

Physical Education Studies

Marking Guide

Stage 3 2015

Question	Answer
1	B
2	A
3	B
4	C
5	A
6	C
7	A
8	A
9	D
10	B
11	C
12	B
13	B
14	C
15	B

Section Two: Short answer**50% (70 Marks)**

This section has eight questions. Answer all questions. Write your answers in the space 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(s) that you are continuing to answer at the top of the page.

Suggested working time for this section is 70 minutes.

Question 16**5 marks**

Describe the impulse-momentum relationship as it applies to throwing a Frisbee.

One mark for each valid point to a max of 5 marks – cannot get full marks if incorrect points are made (e.g., if the student has 7 points listed and 5 of them are correct, they cannot get full marks)

Answer to include: Impulse is used to increase momentum <ul style="list-style-type: none">• Frisbee has no velocity at the start and the aim of the throw is to increase its velocity so it moves quickly to its target.• Increasing velocity (or change in velocity) is known as momentum or acceleration.	Up to 2 marks
In order to increase momentum of the Frisbee force needs to act on it <ul style="list-style-type: none">• Your body can exert force onto the Frisbee to cause it to gain momentum• Stronger muscles and segmental interaction can increase the amount of force that can be applied to the Frisbee	Up to 2 marks
The longer the force is applied the greater the change in momentum <ul style="list-style-type: none">• Impulse = force x time• The longer force is applied to the Frisbee the more velocity it will gain and the greater the momentum it will have.	Up to 2 marks
Technique can increase impulse <ul style="list-style-type: none">• The thrower can alter their throwing technique to ensure they remain in contact with the Frisbee as long as possible to increase impulse• Increasing impulse will result in more momentum resulting in an increase in the distance the Frisbee is thrown.	Up to 2 marks

Question 17**(8 marks)**

The sliding filament theory explains how the movement of thick and thin filaments relative to each other leads to the contraction and relaxation of whole muscles.

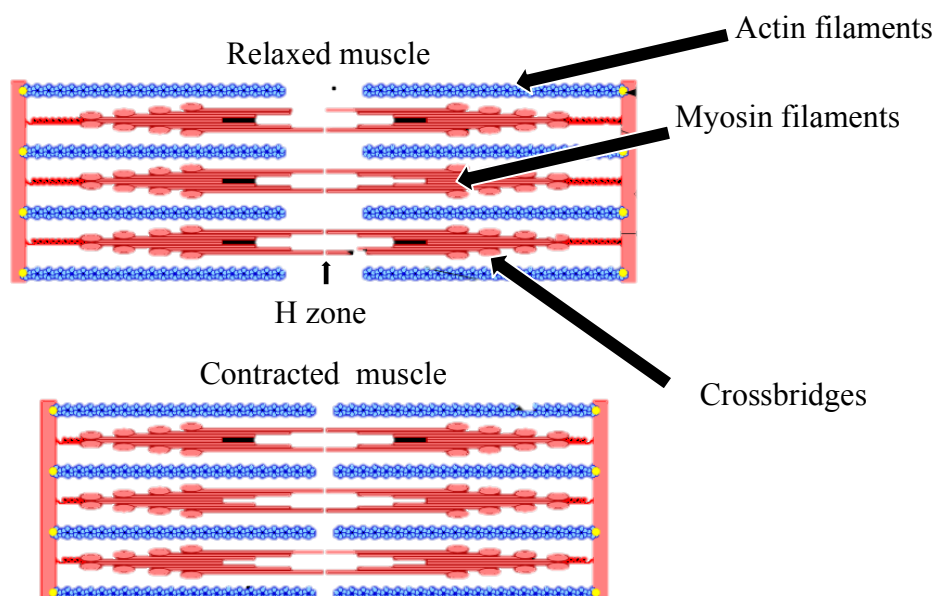
a) Draw and label two diagrams of the sarcomere in the space below, one diagram depicting the sarcomere of a relaxed muscle and one diagram depicting the sarcomere of a fully contracted muscle. (6 marks)

On each diagram label the following parts:

- i) Myosin filaments
- ii) Actin Filaments
- iii) Crossbridges
- iv) H Zone

Space for Diagrams

Three marks for each diagram if structurally correct	
Diagram 1 – relaxed muscle <ul style="list-style-type: none">Structurally correctMust have a H zone and show thin and thick filaments spread apartCrossbridges do not have to all have attachment to the filament (some free ones)	3 marks
Diagram 2 – contracted muscle <ul style="list-style-type: none">Structurally correctMust have thin and thick filaments parallel and on top of each other, no H zone or very smallCrossbridges should all be attached to the filament	3 marks



b) Describe the role of crossbridges in muscle contraction.

(2 marks)

Two marks for detailed description – 1 mark for basic	
<p>Answer can include:</p> <ul style="list-style-type: none"> • Myosin filament reaches toward actin filament and creates a crossbridge • Crossbridge contracts and pulls the actin filament closer to the A band (ratchet like fashion) • All myosin crossbridges contract simultaneously so whole muscle contracts – produces movement 	Up to 2 marks

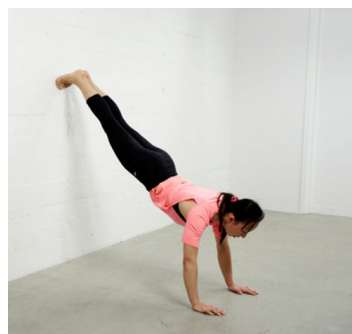
Question 18

(10 marks)

Examine the pictures below that depict progressions used by a coach to teach the handstand skill.



Plank / bridge



Handstand with wall support



Handstand

Classify this coaching activity as either shaping or simple - complex and justify your answer with two valid reasons.

(5 marks)

One mark to identify coaching activity	
Two marks per valid reason	1 mark
<p>Answer can include:</p> <ul style="list-style-type: none"> • Shaping involves the whole action but in modified forms – which in this example could have involved the gymnast doing proper vertical handstands with a spotter until balance improves. So it is not shaping • The bridge requires less complex balance skills, then the wall requires more balance skill but not as much as the full handstand. • Increased strength demand as increased body weight • Centre of gravity changes so more complex balance technique required 	Up to 2 marks each

- b) Identify the effect of transfer of learning from yoga poses to handstands and explain two ways it impacts the skill acquisition process. (3 marks)

One mark for identifying transfer of learning and one mark per valid reason	
Positive transfer of learning	1 mark
Reasons to include: <ul style="list-style-type: none"> Balance skills used in yoga poses will enhance their ability to perform the handstand Yoga will build upper body strength which would help to perform the handstand Proprioception could be enhanced from doing yoga so they will have good understanding of the position of their body and be able to make adjustments 	Up to 1 mark each

Gymnasts need to build strength in their upper body as they develop their handstand skills.

- c) Describe two nutritional considerations that would assist the gymnast as they build strength. (2 marks)

One mark for each valid nutritional consideration	
Answer can include: <ul style="list-style-type: none"> Protein – increasing protein in diet to aid in building muscle e.g. more lean red meat, lentils, legumes and eggs. less emphasis on a very high carbohydrate intake and more emphasis on quality protein and fat consumption fluid replacement – its important to stay hydrated during training and in recovery to allow muscles to function properly 	Up to 2 marks

Question 19**(10 marks)**

Baseball pitching is a smooth, continuous motion that occurs during a relatively brief period. It is agreed by experts that the baseball pitcher uses the entire body in the pitching motion as he goes from the preparation phase, into the execution phase and finally the follow through phase.

- a) Outline **five** biomechanical principles that significantly impact the effectiveness of the baseball pitch. (5 marks)

One mark for each principle. No marks for one word answers, must explain the impact they will have not just define the principle to get the mark.

Answer can include any of the following:

- balance
- coordination continuum
- force-motion
- force-time
- optimal projection
- range of motion
- segmental interaction
- spin

Up to 5 marks

Novice pitchers find pitching a ball with no spin very difficult.

- b) Explain why it is advantageous to have the ability to pitch the ball with no spin. (2 marks)

One marks for each reason

Answer can include:

- unpredictable flight path - can confuse batter,
- Altered trajectory - different to usual pitch so not expecting it

1 mark each

- c) Identify a type of spin (except no spin) that a baseball pitcher may use and explain why this type of spin would alter the trajectory of the ball. (3 marks)

One mark for type of spin and two marks for reason

Spin – top spin, back spin or side spin

1 mark

Reasons can include:

- Speed – spin could change speed of the pitch (either faster or slower depending – need to explain in order to get the mark)
- Altered trajectory – swing or dip etc. trick the batter into striking or cause miss hit
- Magnus effect – explanation of its effect on the ball

Up to 2 marks

Question 20**(6 marks)**

One of the Perth women's triathlon events is held near Hillarys, in the northern suburbs of the city. The women must complete a 750m swim, 20km cycle, 5km run.

Hydration is an important component of this activity and is required to maximise performance. Provide **two** fluid replacement recommendations for athletes prior to the start of the race, during the race and after the race has finished.

Before the race:

(2 marks)

One mark for each recommendation	
Answer can include: <ul style="list-style-type: none">• 1 litre of fluids prior to the start of the race (as per hydration guidelines)• 750ml sports drink• Constant sips of water in the hour before the race	1 mark each

During the race:

(2 marks)

One marks for each recommendation	
Answer can include: <ul style="list-style-type: none">• sip sports drink or flat soft drink throughout race in order to hydrate fluids and top up glycogen stores• sip water but not at levels that far exceed sweat loss – need to avoid hyponatremia.• 200ml fluids every 15 minutes (as per hydration guidelines)	1 mark each

After the race:

(2 marks)

One marks for each recommendation	
Answer can include: <ul style="list-style-type: none">• Consume 125-150% of their estimated fluid losses in the 4-6 hours after exercise• Consume 1.5 litres of fluid for every 1litre of fluid lost• Consume fluids with salt, such as sports drinks and water with salty foods	1 mark each

Question 21**(9 marks)**

A group of Year 11 students at Oaktown Secondary College have begun regularly drinking protein powders. They believe, that by consuming this supplement, they will gain improvements in their sporting performance

- a) Explain **three** physiological changes that occur in the body when performance enhancers such as protein powders are used. (6 marks)

Two marks for each physiological change, no marks for one word answers. More detailed responses get two marks.

Answer can include:

- Increased muscle synthesis
- Speed up recovery
- Macro-nutrient - Provide extra energy for training demand
- Promote glycogen resynthesis

Up to 2 marks each

- b) Many health professionals and trainers believe protein powders are not necessary and possibly even harmful. Explain how a balanced diet could eliminate the need for the use of protein supplements. (3 marks)

Three marks for each explanation depending on detail and accuracy.

Answer can include:

- Protein can be found in diet anyway and many athletes already eat plenty of protein
- Fat consumption (good fats) can help the body utilize protein better
- Foods containing protein also contain vitamins, minerals and fibre that the body needs
- 15% diet should contain protein
- Identify foods that contain protein including meat and pulses.

Students could also list examples of meals or foods that would allow an athlete to eat enough protein and this can get marks also but not the full 3 marks.

Up to 1 mark each

Question 22**(10 marks)**

Johnny Wilkinson was known as the “golden boy” of English rugby after the 2003 English World Cup victory in Australia. He was England’s highest points scorer aged just 24 years. One of Johnny’s roles in the English rugby team was to take the penalty kick for goal, often under immense pressure.

- a) Outline **three** mental skills strategies Johnny could use to manage the stress of such a high-pressure situation as well as helping him to maintain focus. (6 marks)

Two marks for each strategy and explanation. No marks for one word answers	
Answer can include: Provide explanation <ul style="list-style-type: none">• self-talk• relaxation• performance routines• goal-setting• imagery Students must define each strategy as it would apply to this situation.	Up to 2 mark each

- b) Explain how these mental skills and strategies could help him to remain calm and ensure accuracy of his penalty goal kick. (4 marks)

Four marks for explanation. No marks for one word answers	
Answer can include: <ul style="list-style-type: none">• getting him to optimal arousal• stress management• blocking out distractions• focusing on relevant cues• Maintaining motivation• increase self confidence• increase concentration Students must not define the strategy but explain the effect of the strategy– how it would help him.	Up to 4 marks

Question 23**(12 marks)**

a) Define the following three types of drag and provide an example of each:

(6 marks)

Form Drag

Two marks for detailed or clear definition with an example, one mark for basic or less clear. No marks for one word answers	
Resistance created by the fluid to be moved out of the way or shifted. Also known as pressure drag – the pressure exerted by the weight of the fluid. Eg, the water in the pool to be moved by the swimmer as they perform their stroke – the pressure or force the water exerts back onto the swimmer	Up to 2 marks

Surface Drag

Two marks for detailed or clear definition, one mark for basic or less clear. No marks for one word answers	
Resistance created by the fluid as it comes into contact with the body. Also known as skin friction. Eg the friction between the swim suit and the water, smoother swim suit = less friction	Up to 2 marks

Wave Drag

Two marks for detailed or clear definition, one mark for basic or less clear. No marks for one word answers	
Resistance created by wave formation, waves buffer the body and exert force against the body. Can be determined by closeness to the edge of the pool wall and the depth of the water Eg the wave coming off a swimmer in the lane next to the swimmer due to their stroke.	Up to 2 marks

b) Explain the impact of each of these types of drag on the performance of competitors in a 50m freestyle swimming race. (6 marks)

Two marks for explanation of each impact – need three impacts to get full marks – explanation needs to be provided	
Impacts could include: <ul style="list-style-type: none">• Slower swim time – due to the drag slowing down the swimmer – exerting opposite force onto the body• Increased fatigue – increased strength or effort required to overcome drag force resulting in fatigue sooner or to a larger degree• Impact on stroke technique – fatigue can reduce stroke efficiency or wave drag could make neat strokes difficult• Disadvantage – e.g. if they have bathers that increase friction but others in the race have smooth swim suits	Up to 2 marks each

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

This section has four questions. Answer **two** questions. Write your answers in the space provided. Each question is awarded **15** marks. 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.

Suggested working time for this section is 50 minutes.

Question 24**(15 marks)**

Soccer coaches will use periodisation to organise their training programmes so that their players are at their peak performance for the finals.

Describe how a soccer coach would use periodisation including a description of the micro cycle, macro cycle, pre-season, in-season and off-season.

Three marks for detailed or clear description of the factor, one mark for basic or less clear. Must have an example / application to get full marks.	
Micro cycle: <ul style="list-style-type: none">• shortest training cycle, typically consisting of a single week or two with the goal of facilitating a focused block of training• Give an example of how this would look in soccer for example a series of training sessions within one week	Up to 3 marks
Macro cycle: <ul style="list-style-type: none">• Year plan (52 weeks), includes all four stages of a periodized training program (endurance, intensity, competition and recovery).• Overview of the goals for the year and important competition phases such as finals.	Up to 3 marks
Pre season: <ul style="list-style-type: none">• Fitness work before the games begin• Cardiovascular and endurance training (continuous and interval training)• May not use soccer balls as not skills training, mainly running• Flexibility training, mental skills training	Up to 3 marks

<p>In season:</p> <ul style="list-style-type: none"> • Goal is to maintain the fitness you developed during pre season. • Regular, competitive matches maintain basic levels of endurance so any additional soccer training should concentrate on speed, power and anaerobic endurance development. • Skill development and tactical training • Match specific routines such as set plays and goal shooting 	Up to 3 marks
<p>Off season:</p> <ul style="list-style-type: none"> • Maintain fitness so pre-season next year isn't too hard • Cross training • Leisure training such as bushwalking or ocean swimming to have a mental break and recover emotionally from season • Physiological maintenance eg surgery, physio, ultrasound etc 	Up to 3 marks

Question 25

(15 marks)

Explain the importance of Carron's model of group cohesion as it applies to team performance. Outline possible strategies that can be used to increase team cohesion and discuss the negative impact of social loafing.

Five marks for explanation Carron's model and it's 4 main components	
<p>Team cohesion is a dynamic process which is the tendency for a group to stick together and remain united in the pursuit for its goals and objectives. Distinction between task and social cohesion.</p> <p>Four components:</p> <ul style="list-style-type: none"> • Environmental – refers to regulations within a sport and local rules • Personal – characteristics of the team members • Leadership – relate to such aspects as coaching behaviour • Team factors – all the characteristics and relationships of the group, norms and stability. 	Up to 5 marks each
Six marks for discussion of how the model applies to team performance & description of social loafing	
<p>Higher team cohesion leads to:</p> <ul style="list-style-type: none"> • Improved performance • Players will have stronger commitment to team goals • Greater participation in decision making • Increased on field communication • Lower levels of anxiety & emotional difficulties <p>Social loafing:</p> <ul style="list-style-type: none"> • exerting less effort to achieve a goal when in a group 	Up to 6 marks each

Four marks for strategies to improve

Answers could include:

- Goal setting
- Uniforms & team merchandise
- Team building activities
- Change in leadership style to suit team
- Promoting player leadership such as captains, mentors etc
- Debriefing sessions
- Developing positive group norms within the team / club

Up to 4 marks

Question 26**(15 marks)**

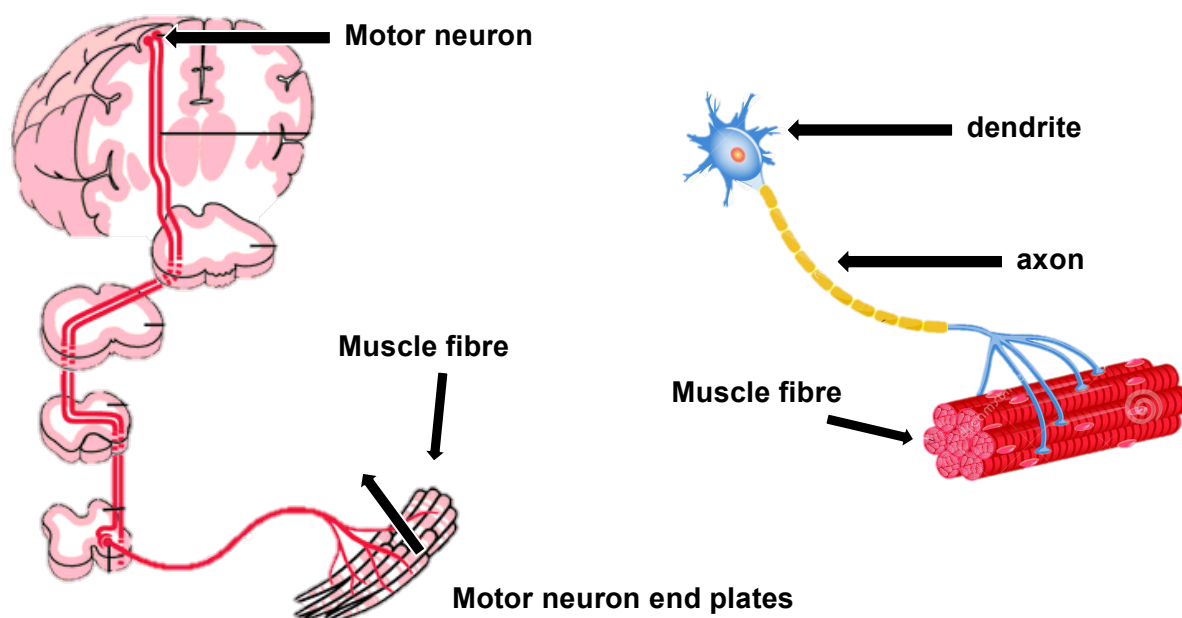
A cricket batsman must detect when the ball is released from the bowler and react to this action by engaging the body to hit the ball and play a shot.

- a) Draw and label a diagram illustrating the path of the neural signal from the brain to the active muscles in the body as he perceives the bowling of the ball and moves his body to play a shot. (5 marks)

Label the following parts on your diagram:

- i) Motor neuron – including dendrite and axon
- iii) Motor neuron end plates
- iii) Muscle fibres

One mark for diagram accuracy and one mark for each correct label



b) Explain how a neural signal in the rain initiates muscle contraction.

(10 marks)

Ten marks for discussing the relationship between muscle contraction and nerve function

- Nerves initiate muscle contraction
- Motor neuron in brain sends signal via spinal cord to active muscle
- Muscles have the property – excitability – which means they react to stimuli such as nerve impulses.
- Impulse from nerve is transmitted to the sarcomere
- The impulse travels along the the sarcoplasmic reticulum.
- Skeletal muscle is voluntary muscle and won't contract without signal from the nerve.
- Muscle relaxes when the nerve signal stops
- Decline in ATP levels (due to repeated contraction) in a muscle causes muscle fatigue. Even though a nerve impulse is being transmitted to the muscle, contraction (or at least a strong contraction) is not possible.

Up to 2 marks each

Question 27

(15 marks)

Examine the following table depicting the coefficient of restitution of squash balls when they are bouncing off hardwood floor.

Squash ball	Coefficient of restitution
Yellow dot	0.41
White dot	0.46
Red dot	0.48
Blue dot	0.50

- a) Define coefficient of restitution and explain why it would have an effect on gameplay in a sport such as squash. (5 marks)

Two marks for definition and three marks for explanation as to why it would have an effect.	
Definition: <ul style="list-style-type: none"> The ratio of the relative velocity after impact to the relative velocity before the impact of two colliding bodies, equal to 1 for an elastic collision and 0 for an inelastic collision. The ball is first compressed (upon impact) and then undergoes restitution (during rebound) 	Up to 2 marks
Effects could include: <ul style="list-style-type: none"> Low restitution = low bounce High restitution = higher bounce Restitution is always between 0 and 1. Close to 0 means all energy is dissipated upon impact and close to 1 means nearly all energy is retained by the ball. All materials have a different co-efficient depending on the make up of the ball and the surface 	

- b) Referring to the table above, discuss which coloured squash ball you would recommend for elite squash players and novice squash players and why. (10 marks)

Two marks for recommendation	
<ul style="list-style-type: none"> Elite players the yellow dot. Novice players the blue dot 	1 mark each
Eight marks for reasons why	
<ul style="list-style-type: none"> Blue dot ball has highest coefficient of restitution so it will bounce the highest. Novice players benefit from high bounce as it gives them time to get into position and play a shot Do not have to hit the ball as hard to get a good rebound, easier to serve behind the line, easier to rally Yellow dot has the lowest coefficient of restitution so ball will bounce lower. Low bounce is harder to hit as less time to react and move to the ball Need to hit the yellow dot ball really hard to get good rebound so hard to serve and hard to rally Novice players should progress through the balls in order as they improve so begin with blue and then go red, then white, then yellow. 	Up to 2 marks per point

[illegible]

PE Studies Stage 3, 2015 – ACHPER WA

PE Studies Stage 3, 2015 – ACHPER WA

Acknowledgements

Australian Institute of Health and Welfare 2014. Australia's health 2014: in brief. Cat. no. AUS 181. Canberra: AIHW

Mitchell A, Patrick K, Heywood W, Blackman P, Pitts M. 2014. 5th National Survey of Australian Secondary Students and Sexual Health 2013, (ARCSHS Monograph Series No. 97), Australian Research Centre in Sex, Health and Society, La Trobe University, Melbourne, Australia.

National Drug Strategy 2010–2015, A framework for action on alcohol, tobacco and other drugs. Commonwealth of Australia 2011.

Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation, <http://www.westerndeserthdialysis.com/> {accessed August 2015}

World Health Organisation, <http://www.who.int/> {accessed August 2015}