

SPECIMEN

Advanced Subsidiary GCE

PHYSICAL EDUCATION

G451

Unit G451: An introduction to Physical Education

Specimen Paper

Time: 2 hours

Morning/Afternoon

Additional Materials: Answer Booklet (8 pages)



INSTRUCTIONS TO CANDIDATES

- There are three Sections in this paper.
- Answer all parts of the question in each of Sections A, B and C

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [1] at the end of each question or part of question.
- The total number of marks for this paper is 90.

ADVICE TO CANDIDATES

• Read each question carefully and make sure you know what you have to do before starting your answer.

QUALITY OF WRITTEN COMMUNICATION

The quality of your written communication will be assessed in questions that are indicated accordingly (*). Marks will be awarded for spelling, punctuation and grammar, use of appropriate form and style of writing, and for organising work clearly and coherently.

This document consists of 4 printed pages.

SP (SLM) T12103 © OCR 2007 [QAN 500/2591/0]

OCR is an exempt Charity

[Turn Over

Section A

Answer all parts of the question.

Anatomy and Physiology

Question 1

a. In terms of fibre type, the composition of muscle is largely genetically determined and can influence the activities in which people participate.

Identify **two** structural and **two** functional characteristics of a slow oxidative muscle fibre.

If a person has a high percentage of slow oxidative fibres what type of physical activity are they more likely to participate in? [5]

- Explain how neural control of the heart helps to maintain the supply of oxygenated blood during exercise.
- **c.** The skeletal pump mechanism is one way of helping to maintain venous return.

Describe three other mechanisms involved in venous return.

Explain the importance of the skeletal pump mechanism during an active cool-down. [5]

d. Use the information in Fig. 1 to help explain the difficulties that an endurance performer might experience when performing at altitude without a period of acclimatisation. [5]

Altitude (height in metres)	Atmospheric pressure (mmHg)	Partial pressure oxygen (mmHg)
Sea level	760	159.2
2,000	596	124.9
4,000	462	96.9

Fig. 1

e.* Taking part in physical activity is considered essential to maintaining a healthy lifestyle. However, taking part in some activities can result in injury and a reduction in activity levels.

Discuss **both** the positive and the negative impact of participating in different types of physical activity on the joints and muscles of the body. [10]

Section A Total [30]

Section B

Answer all parts of the question.

Acquiring Movement Skills

Question 2

a. Developing movement or motor skills is important if you wish to follow a balanced, active and healthy lifestyle.

Describe what is meant by gross, fine, open, closed, high organisation and low organisation movement skills.

Use examples of motor skills to support your answer.

[6]

b. Abilities often affect participation and performance in physical activities

Identify the characteristics of abilities.

Give examples of a gross motor ability and a psychomotor ability

[5]

c. Identify two different mechanical products for movement skill learning.

Give reasons for the use of these mechanical products to guide a learner of a motor skill.

[5]

d. Why is it important to develop a quick reaction time when performing movement skills?

What factors could affect response time in physical activities?

[4]

e.* Arousal is seen as the amount of drive that we have. Arousal can affect our levels of motivation when participating in physical activities as part of a balanced, active and healthy lifestyle.

Compare and contrast drive theory, inverted U theory and catastrophe theory as explanations for the relationship between arousal and performance of motor skills. [10]

Section B Total [30]

Section C

Answer all parts of the question.

Socio-Cultural Studies relating to participation in physical activity

Question 3

- a. Identify possible benefits to young people of regular participation in Outdoor Education activities such as canoeing, orienteering or hill walking as part of their Physical Education programme. [4]
- **b.** The media can have both positive and negative effects on sport.

Outline **both** positive and negative effects of the media on sport.

[6]

c. Identify possible benefits of hosting the 2012 summer Olympic Games in Britain.

[5]

- **d.** Give reasons for physical activity (physical education, physical recreation and sport) being of such high status in Australia. [5]
- e.* Discuss factors that can influence young people's participation in the following aspects of physical activity: sport and physical recreation. [10]

Section C Total [30]

Paper Total [90]

Copyright Acknowledgements:

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (OCR) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest opportunity.

OCR is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© OCR 2007



SP (SLM) T12103

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE

PHYSICAL EDUCATION

G451 MS

Unit G451: An Introduction to Physical Education

Specimen Mark Scheme

The maximum mark for this paper is 90.

QUALITY OF WRITTEN COMMUNICATION

Quality of written communication is assessed in questions that are indicated accordingly (*). Marks should be awarded for spelling, punctuation and grammar, use of appropriate form and style of writing, and for organising work clearly and coherently.

This document consists of 15 printed pages.

© OCR 2007 [QAN 500/2591/0] OCR is an exempt Charity [Turn Over

Section A	- Anatomy and Physiology	
Question Number	Answer	Marks
1(a)	Identify two structural and two functional characteristics of a slow oxidative muscle fibre. If a person has a high percentage of slow oxidative fibres what type of physical activity are they more likely to participate in?	
	Fibre type 1 mark per point max 2 structural characteristics: • fewer fibres per motor neurone; • more myoglobin; • more mitochondria; • more fat stores; • type of myosin ATPase (slow); • smaller in diameter. 1 mark per point max 2 functional characteristics: • high aerobic capacity/low anaerobic capacity; • slow contractile speed; • high fatigue resistance;	
	 low motor unit strength. 1 mark per type of physical activity: any related endurance type activity. 	[5]
1(b)	Explain how neural control of the heart helps to maintain the supply of oxygenated blood during exercise. 1 mark per point max 5: Neural control of heart • movement detected by proprioceptors in the muscles; • increase in carbon dioxide and lactic acid detected by chemoreceptors; • changes in blood pressure detected by baroreceptors; • sends information to the cardiac control centre; • in the medulla oblongata; • receptors indicate a need to increase oxygen supply/get rid of waste products; • medulla oblongata responds by increasing activity of sympathetic nerve;	
	 decreasing activity of parasympathetic nerve; increased stimulation of S.A. node; resulting in increase in heart rate. 	[5]

	- Anatomy and Physiology	
Question Number	Answer	Marks
1(c)	Describe three other mechanisms involved in venous return.	
	Explain the importance of the skeletal pump mechanism during an active cool-down.	
	Skeletal pump mechanism.	
	1 mark per point max 3:	
	 valves in the veins allows blood to travel in one direction only - back to the heart; 	
	 respiratory pump mechanism. Pressure/volume changes in thoracic cavity during breathing puts pressure on the abdominal veins moving blood back to the heart; 	
	 venoconstriction of veins/venomotor tone. Smooth muscle in the vessel walls helps to move blood back to the heart; 	
	 gravity moves blood from areas of the body that are above the heart. 	
	1 mark per point max 2 for importance of maintaining the skeletal pump mechanism:	
	 contracting muscles squeeze walls of blood vessels forcing blood back to the heart; 	
	 prevents blood pooling/sudden drop in blood pressure; 	
	helps remove waste products/carbon dioxide/lactic acid.	[5]
1(d)	Use the information in fig 1. to help explain the difficulties that an endurance performer might experience when performing at altitude without a period of acclimatisation.	
	1 mark per point max 5:	
	Endurance performer at altitude.	
	 % of oxygen within the air remains the same at sea level and altitude; 	
	 pp oxygen drops as altitude increases; 	
	 diffusion gradient between air and lungs is reduced at altitude; 	
	 need to increase rate/depth of breathing at altitude; 	
	 at altitude the diffusion gradient between the alveoli and blood is reduced/pp oxygen in lungs at altitude is lower than pp oxygen in lungs at sea level; 	
	at altitude not as much oxygen moves from alveoli into the blood;	
	 as a result haemoglobin is not fully saturated/reduced oxygen carrying capacity of the blood; 	
	at altitude not as much oxygen is delivered to the working muscles;	
	aerobic performance deteriorates.	[5]

Section A - Anatomy and Physiology

Question Number	Answer	Marks
	th the positive and the negative impact of participating in pes of physical activity on the joints and muscles of the	
L2 5-7 marks	 There is detailed knowledge and good understanding of the topic. There is effective analysis and/or critical evaluation. Knowledge has been clearly and consistently linked to practical performance throughout the answer if appropriate. Accurate technical and specialist vocabulary is used throughout. There is a high standard of written communication. Discriminators from L2 are likely to include: Clear understanding of how exercise can improve the strength of both bone and muscle; A full understanding of how growth plate injuries can occur; Detailed links are made between the structure of a joint and the demands of an activity (both negative and positive); Knowledge of the impact of flexibility and or speed/agility work on joints and muscles. There is satisfactory knowledge and understanding of the topic. Analysis and/or critical evaluation is attempted with some success. Knowledge has been linked to practical performance with some success where appropriate. Technical and specialist vocabulary is used with some accuracy. Written communication is generally fluent with few errors. Discriminators from L1 are likely to include: A knowledge of how exercise can improve the strength of bone and/or muscle; An awareness of how growth plate injuries can occur; A clear link is made between the structure of a joint and the demands of an activity (can be negative or positive). 	

Question Answer Number	Marks
1(e)* cont'd 1	
Indicative content: Positive impact Low impact, endurance activities • bones stronger/more calcium deposits; • varies line of stress on bone. Strength/core stability • hypertrophy of muscles; • increased strength of muscle; • leads to increase in stability of joints e.g. increase strength in rotator cuff muscles stabilizes shoulder joint, increase strength in quads helps stabilize shoulder joint, increase strength in quads helps stabilize tracking and knee function; • increased core stability reduces likelihood of problems with lumbar vertebrae. Flexibility • maintain range of movement round joint; • joints mobilised/lubricated by synovial fluid. Speed/agility • muscles retain more elasticity/elastin therefore retain more speed/power. Negative impact Impact activities either from contact or landing • damage to immature bones/growth plate; • muscle damage due to excessive eccentric contractions; side impact on hinge joints leading to ligaments of knee joint; • impact on shoulder joint e.g. head of humerus sits in shallow depression therefore is easily dislocated. Extreme flexibility • stretch ligaments leading to lack of stability. Repetitive movements/over use • wearing down of articular/hyaline cartilage in joints e.g. hinge joint of ankle and repetitive plantarflexion, striking of ball; • inflammation of bursa; • increased strength of muscle; • impact on hinge joints leading to lack of stability • stretch ligaments leading to lack of stability. Repetitive movements/over use • wearing down of articular/hyaline cartilage in joints e.g. hinge joint of ankle and repetitive plantarflexion, striking of ball; • inflammation of bursa;	[10]
Section A Total	[30]

Question Number	Answer	Marks
2(a)	Describe what is meant by gross, fine, open, closed, high organisation and low organisation movement skills.	
	Use examples of motor skills to support your answer.	
	1 mark per point max 6:	
	(Each must be accompanied by a suitable practical example)	
	 (gross) large muscle movements/dynamic/ballistic movements; 	
	 (fine) small muscle movements/intricate movements; 	
	 (open) affected by the environment/predominantly perceptual/ externally paced; 	
	 (closed) not affected by the environment/predominantly habitual/open loop movement/internally paced; 	
	 (high organisation) continuous/one sub routine becomes the beginning of the next/cannot be split into parts/sub-routines easily; 	
	 (low organisation) serial/easily split into sub-routines/made up of separate discrete elements. 	[6]
2(b)	Identify the characteristics of abilities.	
	Give examples of a gross motor ability and a psychomotor ability.	
	1 mark per point max 5:	
	innate/genetic/natural/born with them;	
	enduring/stable/underlying/a potential;	
	specific (to groups of movements); ("""""""""""""""""""""""""""""""""""	
	(gross motor ability) speed/power/flexibility/endurance etc;	
	 (psychomotor ability) decision making/reaction time/hand-eye co- ordination/spatial awareness etc. 	[5]
2(c)	Identify <u>two</u> different mechanical products for movement skill learning.	
	Give reasons for the use of these mechanical products to guide a learner of a motor skill.	
	1 mark per point max 2:	
	 Any 2 examples of 'mechanical' aids for learning e.g. twisting belt in trampolining. Arm bands in swimming. Stabilisers on a bicycle etc; 	
	1 mark per point max 3:	
	gives confidence to learner;	
	provides safety;	
	 enables success/builds up sub-routines/enables part-learning; 	
	gives an idea of the activity/similar kinesthesis.	[5]

Section B - Acquiring Movement Skills		
Question Number	Question Number	Marks
2(d)	Why is it important to develop a quick reaction time when performing movement skills?	
	What factors could affect response time in physical activities?	
	1 mark for:	
	(important to develop quick reactions) to produce skilled movement at speed/to outwit your opponent/to get away from opponents/to get a good start/to improve overall speed/to be able to cope with situation effectively.	
	1 mark per point max 3:	
	number of stimuli/number of possible alternative responses/number of decisions to be made/open/complex/externally-paced skills/psychological refractory period/single channel hypothesis;	
	distractions/ability to selectively attend/focus/spectator distractions/social inhibition;	
	age/gender;	
	level of personal fitness/health/somatotype/length of neural pathways;	
	past experience/presence of motor programmes/level of skill/ability;	
	relevant environmental factors not covered by the above.	[4]

Section B	3 - Acquiring Movement Skills		
Question Number		Answer	Marks
2(e)*	Compare and contrast drive theory, inverted U theory and catastrophe theory as explanations for the relationship between arousal and performance of motor skills.		
	L3	 There is detailed knowledge and good understanding of the topic. There is effective comparison and contrasting and/or 	
	8-10 marks	 critical evaluation. Knowledge is clearly and consistently linked to practical performance throughout the answer if appropriate. Accurate technical and specialist vocabulary is used throughout. There is a high standard of written communication. 	
		Discriminators from L2 are likely to include: Understanding of the term dominant response; Detailed knowledge of catastrophe theory; Good comparison/contrast of one or more relevant factors. 	
	L2	There is satisfactory knowledge and understanding of the topic.	
	5-7 marks	 Comparison and contrasting and/or critical evaluation is attempted with some success. Knowledge has been linked to practical performance with some success where appropriate. Technical and specialist vocabulary is used with some accuracy. Written communication is generally fluent with few errors. 	
		 Discriminators from L1 are likely to include: Explanation rather than mere description; Knowledge shown for at least two theories; There is satisfactory comparison/contrast of one or more relevant factors. 	
	L1 0-4 marks	 There is basic knowledge but little understanding of the topic. Little or no attempt to compare and contrast and/or evaluate critically. Little or no attempt to link knowledge to practical 	
	V-4 iliains	 Ettile of no attempt to link knowledge to practical performance. Technical and specialist vocabulary is used with limited success. Written communication lacks fluency and there will be errors, some of which may be intrusive. 	

Section B	- Acquiring Movement Skills	
Question Number	Answer	Marks
	Indicative content:	
	(Drive theory)	
	 graph showing linear relationship between arousal and performance, with axes labelled; 	
	performance increases as arousal increases;	
	dominant response is more likely to occur;	
	practical example;	
	 explains performance of ballistic/dynamic gross/closed skills – opposed to other theories; 	
	more likely with able performer opposed to other theories;	
	more motor programmes then more relevant;	
	 theory does not explain how elite performers decline under pressure/high arousal opposed to other theories. 	
	(Inverted U theory)	
	 graph (labelled) showing s-shaped curve with optimum point at moderate arousal and then a similar/steady decline in performance; 	
	 performance increases as arousal increases but only up to an optimum point/moderate arousal opposed to other theroies; 	
	performance decreases as arousal gets higher than moderate;	
	practical example;	
	 explains performance of games players/more complex/open skills opposed to other theories esp drive; 	
	the more able will be able to cope with more arousal;	
	less able will need lower levels of arousal;	
	increase and decrease never as smooth/steady as graph indicates;	
	graph includes variables including task/ability/personality;	
	 description of the Zone of optimal functioning (ZOF)/peak flow experience at optimum level of arousal. 	
	(Catastrophe theory)	
	graph (labelled) showing linear relationship between arousal and performance but a sudden decline in performance when arousal is high;	
	performance increases as arousal increases but suddenly/sharply decreases above moderate arousal opposed to other theories;	
	practical example;	
	 theory is about effects of different types of anxiety – other theories do not; 	

Section B	Section B - Acquiring Movement Skills			
Question Number	Answer			
2(e)* cont'd	 interaction of two types of anxiety – somatic and cognitive; performers reactions often dictated by cognitive anxiety; if somatic anxiety low and cognitive high then improves performance; if both high then can lead to a sudden/catastrophic effect opposed to other theories; graph shows performance resuming at level below previous optimum as arousal lowers; this is a multidimensional theory in contrast to the other two; it is a more realistic theory than other two, because it explains sudden decreases in performances of elite performers. 	[10]		
	Section B Total	[30]		

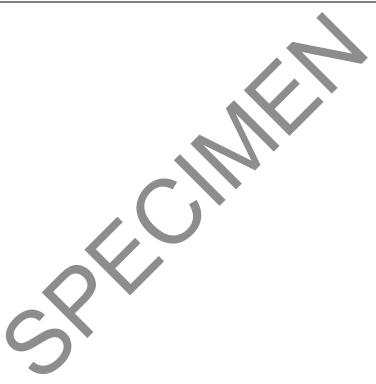
Section C	- Socio-Cultural Studies relating to participation in physical activity	ī
Question Number	Answer	Marks
3(a)	Identify possible benefits to young people of regular participation in Outdoor Education activities such as canoeing, orienteering or hill walking as part of their Physical Education programme.	
	1 mark per point max 4:	
	 appreciation of or respect for natural environment/awareness of conservation issues or pollution; 	
	 knowledge of safety or of how to minimise risk; 	
	 development of leadership skills; 	
	 development of decision making/problem solving skills; 	
	social skills/teamwork/communication skills;	
	 increased health/well being/fitness; 	
	 physical skills e.g. the skills of rock climbing. (a specific outdoor education skill must be identified); 	
	 increased well being or self esteem or confidence or mental strength or self awareness/a spiritual experience. 	[4]
3(b)	Outline both positive and negative effects of the media on sport. 1 mark per point max 6: Sub max of 3: Positive effects: • production of role models/copying of good behaviour/increased status of sport; • stereotypes can be shattered; • can increase participation; • can highlight minority sports and sports of minority groups;	
	 sport now part of entertainment industry/advertisements; 	
	 rules/timings/seasons/format/structure changed (in positive context). 	
	Negative effects:	
	 focus on trivial/sensational aspects/negative behaviour/negative role models; 	
	 stereotypes can be reinforced; 	
	 reduction in participation/a spectating society encouraged; 	
	 usually focuses on a few main sports/not minority sports/unequal coverage; 	
	 (if not given under positive influences above) rules/timings/seasons/format/structure changed (in negative context); 	
	 financial rewards only high at the very top/some performers may be forced to perform more frequently than is sensible or safe/decreased gate receipts. 	[6]

Section C	- Socio-Cultural Studies relating to participation in physical activity		
Question Number	Answer	Marks	
3(c)	Identify possible benefits of hosting the 2012 summer Olympic Games in Britain. 5 marks for five of: Benefits to Britain as whole:		
	 Increased participation in sport and physical activities due to: Olympic Games inspiring young people to take up sport / role models / media coverage / encouragement on children's TV / campaigns or competitions in schools / Sport England and other home country council campaigns associated with the Games / campaigns by other sports organisations e.g. National Governing Bodies of Sport Health, fitness or well being improved due to participation Feel good factor. Improved communications or transport system or road and rail network Tourism increased / income from tourism New businesses created / business profit. 		
	Benefits to Sport:		
	increased funding for sport;		
	 Olympic standard facilities built/legacy of facilities/London left with training facilities or offices or sports science or sports medicine facilities; 		
	other facilities built or re-furbished throughout Britain;		
	higher profile for sport/young people given a goal to aim for;		
	host countries often win more medals than usual; Output Output District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string of District on a string result in the string resu		
	 organisation or administration of British sport improved/improved communication between sporting organisations. 		
	Benefits to Local Area:		
	London promoted for business;		
	 employment opportunities/job creation/skill development for local people; 		
	 regeneration of area/rejuvenation of deprived area; 		
	 for local community: reduction of crime rates/increased educational attainment/increased sense of belonging; 		
	 housing from 'Olympic village' left/housing left for new residential community/3,500 new housing units available; 		
	 increased social integration or increased co-operation through working on local projects. 	[5]	

Section C - Socio-Cultural Studies relating to participation in physical activity						
Question Number	Answer					
3(d)	Give reasons for physical activity (physical education, physical recreation and sport) being of such high status in Australia. 1 mark per point max 5: Government support/high government funding; Australia is a health conscious society/outdoor lifestyle; promotion of 'feel good' factor; favourable climate; sport and physical education have high status in schools; tradition of success and/or participation in Australia; sport a way for Australia to express itself or to advertise itself; media support and interest in sport; Australia is an egalitarian society where sport was and is for all/opportunity, provision and esteem less of an issue than in UK; international sporting success is proof of progress for Australia; sporting success unites the nation or small population. Discuss factors that can influence young people's participation in the following aspects of physical activity: sport and physical recreation. L3 There is detailed knowledge and good understanding of the topic. There is a high standard of written communication. Discriminators from L2 are likely to include: Qualitative comments Independent opinion and examples There is satisfactory knowledge and understanding of the topic. Analysis (one or more relevant factors) and/or critical evaluation is attempted with some success. Knowledge has been linked to practical performance with some success where appropriate. Written communication is generally fluent with few errors.	[5]				
	Discriminators from L1 are likely to include: • The number of points made by candidates / greater breadth • Examples					

Question Number	Answer				
Number	L1 0-4 marks	topic. Little of factors Little of perform Written	is basic knowledge but little understanding of the or no attempt to analyse (one or more relevant s) and/or evaluate critically. Or no attempt to link knowledge to practical mance. In communication lacks fluency and there will be some of which may be intrusive.		
	Indicative cor	ntent:			
	 Equipmer 	nt/facilities	Local availability or personal possession of.		
	2. Coaching		Availability of coaches or coaching locally.		
	3. Your scho	ool	Status of PE in your school/some schools have better or worse provision/attending a sports college or independent school may increase participation/time available for sport and PE affects participation.		
	4. Where yo	u live	Geographical location affects choices and opportunities/access to specialist facilities/not enough space.		
	5. Choice		An individual may not like the activities that are on offer locally.		
	6. Friends/p	eer group	Peer group opinions about participation are usually significant/peer pressure.		
	7. Family		Significance of family members as role models/encouragement from early age.		
	8. Money		Availability of money or family income will increase or restrictions participation/presence or absence of discount schemes locally.		
	9. Social cla	SS	Restrictions or opportunities for access due to real or perceived constraints e.g. to a polo club or private tennis club or golf club.		
	10. Time		Individuals may have pressures on their time e.g. studies or part time work or family commitments.		
	11. Ability/ski	ll level	An individual may not be good enough to join a local private club or join in with an available group/disability.		
	12. Access		Social access/may or may not fit in/physical access e.g. for young people with disabilities.		
	13. Transport	:	Opportunities within walking distance or bus route or family support for lifts.		

Question Number	Answer		
	14. Esteem	Feelings of self esteem can both limit or increase the likelihood of participation/suitable examples should be credited.	
	15. Race or religion	Some ethnic groups have negative attitudes towards sport/e.g. Asian girls may not take part due to sub-cultural or values or personal reluctance.	
	16. Time	Individuals may have pressures on their time e.g. studies or part time work or family commitments.	[10]
		Section C Total	[30]
		Paper Total	[90]



Assessment Objectives Grid (includes QWC)

Question	AO1	AO2	AO3	Total
1(a)	4	0	1	5
1(b)	5	0	0	5
1(c)	5	0	0	5
1(d)	3	0	2	5
1(e)*	5	0	5	10
2(a)	6	0	0	6
2(b)	5	0	0	5
2(c)	4	0	1	5
2(d)	3	0	1	4
2(e)*	5	0	5	10
3(a)	4	0	0	4
3(b)	6	0	0	6
3(c)	5	0	0	5
3(d)	2	0	3	5
3(e)*	5	0	5	10
Totals	67	0	23	90