

General Certificate of Education (A-level)
June 2013

Physical Education

PHED3

(Specification 2580)

Unit 3: Optimising performance and evaluating contemporary issues within sport

Final

Mark Scheme

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Section A

Question 1

In 2012, Jessica Ennis won the Olympic Heptathlon title, which involved running, throwing and jumping over two days of competition, as shown in Figures 1, 2 and 3.

To maximise performance during competition, a performer must develop their flexibility and ensure that their body maintains the correct water and electrolyte balance.

Explain how a performer uses proprioceptive neuromuscular facilitation (PNF) to increase flexibility, and outline the physiological changes that will occur if the correct water and electrolyte balance is not maintained.

(14 marks)

Technique/method

- A. Can be passive/active
- B. Usually involves partner helping
- C. Stretch target muscles to limit/full range of movement/ROM
- D. Hold (stretched) position for a few seconds
- E. Contract muscle group isometrically
 F. Muscles relax
- G. Stretch target muscles again
- H. CRAC (contract/relax/antagonist/contract)

Physiological explanation (during stretching)

- I. Muscle spindles detect changes in muscle (fibres)
- J. Cause stretch reflex
- K. Designed to prevent overstretching/protective
- L. (Aim of PNF) to override the stretch reflex
- M. Golgi Tendon organs/GTO activated/detect overstretching of
- N. (causes) Muscles relax/autogenic inhibition
- O. Allows greater range of movement than the initial stretch/greater range of movement in the training session

Water and electrolyte balance - Dehydration

- P. Blood thickens/increase in viscosity
- Q. Increase in heart rate/heart has to work harder
- R. Reduction in blood flow to working muscles/less oxygen to the muscles
- S. Blood flow to skin reduces/increase in body temperature/heat stroke/unable to maintain correct body temperature
- T. Slows reaction time/decision making/slows nerve impulses
- U. Muscle fatigue
- V. Muscle cramps
- W. Irregular heart beat
- X. Disruption to removal of waste products/lactic acid build up

D. accept up to 30 seconds

- M. The term 'Golgi Tendon' okay with suitable explanation
- F & N. can only be credited if used in correct context
- N. Do NOT accept reciprocal inhibition O. not just increases
- flexibility

W. Refers to change of heart patterns/rhythm, not just increase in heart rate

24 point mark scheme

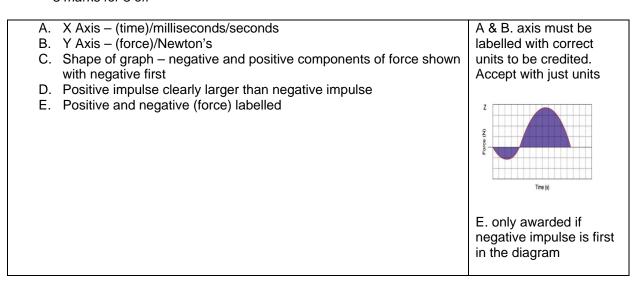
Band Range	Band descriptors	
Level 4 12-14 mks	 Addresses all areas of the question, demonstrates a wide range of depth and knowledge Expresses arguments clearly and concisely Few errors in spelling, punctuation and grammar, correct use of technical language 	16/17/18 points – 12 marks 19+ points = 13 marks + written Quality max 14 marks
Level 3 8-11 mks	 Addresses most areas of the question, demonstrates a clear level of depth and knowledge Attempts to express arguments clearly and concisely Few errors in spelling, punctuation and grammar, correct use of technical language although sometimes inaccurately 	11/12 points – 8 marks 13/14 points – 9 marks 15 points – 10 marks + written quality max 11 marks
Level 2 4-7 mks	 Addresses some aspects of the question but lacks sufficient depth and knowledge Limited attempt to develop any arguments or discussions, normally vague or irrelevant Errors in spelling, punctuation and grammar, limited use of technical language 	6/7 points – 4 marks 8/9 points – 5 marks 10 points – 6 marks + written quality max 7 marks
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Level 0 0 mks	Addresses no aspect of the question	

Question 2

Heptathletes are required to complete the 200 metre sprint, as shown in Figure1.

A 200 metre runner must exert a large force in a short period of time to generate an impulse. Sketch and label a graph to show the impulse generated during the acceleration phase of a 200 metre race.

(3 marks)



With reference to the Sliding Filament Hypothesis, explain the roles of tropomyosin and troponin during muscles contraction. (4 marks)

4 marks for 4 of:

Α.	I ropomyosin prevents myosin attaching to actin filaments	preparing the binding
B.	Nerve impulse/electrical impulse/action potential	site' too vague
C.	Releases calcium ions (from sarcoplasmic reticulum)	_
D.	(Calcium ions) attach to troponin (on actin filaments)	
E.	Causing shape of troponin to alter/moves out of the way	
F.	Tropomyosin binds to actin/winds around/neutralises the troponin	
G.	Exposes myosin binding site (on actin filament)	
H.	Allows myosin to bind to actin/cross-bridges formed	

Question 3

One event in the heptathlon is the shot put, as shown in **Figure 2**. This involves one powerful, explosive movement.

04 Name **three** factors that affect the distance the shot travels.

(1 mark)

A. Height, Speed and Angle of release	All 3 must be named
	correctly
	Accept velocity for
	speed

- Copy **Figure 4** and label your diagram to show the changing vertical and horizontal vectors at the following points:
 - the point of release
 - the highest point of flight
 - the point immediately before landing.

(3 marks)

Point of release	Arrows only required on
A. Positive vertical component	diagram
Highest point	Specific points of flight
B. No vertical component	path do not need to be
Before landing	identified
C. Negative vertical component	
D. Equal horizontal component at all three points in flight	
B. Equal nonzonial component at all times points in high	
Vector arrows must be present and attached to the correct point on the parabolic curve	
↑	
\bigvee	

06 Explain how energy is provided, allowing the athlete to complete the shot put. (3 marks)

3 marks for 3 of

Α.	Stored ATP	Do not accept
В.	Alactic system/ATP-PC system/Phosphocreatine system/ATP-CP	'alactacid system'
	system	'anaerobic system
C.	PC breakdown	Equations must be
D.	To creatine and phosphate/C and P	explained
E.	Energy used/released to perform the contraction/re-synthesis for	E. Must be linked to
	ATP	point C or D

Question 4

Athletes must have sufficient energy stores to compete and perform in a variety of weather conditions.

07 Identify the energy sources that a performer may use during competition. (3 marks)

3 marks for 3 of:

A.	Carbohydrates/Glucose/Glycogen	
B.	Protein/Lactate/Amino acids	
C.	Fats/Fatty acids/Glycerol/Triglycerides	
D.	Creatine/phosphocreatine	

Thermoregulation is essential in maintaining the correct body temperature.

08 Explain how thermoregulation is achieved by the body during exercise. (4 marks)

A.	Thermoreceptors – detect temperature changes and send	Must explain the
	messages	function/role of the
B.	<u>Thermoregulatory centre/medulla/hypothalamus</u> – receives	physiological term
	messages/controls temperature	
C.	<u>Vasodilation</u> – opening of blood vessels/blood closer to skin	No marks for naming
D.	Radiation – heat lost by infrared rays/no physical contact needed	term only
E.	Conduction – heat lost from (skin) to object/air	
F.	Convection – heat lost by movement of gases/air	
G.		
H.	Heat retention – hairs raised/shivering/piloerection	H & I. context of answer
I.	<u>Vasoconstriction</u> – closing of blood vessels/skin capillaries	must relate to cold
		conditions

Section B

Question 5

Sporting contests require the performer's full commitment, both physically and psychologically. The performance of some individuals can be hindered by over-arousal.

09 Explain, using appropriate psychological theories, the possible causes of aggressive behaviour during sporting contests **and** suggest strategies a coach could use to develop the assertive behaviour of a performer. (14 marks)

Theories of Aggression Theory must be A. <u>Instinct</u> (Theory)/<u>Trait</u> (Theory) correctly named to be B. Aggression is innate/born with aggressive traits credited with marks C. Aggression builds up and has to be released D. Displacement theory/individuals wait for acceptable time to be aggressive, eg sport E. Cathartic effect/catharsis E. 'stress relief' too F. Frustration-Aggression (Hypothesis/theory) vaque G. Blocked goal causes frustration F. Frustration-H. Frustration causes aggression Aggression Hypothesis I. Release of aggression has cathartic effect/catharsis must be named in full, J. Aggressive Cue (Hypothesis)/Cue Arousal (Theory) NOT FA hypothesis K. Frustration builds but aggression only released when socially H. can only be awarded desirable cue present, eg referee can't see you/coach encourages if correct context of a you to be aggressive goal being blocked is L. Social Learning (Theory) included M. Aggression in learnt by observing and copying others/Vicarious experience N. Reinforcement causes behaviour to be repeated/or appropriate applied example Strategies to develop assertive behaviour O. Punish aggressive acts/fine player/drop for next match or equiv P. Develop player's code of conduct/promote fair play Q. Remove from situation/change position/substitution/change tactics R. Encourage peer support/group pressure Answers should focus S. Give role of responsibility/set performance goals/process goals on strategies the coach T. Highlight non-aggressive/positive role models could use, not officials, U. Reduce importance of event/avoid 'win at all cost' attitude NGBs or the individual V. Stress management techniques/accept named examples P. focus is on W. Rewards/positive reinforcement for assertive play encouraging non-X. Develop fitness levels aggressive behaviour

W. focus is on rewarding

non-aggressive behaviour

24 point mark scheme

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Level 0 0 mks	Addresses no aspect of the question	

Question 6

Elite performers have to develop high levels of self-confidence to optimise their performance.

10 What do you understand by the term learned helplessness?

(3 marks)

A.	Performer perceives failure is inevitable/only option	
B.	No control over the situation	
C.	Causes avoidance behaviour/no task persistence/giving up is the only option/lack of effort	
D.	Caused by attributing failure to ability/internal stable factors	D. 'incorrect attributes'
E.	Global/general learned helplessness – general sporting situations,	too vague
	eg not good at water sports	E & F. must be
F.	<u>Specific/Situational learned helplessness</u> – specific situations, eg not good at diving in the pool	explained

11 Explain how the self-efficacy of a performer may be improved.

(4 marks)

4 marks for 4 of:

Α.	A. Performance accomplishments/success from previous				
	performances/reminding performer of previous success/or equiv				

- B. Avoid failure this can hinder self-efficacy
- Organise successful events/gradually increase task difficulty/make task easier
- D. Vicarious experiences/watching successful performances
- E. More effective if performers are of similar ability
- F. Verbal persuasion/encouragement/positive feedback/reinforcement from coach
- G. Emotional arousal/stress management techniques/mental rehearsal/establish set routines
- H. Set goals/targets/performance goals rather than outcome goals
- I. Avoid social comparison with other performers
- J. Use attributions correctly/attribution retraining/encouraging selfserving bias

The use of the terms from Bandura's model must be used in the context of improving self-efficacy to be credited with marks

- C. 'practice' too vague
- F. 'rewards' too vague

Question 7

The performer and the coach must work together so that the performer can control their arousal levels during a competition.

12 Identify **three** characteristics of the peak flow experience.

(3 marks)

3 marks for 3 of:

Α.	Highly focussed on the task/good selective attention/fully absorbed/
	involved in activity

- B. Movement or skill feels effortless/physical and mental harmony
- C. Clear goals
- D. High levels of confidence/self-efficacy/sense of well being
- E. Sub-conscious feelings of control/being on autopilot/ automatic/ optimal levels of arousal/zone of optimal functioning/ZOF

E. 'in the zone' too vague – needs link to correct arousal levels

When quality of performance and levels of satisfaction are high, optimal levels of arousal are more likely.

Use **Figure 5** to explain how a coach can help the performer to reach optimal levels of arousal. (4 marks)

4 marks for 4 of:

A. <u>Si</u>	tuation,	performer	and	<u>leader</u>	<u>characteristics</u>	must be	considered
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- B. (Required behaviour) determined by the situation
- C. (Preferred behaviour) the performer's ideal behaviour of the leader
- D. (Actual leader behaviour) the leader's action towards the performer
- E. The closer the leader's behaviour is to that expected by performer the greater chance of optimal arousal/performance will be of a high quality/levels of satisfaction
- F. Having all three behaviours matching is the ideal

E. Refers to link between leader and group only, not the task

Question 8

Many elite performers complete personality and anxiety tests as part of their preparation for competition.

Name **one** self-report questionnaire often used to measure anxiety **and** outline the disadvantages of using this form of data collection. (3 marks)

3 marks for 3 of:

Named test		Accept first answer only
A.	Sport Competition Anxiety Test/SCAT	for named questionnaire
B.	State Trait Anxiety Inventory/STAI	
C.	Competitive Sport Anxiety Inventory/CSAI-2	Sub-max of 1 mark for
Disadv	rantages	named test
D.	Misinterpretation of questions/lack of understanding	
E.	Answers may not be truthful/provide socially desirable answers	
F.	Questions may not allow for full answers/limited options to express	
	emotions	
	Inappropriate questions/biased questions	
H.	Situation when completed may not be ideal/may rush to complete	H. Do NOT accept 'time
	questionnaire	consuming'

How can knowledge of the interactionist theory of personality help a coach to improve the performance of an individual player? (4 marks)

Explan	ation of theory	Sub max of 3 marks
Α.	(Explanation of Interactionist Theory) – mixture of personality <u>traits</u> and the situation/trait theory <u>and</u> social learning theory	D, E, F. No explanation
B.	Behaviour can alter in different situations	required
C.	(Lewin) – Behaviour = function(Personality x Environment) / B=f(PE)	D, E, F. Accept
D.	Psychological core/inner core is fairly permanent beliefs and values	annotated diagrams for
E.	Typical response/middle layer is usual behaviour in a given situation	Hollander's model No mark for just naming
F.	Role-related behaviour/specific behaviour in a certain situation	Hollander
Applic	ation of theory	
G.	Theories suggest performers can be taught to alter their behaviour and improve performance/teach performer to act in certain ways in specific circumstances/learn how to respond to a specific situation	
H.	Coach identifies aspects of personality or behaviour to be changed	
I.	Creates situations or experiences to cause a change of behaviour/	
	eg teach aggressive player to be assertive/introvert performer not to	
	become over-aroused in front of a crowd	
J.	Coach identifies a suitable situation to avoid specific aspects of	
	personality being displayed, eg move position to avoid aggressive	
	behaviour	

Section C

Question 9

The modern Olympic Games have changed in nature and size since Baron Pierre de Coubertin organised the 1896 Athens Games, which involved only amateur performers competing in nine sports.

Explain the social factors **and** the support programmes in the UK that encourage the development of elite athletes and increase the chance of winning medals. (14 marks)

	Status of sport/level of media coverage	Any organisation that is
B.	Equal opportunities policies/anti-discrimination policies	named has to have
	School/university experience	some description of
	Club network/access to clubs	what they do
E.	Parental/family/peer support	
F.	Socio-economic status/social class	
G.	(Funding) – private/scholarships/sponsorships or equiv/Sport Aid	G & H. 'funding' too
H.	(Funding) – public/lottery/local authority or equiv.	vague
I.	Sport England – coordinated development of grass roots/	G & H. refers to source
	participation	of funding, not
J.	UK Sport coordinates development of elite sport/provide support	distribution of funding
	services	
K.	Co-ordinated approach of sports organisations/work together (UK	K. Two organisations
	Sport, Sport England, NGBs, EIS, BOA, Sports Coach UK, UKSI)	must be named to be
L.	Whole Sport Plans	credited
M.	High quality facilities	
N.	High quality coaching	
Ο.	Talent identification programmes/TIPs/examples of TIPs, eg Girls	
	for Gold, Pitch to Podium	
	Levels of structured competition	
	Progression routes/district to county to region or equiv/LTAD	
R.	Research and development programmes	
S.	Sports science/biomechanics/sports psychology/nutritional advice/	
	strength and conditioning	
T.	Sports medicine/physiotherapy	
U.	World Class Performance Pathway/Programme	
V.	\	V. three stages to be
W.	Talented Athlete Scholarship Scheme/TASS/Athlete Personal	named
	Awards	
Χ.	Performance Lifestyle/ACE programme	

24 point mark scheme

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Question 10

The 19th century English public schools had a major impact on the development of rational recreation and the sporting values of the modern Olympic Games.

What are the similarities between the sporting values of the 19th century English public schools and the modern Olympic Games? (3 marks)

Both er	Both encourage;			
A.	Sportsmanship/respect for opponent/fairplay	Not – contract to		
	Athleticism/physical endeavour with moral integrity	compete' unless		
C.	Follow unwritten rules of the sport/etiquette/code of conduct	explained and relevant		
D.	Taking part is more important rather than winning/team loyalty as	links made		
	well as individual success			
	No monetary prizes/winning for the glory/amateurism	'Muscular Christianity' is		
F.	Self-discipline/maximum effort/high commitment level	irrelevant in this context		
G.	Natural ability – no drugs			

18 Explain how, during the 19th Century, ex-public school boys influenced the development of sport in the UK and around the world.

(4 marks)

4 marks for 4 of:

A.	Impact of universities/old boys network <u>led to</u> codification/rules and regulations/clubs	Must have attempted to explain how they
В.	Establishment of governing bodies <u>led to</u> regular	influenced development
	competitions/leagues	not just state grouping
C.	Industrialists/employers developed factory teams/facilities	
D.	Clergy developed church clubs/teams/YMCA/Boys Brigade	
E.	Officers used sport with Armed services/troops	
F.	(Ex-public school boys) travelled the British Empire and introduced	
	new sports	F. Do NOT accept
G.	Philanthropists/social reformers <u>built</u> facilities/ <u>encouraged</u> social	travelled the world as it
	reform	is too vague
H.	Teachers/blues and some impact implied, eg taught sport	-
I.	Politicians introduced Acts of Parliament for public provision of	
	facilities	

Question 11

At the London 2012 Olympic Games, billions of people watched both amateurs and professionals competing in 26 sports.

Suggest reasons why the International Olympic Committee (IOC) has allowed professional performers to compete at the Olympic Games in recent years. (3 marks)

A.	Many traditional amateur sports are now professional	
B.	Blurring of amateur and professional status in many sports/difficult	
	to make clear distinction between 'true' amateur and others	
C.	Olympic Ideal maintained/correct sporting ethics	
D.	No prize/appearance money awarded	
E.	Amateurs can still compete	
F.	Higher standard of competition	
G.	Greater spectator/media interest	
H.	High levels of income/media rights/ticket prices	

20 Discuss the suggestion that the increased media coverage of elite sport has had a positive impact on coaches. (4 marks)

4 marks for 4 of:

Agree		Sub max of 2 marks per
A.	Greater profile/public awareness of their role	section
B.	Increased salary/job opportunities	
C.	Greater funding from media rights to develop players/team/squad/	Not just 'more money' –
	support systems	need to say how it can
D.	Easier to analyse opposition	be used
E.	Learn from other coaches	
Disagr	ee	
F.	Greater pressure/expected to produce results	
G.	Greater expectation to deal with media/answer questions/invasion	
	of privacy or equiv	
H.	Hire and fire culture/easier to lose job	
I.	Coaches at clubs/sports with less coverage have less funding	
J.	Coaches at clubs/sports with less coverage find it harder to attract	
	performers	
K.	Media allows opposition access to team tactics	

Question 12

There have been many examples of deviancy throughout the history of the modern Olympic Games, even though all performers agree to the Olympic Oath.

21 Explain the terms positive deviancy and negative deviancy. Use practical examples to support your answer. (3 marks)

3 marks for 3 of:

A.	(Negative Deviancy) – Behaviour against societies norms and values/against sporting ethic/sub-normal behaviour	
B.	Example – intentionally breaking the rules/fouling another player/	B. NOT gamesmanship
	doping/violence/match fixing	
C.	(Positive Deviancy) – Over conformity to sporting ethic	
D.	Example – over training/competing with an injury/over commitment	
	to win and unintentionally injures another player	

Suggest reasons why there have been very few instances of spectator violence at the modern Olympic Games compared to some other major sporting events. (4 marks)

	Olympics only once every 4 years	Not 'high levels of
B.	Crowds from many countries/less intense rivalry	security'
C.	Fairplay/international understanding encouraged/Olympic ideal	
	actively promoted	D. Accept equivalent
D.	Less media <u>hype</u> to incite crowd	words to hype/incite,
E.	Family orientated	NOT just media hype
F.	Alcohol drinking culture not usual	
G.	Less pre-arranged organised violence	
H.	Behaviour of performers does not deliberately incite opposition	
	supporters	
l.	Multi-sport competition	