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

WACE
Western Australian Certificate of Education

PHYSICAL EDUCATION STUDIES

Stage 2

WACE Examination 2013

Marking Key

Marking keys are an explicit statement about what the examiner expects of candidates when they respond to a question. They are essential to fair assessment because their proper construction underpins reliability and validity.

Section One: Multiple-choice **14% (20 Marks)**

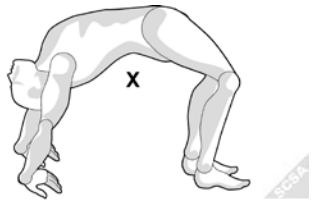
Question	Answer
1	b
2	a
3	b
4	a
5	d
6	a
7	c
8	d
9	d
10	a
11	a
12	b
13	b
14	d
15	c
16	c
17	a
18	c
19	b
20	a

Section Two: Short answer **42% (60 Marks)**

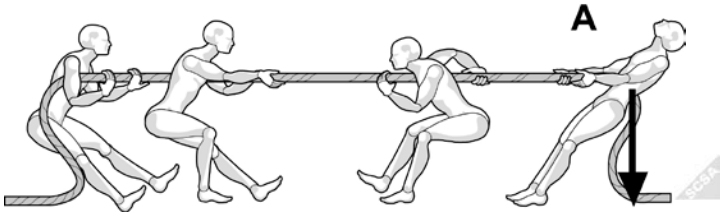
Question 21 **(4 marks)**

With respect to the principle of balance:

(a) (i) draw with an (X) the approximate position of the centre of gravity. (1 mark)

Description	Marks
Marked centrally outside the body below backside 	1
Total	**1**

(ii) draw the line of gravity for Person A. (1 mark)

Description	Marks
An arrow drawn from around the centre of gravity downwards 	1
Total	**1**

(b) State **two** ways by which an athlete could decrease their base of support if this was their starting position. (2 marks)

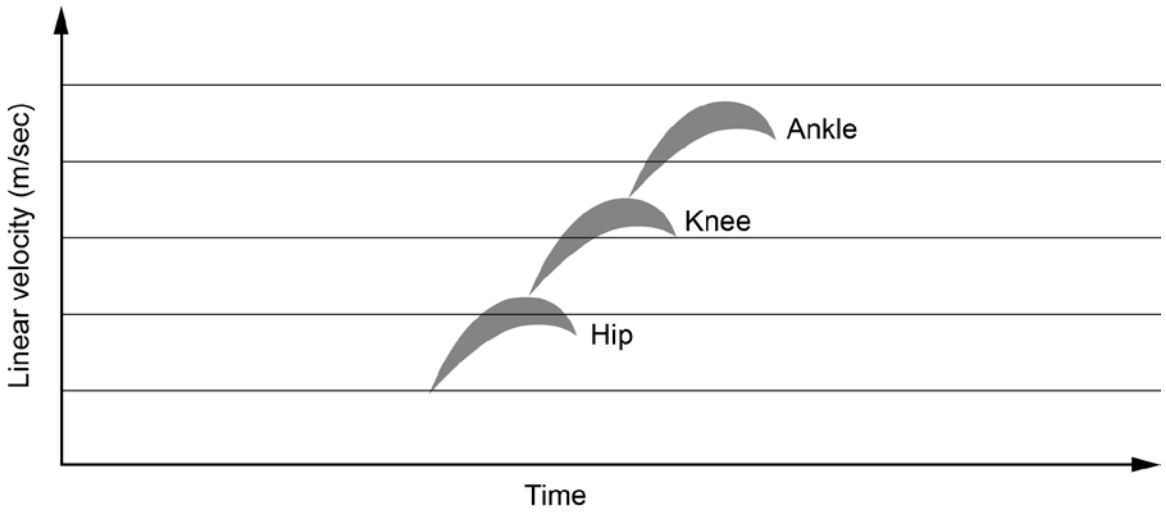
Description	Marks
Two of the three options	1–2
Feet closer together One foot raised Up on their toes	
Total	**2**

Question 22 **(6 marks)**

(a) Classify what type of movement this is from the coordination continuum. (1 mark)

Description	Marks
Sequential movement	1
Total	**1**

(b) On the graph below, draw and label the optimal timing of the action of the hip, knee and ankle joints for maximum foot velocity, when kicking the ball. (3 marks)



Description	Marks
Hip, knee, ankle – in correct order	1
Timing is correct (spread out)	1
Each line increases off the maximum point and follows deceleration	1
Total	**3**

(c) Describe the **two** biomechanical factors that would maximise the velocity of impact with the ball. (2 marks)

Description	Marks
Increase angular velocity/angular motion of the leg before the ball is struck	1
Increase the length of the kicking leg by extension of each joint	1
Total	**2**

Question 23 **(6 marks)**

After a period of eight weeks of regular, programmed training an athlete's body will develop long-term adaptations. For the circulatory system identify **three** of these adaptations and describe how an athlete's body will have adapted over the duration of the training program.

Description	Marks
1 mark each identified adaptation, 1 mark for each description	
cardiac output – increased heart rate (HR) – decreased at rest blood pressure (BP) – decreased at rest blood volume – increased haemoglobin – increased stroke volume (or HR x CO = SV) – increased capillarisation – increased number of blood vessels	1–6
Total	**6**

Question 24 **(6 marks)**

The table below identifies the relationship among fitness components, training types and training principles.

Consider a professional squash player and answer the following.

(a) For cardio-respiratory endurance, circle the **most** correct training type and identify the **most** relevant training principle.

(b) For power, circle the **most** correct training type and identify the **most** relevant training principle.

(c) For agility, identify the **most** correct training type and circle the **most** correct training principle.

Description			**Marks**
Fitness Component	**Training Type**	**Training Principle**	
Cardio-respiratory endurance	Circle: Circuit Flexibility Resistance	(a) Duration or Specificty	1–6
Power	Circuit ~~Flexibility~~ Circle: Resistance	(b) Intensity	
Agility	(c) Flexibility	Progressive overload Circle: Specificity Reversibility	
		Total	**6**

Question 25 **(6 marks)**

(a) Is this a fine or gross motor skill? (2 marks)
Justify your classification.

(b) Is this a closed or open motor skill? (2 marks)
Justify your classification.

(c) Is this a discrete, serial or continuous motor skill? (2 marks)
Justify your classification.

Description		**Marks**
1 mark for classification of skill, 1 mark for justification		
(a)	Fine – Justify: muscles of wrist and hand acting to release shuttle and move racquet; rest of body still and balanced or similar	1–2
(b)	Closed – Justify: self-timed, server sets pace, selects the timing, when to serve, environmental factors remain constant or similar	1–2
(c)	Discrete – Justify: defined start and end point to the serve action; a single coordinated action from preparation to impact to follow through or similar	1–2
	Total	**6**

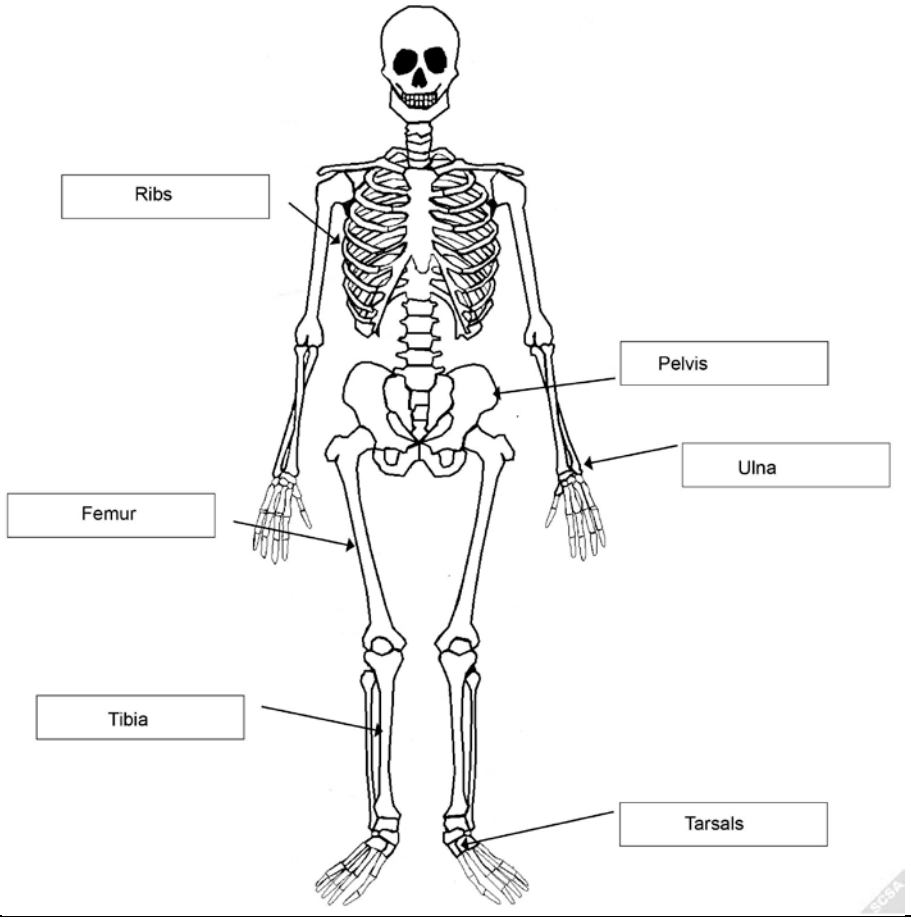
Question 26 **(4 marks)**

Feedback from a coach is critical in improving a player's performance. It is acknowledged that feedback serves two purposes. Using a sport of your choice, identify each purpose and provide an example.

Description	Marks
Purpose one – reinforcement Example – states what the players are doing well	1 1
Purpose two – motivation Example – keep his/her players focussed, encouragement. Positive statements used **Must use different example for each purpose**.	1 1
Total	**4**

Question 27 **(6 marks)**

Label the **six** bones on the diagram below.

Description	Marks
1 mark per correct label 	
ribs	1
femur	1
tibia	1
pelvis	1
ulna	1
tarsals	1
Total	**6**

Question 28 **(6 marks)**

(a) Match each of the following labels to the correct diagram number. (3 marks)

Description			Marks
I.	Exhalation phase	Diagram 1	1
II.	Diaphragm contracting	Diagram 2	1
III.	Rib cage expanding	Diagram 2	1
		Total	**3**

(b) Explain the actions of the diaphragm muscle and the rib cage during inhalation in a deep breath. (3 marks)

Description	Marks
Contraction of diaphragm causes muscle sheet to flatten and increase volume of chest	1
Rib cage 8 – to increase volume in chest	1
Increased chest volume reduces air pressure inside relative to outside and air flows into the lungs from high pressure (outside) to low pressure (inside)	1
Total	**3**

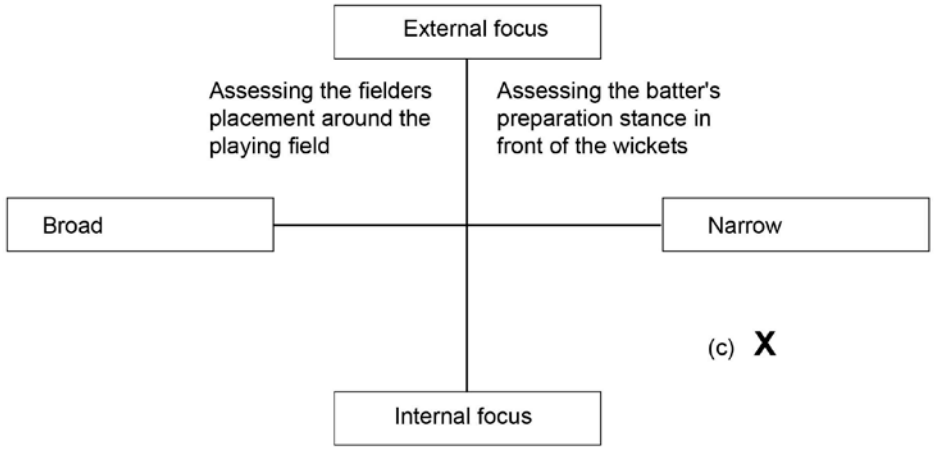
Question 29 **(6 marks)**

(a) Taking into account the situations stated in the diagram below, label the ends of each line in accordance with Nideffer's model. (2 marks)

(b) By applying Nideffer's model, the coach was attempting to improve one particular mental skill in Mitchell. Name this skill. (1 mark)

(c) On the diagram above, mark with 'X' the area in which the 'TUFF' phrase should be located. (1 mark)

(d) Justify your choice of location for 'X' in this model. (2 marks)

Description		Marks
		1–2
(a)	I mark for each correctly labelled line	
	external – internal broad – narrow	
(b)	Attention control **or** concentration	1
(c)	X in correct quadrant (i.e. bottom right hand quadrant)	1
(d)	1 mark for internal focus; 1 mark for narrow focus	
	Justify – TUFF directs Mitchell to narrow focus (his own action and not the crowd noises) and internal focus (kinaesthetic aspects of his action) in attention.	1–2
	Total	**6**

Question 30 **(6 marks)**

Motivation is one essential ingredient for participation in sport.

(a) Define the term 'motivation' as it applies to sport performance. (1 mark)

(b) Insert the terms that correctly complete the following statement. (2 marks)
Players who play long term regardless of whether their team is successful or not, demonstrate, whereas players who drop out if _____they do not win awards demonstrate _____motivation.

(c) You hear a soccer coach of unskilled seven year olds say, "Next season, I am going to introduce best player and highest possession getter awards every match. That will really motivate them to lift their game!" In terms of motivation and age, give **two** reasons why such an approach is not appropriate for such young teams and give **one** suggestion for a better approach to boosting motivation. (3 marks)

Description	Marks
(a) Motivation is the driving force behind an athlete's desire and the determination to achieve their goals	1
(b) intrinsic	1
extrinsic	1
(c) 2 marks for two valid points related to motivation and age, such as ...	1–2
• 7 yr old unskilled players are intrinsically motivated – coach should boost/build intrinsic motivation • over emphasis on weekly awards is extrinsic motivation which can lessen intrinsic motivation – might play for the award and not the fun of it • Less skilled players may feel left out and not recognised , or other valid point	
1 mark for one valid example of alternate approach	1
• Boost intrinsic motivation via fun / friendship • Boost intrinsic motivation by feedback / praise / encouragement • Boost intrinsic motivation by increasing skill	
Total	**6**

Question 31 **(4 marks)**

Using examples, identify and describe the **two** types of feedback an Australian hockey player would use during an international game of hockey.

Description	Marks
Name for 1 mark, example for 1 mark Intrinsic – proprioception, kinaesthetic awareness	1–2
Extrinsic – coach, team mates, crowd, scoreboard etc	1–2
Total	**4**

Section Three: Extended answer **14% (20 Marks)**

Question 32 **(10 marks)**

(a) Define Newton's three laws of motion. Demonstrate your understanding of these laws in relation to long jump when the foot is in contact with the take-off board. (6 marks)

Description	Marks
A maximum of 2 marks for each law 1 mark per valid definition 1 mark per valid application of the law to the long jump take	
Newtons 1st Law of motion An object will remain at rest or in its current state of motion unless acted upon by a force. (or suitable textbook definition)	1
When the athlete plants the foot he/she absorbs a muscular force of sufficient magnitude in order to change their state of forward motion and move it forward and upward **or** The athlete exerts a large muscular force against the ground causing them to accelerate off the ground and upwards through the air	1
Newtons 2nd Law of motion (F=ma not accepted) The acceleration of a body is directly proportional to the force acting on it and indirectly proportional to its mass. (or suitable textbook definition)	1
The acceleration of the athlete is directly proportional to the force provided by the muscles and is indirectly proportional to the mass of the athlete. The lighter the athlete the greater the acceleration compared to the heavier athlete who will have lower acceleration or The athlete that goes the furthest will have a greater force applied at take off causing them to have greater acceleration or the shorter jump had less force applied causing it to have less acceleration	1
Newtons 3rd Law of motion For every action there is an equal and opposite reaction (or suitable textbook definition)	1
When the force is applied to the body there is an equal and opposite force that is applied to the take off board (ground force reaction). The greater the force applied to the take off board the greater the reaction force (lift) on the take off leg	1
Total	**6**

(b) Explain which **four** components of fitness are important for success in long jumping. (4 marks)

Description	Marks
Any four **explained** of the following:	
Speed – for the run up. More speed the greater distance possible Power – for take off. Allows for an explosive force off from the board Balance – Flight and landing. Maintains stability in the air and on impact Flexibility – allows for full extension at joints and increased range of movement or reach or helps the athlete avoid injuring the muscle, connective tissue and joints while competing. Strength – allows the athlete to control and change the direction of the athlete's centre of mass Body composition – leaner body will allow greater acceleration Coordination – e.g. getting the foot on the board Exclude – CRE, ME, Agility (tests for lateral), RT	1–4
Total	**4**

Question 33 **(10 marks)**

(a) For Melinda to be able to compete in her first marathon race, define the **three** most relevant training types she would have included in her preparation. For each of these training types, explain, with a specific example, how Melinda would have applied progressive overload in her training program. (6 marks)

Description	Marks
Training Types – definition below or appropriate textbook definition	
Continuous – going for long distance or timed runs at a low intensity	1
Fartlek – speed play, continually altering speed in runs at specified times/distances	1
Interval – using work to rest ratios	1
Description	
Application of Progressive Overload	
Continuous – increase the time **or** distance by 10% per week	1
Fartlek – when she wants to increase her speed (km/h)	1
Interval – increase the length of time or distance of each interval, with appropriate rest ratio	1
Total	**6**

(b) Running a marathon requires not only physical ability, but also a significant level of mental ability. In the moments leading up to the start of the race and for the duration of the race, identify and describe **two** mental skills strategies Melinda will need to implement to ensure she remains mentally focused. (4 marks)

Description	Marks
1 mark each	1–2
Self talk Self-imagery (visualising) Relaxation	
1 mark each	1–2
Self talk – e.g. before or during the race using positive words/affirmations	
Self-imagery – e.g. visualising herself crossing the finish line in good shape	
Relaxation – e.g. centred breathing before race, getting into race rhythm early in race but not progressive muscle relaxation	
Total	**4**

Question 34 **(10 marks)**

(a) Name the Fitts and Posner learning stage represented by the goal shooter in Images 2 and 3. Other than the quality of motor coordination of each player, describe **two c**haracteristics of each stage that a coach would need to consider when instructing these players. (6 marks)

Description	Marks
1 mark for name of stage and 1 mark each for up to 2 correct characteristic per stage. Consider the 1st two characteristics per stage only.	
Image 2 – Autonomous	1
– up to 2 valid and different characteristics from … Refer to the table	1–2
Image 3 – Cognitive	1
– up to 2 valid characteristics from ... Refer to the table	1–2
Total	**6**

Fitts and Posner Learning Stages	**Cognitive Stage** Requires thought (mental picture of the skill) and development of parts of the skill	**Autonomous Stage** The performed skill is now learned so we don't really think about it – becomes automatic.
Skill	Needs to know what has to be done and how equipment is to be used Slow to respond correctly (decision and reaction time)	Responds automatically with skills appropriate for the situation Skills performed without conscious thought Speed and efficiency of skills is increased Rapid decisions and reaction time Plenty of time to execute action
Attention	Focus on individual skills rather than team skills Paying attention to correct execution Fatigue set in quicker Forms a rough mental plan – visual Easily flustered/ panics / anxious	Focus is more tactical/strategic rather than skill focused Read play, anticipate Calm, focused not flustered
Cues	Visual cues predominate Overload by information Little ability to detect relevant v's irrelevant cues Confused by competing cues	Has spare attention to devote to other tasks Selects relevant cues And proprioceptive cues more used
Errors	Makes frequent large errors Little capacity to correct own errors Cannot recognise what caused execution errors	Makes infrequent skill errors Can identify cause of errors and self correct
Feedback	Requires a great deal of feedback Immediate	Uses feedback precisely Relies more on internal feedback Benefits from self analysis

(b) Observe how the netballer in Image 1 is using her legs and arms during the shooting action. Her objective is to release the ball as high as possible. For both the elbow and knee joints, name the muscles and describe the type of movement at these joints in order to produce a high ball release. (4 marks)

Description	Marks
1 mark for the muscle and 1 mark for correct action	
quadriceps muscle – description includes knee extension	1–2
triceps muscle – description includes elbow extension	1–2
Total	**4**

Question 35 **(10 marks)**

(a) Demonstrate your knowledge of the respiratory and circulatory systems by explaining the correct pathway an oxygen molecule would travel from inside the lungs to the capillaries of the working muscle. Your answer must include **six** functional anatomy structures. (6 marks)

Description	Marks
One mark for each explanation of the correct term in sequential order (answers can miss out some parts, but cannot have them in the wrong order): Max 6 1 out of place 5 marks 2 out of place 4 marks 3 out of place 3 marks 4 out of place 2 sequential = 2 marks 5 out of place 1 mark 6 all out of place – 0 mark	
1. Alveoli - Gaseous exchange takes place in the alveoli	1
2. or 3. Blood - the fluid that is moved in the circulatory system carrying the O_2 molecule	1
3. or 2. Capillaries - Alveoli are surrounded by capillaries allowing O_2 exchange	1
4. Vein (does not have to be Pulmonary Vein) - receives oxygenated blood from the lungs	1
5. Heart **or** Left Atrium and Left Ventricle - the muscular pump that drives blood around the body	1
6. Arteries **or** Aorta - carry blood away from the heart.	1
Total	**6**

(b) This oxygen pathway is repeated many times with physical activity. Explain **four** immediate responses of the respiratory system to physical activity. (4 marks)

Description	Marks
1 mark per explanation of respiration system response. Any four of:	
Increased tidal volume e.g. the amount of air inspired with each breath increases Increased ventilation (respiratory rate) e.g. the rate/frequency of breaths increases Increased oxygen up take e.g. there is an increase to the amount of O_2 we take in Increased gas exchange e.g. transfer of O_2 from alveoli into capillaries increases or the transfer of CO_2 from capillaries to alveoli increases Increased arteriovenous O_2 difference e.g. the increased difference is due to greater extraction of O_2 from the arterial blood, which means low O_2 content of venous blood, compared to the re-oxygenated arterial blood in the lungs.	1–4
Total	**4**

ACKNOWLEDGEMENTS

Question 12
http://0.tqn.com/d/gymnastics/1/0/7/4/-/-/Step3.jpg
from http://gymnastics.about.com/od/skillhowtos/ss/handstand_4.htm

Question 19
Graphs courtesy of the Examining Panel

Question 21(a)
http://i51.tinypic.com/2w4e8oh.jpg

Question 21(b)
Diagrams courtesy of the Schools Curriculum and Standards Authority

Question 22
http://omegaalpha.ca/pictures/content/soccer%20kick.jpg
(Editor note Used in PES Stage 3 2012)

Question 22(b)
Graph courtesy of the Schools Curriculum and Standards Authority

Question 25
http://www.birdievents.com/badminton-tips-trainings/short-serve-is-the-essence-in-badminton.html

Question 27
Diagram of skeleton by courtesy of the Examining Panel

Question 28
Diagram courtesy of the Schools Curriculum and Standards Authority

Question 32(a)
Diagram courtesy of the Schools Curriculum and Standards Authority

Question 34
Fig 1
http://www.odt.co.nz/the-regions/central-otago/15248/hard-fought-games-netball-finals-near (accessed 28/12/12)

Fig 2
http://nz.sports.yahoo.com/netball/news/article/-/15343657/shooter-plays-down-role-in-history/ (accessed 28/12/12)

Fig 3
http://www.netball.asn.au/newsitem.asp?id=7845&orgID=1 (accessed 2/1/13)

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