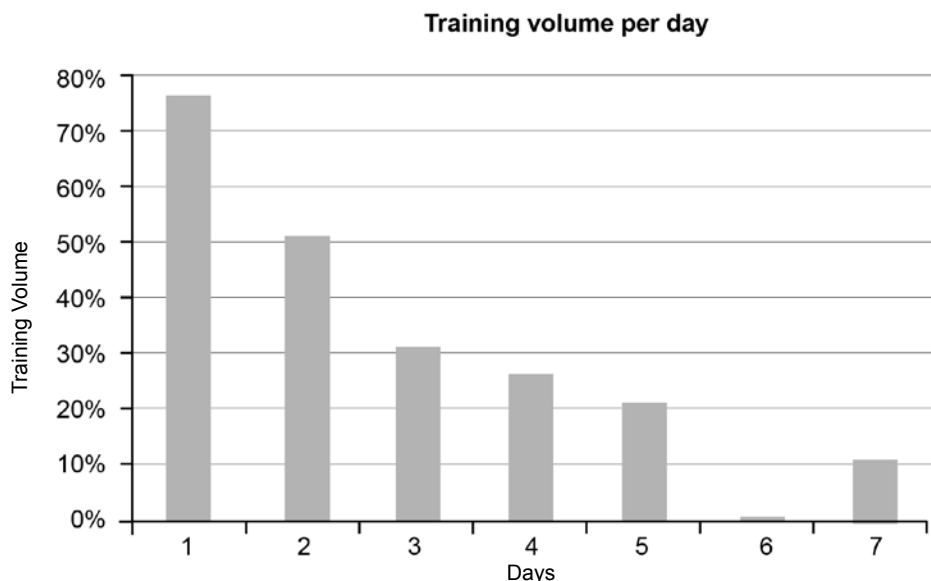
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4. The images below show a boomerang. Which principle is utilised in the design of this throwing object?

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- (a) Bernoulli's principle
(b) Buoyancy principle
(c) Optimum projection principle
(d) Range of motion principle
5. Which of the following dietary considerations would you be **least** likely to recommend to an athlete?
- (a) having a high GI meal four hours before a basketball game (game duration – 2 hours)
(b) having a low GI meal two hours before an ironman event (event duration – 8 hours)
(c) drinking a high GI energy drink directly after a game of AFL football (game duration – 2 hours)
(d) eating a high GI snack immediately before a 100 metre sprint (event duration – 10 seconds)
6. Which of the following statements is correct when relating to an athlete who has to train and compete in extremely hot conditions?
- (a) The athlete's heart rate is likely to be higher than when training and competing in milder conditions.
(b) The athlete should wear compression clothing to help retain fluid in the muscle core.
(c) The athlete should consume salt drinks to reduce sweat loss.
(d) The athlete's performance is likely to be better than in milder conditions.

7. The graph below represents the training volume of an athlete for the seven days before an event.



- The decline in the graph is **best** explained by the athlete
- (a) peaking.
 - (b) tapering.
 - (c) overtraining.
 - (d) being injured.
8. As part of the warm-up for a court-based game such as netball, tennis or basketball, players run through a horizontal ladder. Which transfer of learning effect is being used in this warm-up activity?
- (a) positive
 - (b) non-specific
 - (c) negative
 - (d) zero
9. During a demonstration of the breast stroke arm action, a coach is heard to say to the swimmer 'think of the action as scooping the bowl'. This is an example of which type of coaching activity?
- (a) static-dynamic
 - (b) chaining
 - (c) shaping
 - (d) simple-complex
10. Peter has commenced a two-days-a-week strength training program. After three weeks he is pleased with the increased weight he can now lift. Which of the following is the **most** likely cause of this increase in strength?
- (a) greater protein uptake resulting in muscle hypertrophy
 - (b) increased frequency of use of thick and thin filaments in the sarcomere
 - (c) better coordination of firing patterns in recruiting motor units
 - (d) reduced firing rate of motor units to enable greater recruitment of muscle fibres

11. Sliding filament theory explains how a muscle contracts. Which of the following statements about this theory is correct?
- (a) Sarcomeres stretch during concentric contraction due to the energy released by the myosin and actin filaments.
 - (b) When stimulated by the motor nerve the length of the myosin filaments shortens as the actin filaments slide across the sarcomere surface.
 - (c) A muscle contraction occurs because the actin and myosin fibres slide across each other and shorten the sarcomere releasing energy.
 - (d) The Z-lines release energy as the sarcomere and the actin and myosin filaments slide and shorten.
12. With respect to force-length relationship in muscle contraction, which of the following statements is true?
- (a) Longer, more slender muscles have the potential to move joints through a greater range of motion.
 - (b) Longer muscles with the greatest cross sectional area have the potential to produce the least force.
 - (c) Shorter, more slender muscles have the potential to move joints through a greater range of motion.
 - (d) Shorter muscles with the greatest cross-sectional area have the potential to create the least force.
13. Select the correct terms to complete the following description.
- _____ is the fibrous sheath around an entire skeletal muscle and
_____ is the sheath of connective tissue surrounding a bundle of muscle fibre.
- (a) Epimysium; perimysium
 - (b) Epimysium; endomysium
 - (c) Perimysium; fascicle
 - (d) Perimysium; endomysium
14. Despite having a squad of very talented players, a coach is experiencing difficulty with a small, rebel group of skilled players who are not committing to training or to the team. She refers to Carron's model of group cohesion for ideas. Which of the following **best** demonstrates that the coach has understood Carron's model and applied it correctly?
- (a) takes a vote to find the most liked player of that rebel group and gives the player a leadership role in the team
 - (b) cuts the rebel players from the squad and recruits new players she hopes will be more compatible within the team
 - (c) presents these most skilled yet difficult players with a more attractive player contract compared to the others to buy their obligation to the team
 - (d) conducts a series of squad meetings after early training sessions to establish 'buy in' to team goals for the season

15. Golf putting demands intense concentration blended with precise motor coordination. 'Over thinking' can interfere with motor skill precision. Which of the following strategies is **most** likely to assist a player whose mental tension is interfering with their fine touch?
- (a) undertake more intensive practice in putting to improve muscle coordination
 - (b) develop a mental and physical relaxation regime as a performance ritual
 - (c) compete in as many tournaments as possible to practise skills under competition pressure
 - (d) closely monitor performance by means of an error checklist during the competition season ahead

End of Section One

See next page

Section Two: Short answer**31.5% (45 Marks)**

This section has **eight (8)** 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.

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Suggested working time: 70 minutes.

Question 16**(6 marks)**

The illustration shows a gymnast performing a back somersault while changing body positions when airborne.

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(a) Circle the correct response.

(1 mark)

During the tuck phase of the back somersault, angular momentum will

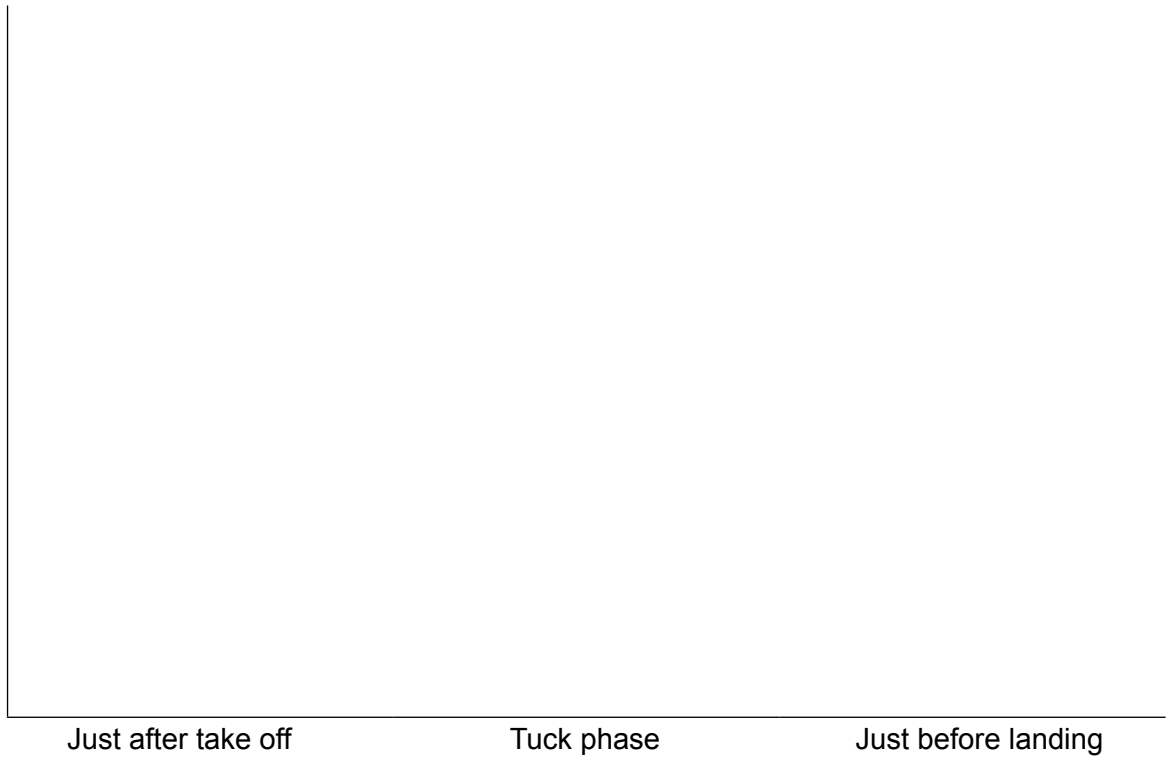
increase.

decrease.

remain constant.

See next page

- (b) On the axes below, graph the relative change in the moment of inertia, the angular velocity and the resulting angular momentum in the somersault from just after the take off phase to the tuck phase, then to just before the landing phase. Label your lines clearly. (3 marks)



- (c) Assuming angular momentum is fixed, describe the **two** variables that limit the number of somersaults this gymnast can complete once airborne. (2 marks)

Variable one: _____

Variable two: _____

Question 17

(6 marks)

The picture below shows a bicycle pedal arm as a lever with the letters 'A' to 'E' representing it in **five** different positions.



- (a) The pedal arm is an example of which type of lever? (1 mark)

- (b) Circle which letter represents the position at which the greatest moment of force (torque) is applied. (1 mark)

A B C D E

- (c) Explain **two** changes that could increase this lever's output and enable a cyclist to increase their linear velocity. (2 marks)

- (d) If seat height is not adjusted in relation to the rider's leg length, the efficiency of force application is affected. State the functional anatomy principle behind this and explain its effect when the seat is set too low, resulting in extreme hip and knee flexion, with the heels being close to the buttocks during pedalling. (2 marks)

Principle: _____

Seat too low: _____

Question 18

(6 marks)

In 1968, the East German chief medical officer recommended compulsory administration of anabolic steroids to all of that country's athletes. For the next decade, the East German Olympic team placed in the top three in the medal tally, breaking many world records. Unfortunately, this regime had lasting negative physiological side effects on the athletes. State **two** short-term and **four** long-term negative physiological side effects that a male athlete on this team may have encountered.

Short term: _____

Long term: _____

Question 19

(5 marks)

An athlete is preparing to compete in a triathlon at the Olympic Games, which comprises a 1.5 km swim, a 40 km bike ride and a 10 km run.

- (a) In terms of the glycemic index (GI), justify the type of foods a triathlete should consume in the lead-up to, during and immediately after the event. (3 marks)

Lead-up to: _____

During: _____

Immediately after: _____

- (b) On the basis of your answers in Part (a), give a specific example of an appropriate food the athlete could consume in the lead-up to and during the triathlon. (2 marks)

Lead-up to: _____

During: _____

Question 20

(6 marks)

Your coach is concerned at the quality of your final quarter play in your chosen team sport and decides to video your performance in that part of a tough competition game.

- (a) Discuss the process of using video methods to analyse and reflect on performance in a sport of your choice. Include at least **four** steps in your answer. (2 marks)

- (b) Give an example of **one** skill weakness and **one** physiological weakness that you observe from the video of your final quarter play in the sport of your choice. (2 marks)

- (c) Describe how the information could be addressed at your next training session. Consider each weakness observed in Part (b). (2 marks)

Question 21

(6 marks)

An effective coach will adapt their leadership style to suit different team circumstances. Assume you are coaching a novice team. For each leadership style, describe **one** coaching situation for which the style is appropriate and **one** negative consequence of using only that style.

	Description	
Coaching Style	Coaching situation appropriate for this style	Negative consequence of using only this style
Casual/Laissez-faire		
Authoritarian		
Democratic		

Question 22

(5 marks)

For an athlete's thought 'to bounce and catch a tennis ball' to become a precise motor action, the information must be sent from the brain to the arm and hand muscles.

- (a) Describe the function of the following elements of the neuromuscular system involved in producing this action. (3 marks)

Axons of the motor neurone: _____

Dendrites of the sensory neurone: _____

Spinal cord: _____

- (b) Define the motor unit. (1 mark)

- (c) Explain the 'all-or-nothing' principle of muscle stimulation. (1 mark)

Question 23

(5 marks)

(a) Define social loafing.

(1 mark)

(b) To demonstrate your understanding of Carron's model of group cohesion, identify and apply with an example each of the **four** factors to your performance as a member of a sporting team.

(4 marks)

End of Section Two

See next page

Section Three: Extended answer

28% (40 Marks)

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

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Suggested working time: 60 minutes.

Question 24

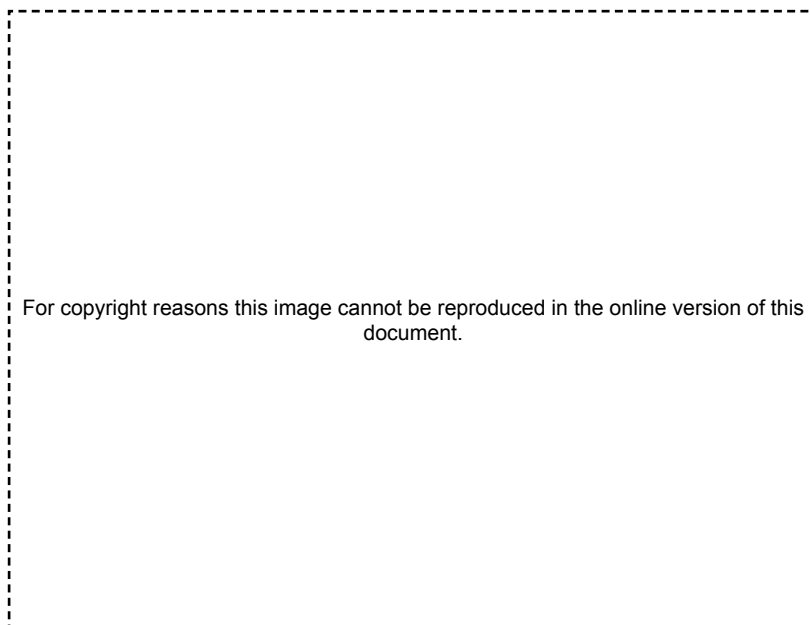
(20 marks)

(a) Soccer involves striking patterns using the lower leg rather than an implement (see image below). Demonstrate your understanding of any **four** of the following biomechanical principles when striking (kicking) the ball in soccer.

- segmental interaction
- force-time
- inertia
- optimal projection
- spin

To assist your explanations, you may include fully-labelled diagrams.

(12 marks)



(b) In 2007, FIFA, the ruling body of international soccer, introduced a ban on international matches at venues more than 2500 metres above sea level. It cited concerns over players' health and the unfair advantage gained by acclimatised home teams. Identify **four** physiological adaptations of players acclimatised to altitude and explain how the physiological adaptations would be an advantage to player performance. (8 marks)

and/or

Question 25

(20 marks)

Mary is a promising triathlete training for an élite under-23 championship. She posts fast times for the 40 km cycle leg and average times for the 10 km run leg, but the 1500 m swimming leg of the race is her weakest. She is slow at the start of the swim leg, especially when diving into ocean waves.

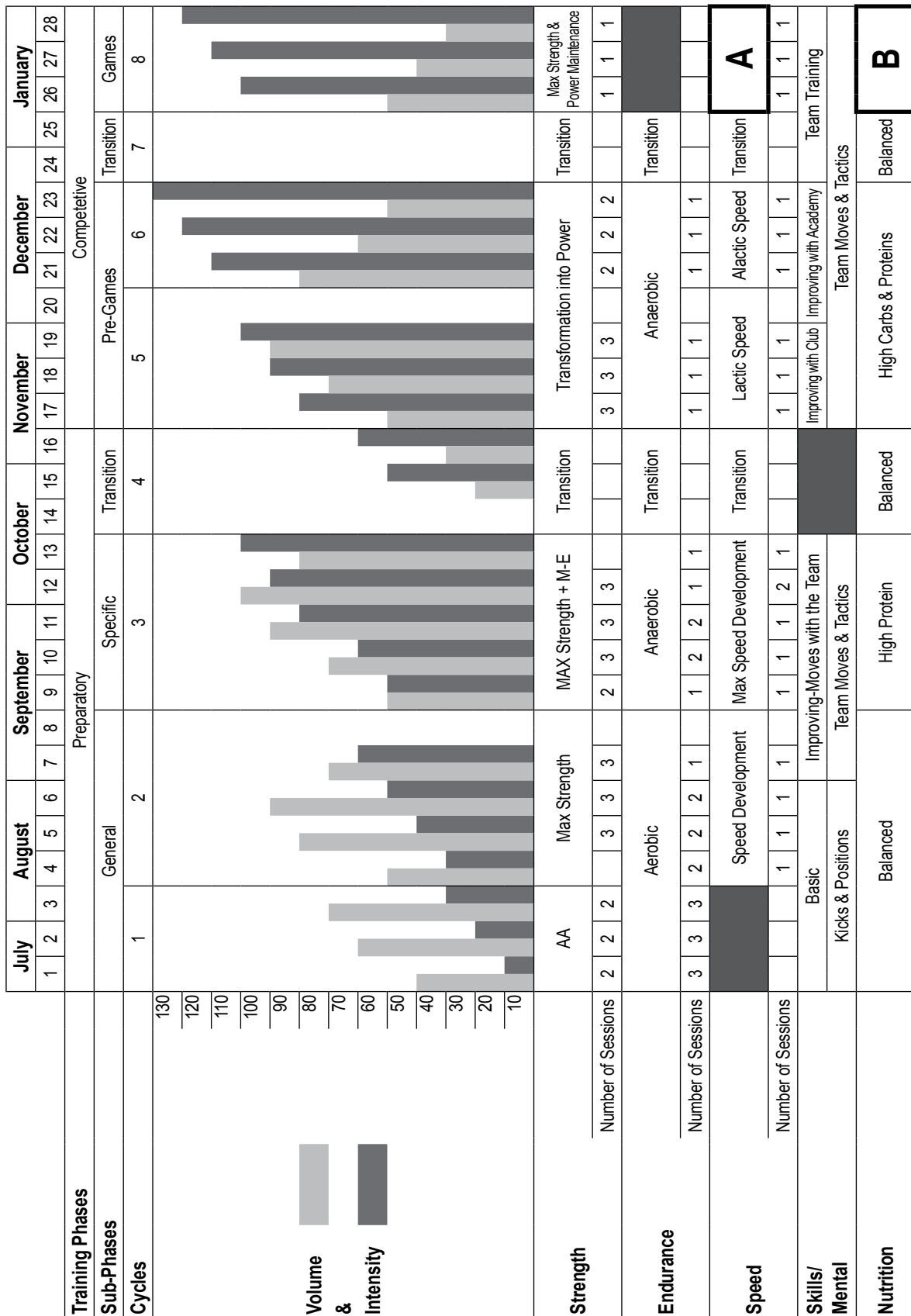
(a) Assume the coach wishes to focus on improving her dive entry technique:

- using specific examples, apply **three** methods of analysis that her coach could use to detect skill errors in the dive entry, and
- using specific examples, explain how he could use both theory-to-practice and training-to-competition principles to provide positive learning transfer to ocean settings. In your answer, define these transfer categories. (12 marks)

Question 26

(20 marks)

Below is an example of a periodisation chart for a rugby player recovering from a knee injury. Note that labels for some training blocks are obscured.



See next page

(b) Stephen has just competed in the hurdles event of the decathlon in front of his home crowd. This is usually one of his strongest events and his performance is normally flawless. Public expectations of Stephen were high. However, he clipped three hurdles in the last half of the 110 m race and nearly fell over. His confidence has been shaken. He is anxious, feeling unsettled and nervous, as his next event, the discus, is one of his weakest. Discuss how Stephen could apply **four** mental skills strategies to help him re-focus for the discus event, which starts in 15 minutes' time. (8 marks)

ACKNOWLEDGEMENTS

Section One

Question 1 Graph of ball trajectories by courtesy of the examining panel.

Question 4 Right-handed boomerang and cross-section [Image] from: *How does X work? How does a boomerang work?* Retrieved April 14, 2012, from www.quora.com/How-Does-X-Work/How-does-a-boomerang-work. Copyright 4Physics®.

Question 7 Graph of training intensity by courtesy of the examining panel.

Section Two

Question 16 Diagram adapted from: Tribble, P. (2008). Do a back flip [Image] from: Van Deusen, A. *Learn a back flip*. Retrieved February 20, 2012, from <http://gymnastics.about.com/>.

Question 17 Image of bicycle pedal adapted from: Fischer, D. (2007, March 6). *Fixed gear bike for AF1 Exhibition*. Retrieved February 20, 2012, from www.highsnobiety.com/.

Section Three

Question 24(a) Soccer kick [Image] from: www.footiewallpapers.com/soccer-kick-image-jpg-748x702px/omegaalpha.ca%7Cpictures%7Ccontent%7Csoccer%20kick.jp/.

Question 26 Periodisation chart adapted from: *Rugby player after injury* [Chart]. Retrieved February 20, 2012, from <http://training-periodization.com/what-will-you-find/what-will-you-find/examples/rugby-player-after-injury/>.

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