

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**GCE Advanced Level**

**MARK SCHEME for the October/November 2011 question paper  
for the guidance of teachers**

**9396 PHYSICAL EDUCATION**

**9396/33**

Paper 3 (Theory), maximum raw mark 90

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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**Section A**  
**Exercise and Sport Physiology**

**1 (a) (i) 4 marks from:**

- 1 the alactacid component occurs first
- 2 using some of the excess post exercise oxygen consumption
- 3 process restores the ATP / PC stores depleted during exercise
- 4 the energy for these reversible, endothermic reactions
- 5 is made available by the aerobic breakdown of fats and carbohydrate
- 6 the alactacid component takes between two and three minutes for full recovery
- 7 and uses up to 4 litres of oxygen / O<sub>2</sub> consumption remains high
- 8 it takes approximately 30 seconds to resynthesise 50% of PC stores
- 9 during this component the myoglobin oxygen stores are replenished

**(ii) 3 marks from:**

- 1 useful when planning interval sessions / reps and sets
- 2 for max speed work need to allow enough time for full recovery
- 3 for endurance work need to allow time for only partial recovery
- 4 50% of PC stores can be replenished in 30 secs
- 5 therefore making good use of time-outs / substitutions / full time allocation between games, etc. is important
- 6 during stoppage of play taking time e.g. injury / throw in / corner kick
- 7 changing tactics to lower intensity and gain recovery time

**(b) 4 marks in total**

**Sub max 1 mark for:**

VO<sub>2</sub> max is the maximal volume of oxygen that can be utilised in one minute during maximal exercise (measured in ml/kg/min) OR an identification of a valid test e.g. multistage fitness test.

**Sub max 3 marks for** description of appropriate aerobic test e.g. multi-stage fitness test)

- 1 progressive test to maximum
- 2 20 metre shuttle
- 3 time allocated to complete each shuttle
- 4 when performer cannot keep within test is stopped
- 5 level of shuttle reached will give a predicted VO<sub>2</sub> max score

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**(c) 7 marks from:**

**Alactic system**

- 1 the alactic energy system not appropriate as it has short threshold / small amounts of PC
- 2 the alactic energy system not appropriate as it only produces small amounts of ATP  
Lactic system
- 3 the lactic energy system / anaerobic glycolysis is not appropriate as it produces lactic acid
- 4 this eventually builds up/OBLA
- 5 causing fatigue
- 6 this system can only partially breakdown carbohydrate and cannot break down fat
- 7 there are only limited stores of carbohydrate
- 8 only produces limited amount of ATP / 2 ATP

**Aerobic system**

- 9 this system does not produce fatiguing by-products / carbon dioxide and water
- 10 this system can also breakdown fat
- 11 fat yields far more ATP per gram
- 12 the body has large stores of fat
- 13 this system can completely breakdown carbohydrate providing 36/38 ATP / high yield of ATP
- 14 can last a long time

**(d) 4 marks in total**

**Sub max 2 marks for mitochondria**

- 1 mitochondria is where aerobic metabolism takes place
- 2 therefore more food stores can be broken down aerobically / increase in oxygen consumption
- 3 producing far more ATP / energy for endurance work
- 4 increase in aerobic enzymes

**Sub max 2 marks for myoglobin**

- 4 myoglobin has an affinity for oxygen and is located in the cells
- 5 helps carry oxygen to the mitochondria therefore more oxygen available for aerobic respiration

**(e) (i) 4 marks in total**

**Sub max 1 mark for:**

- 1 calculated by weight divided by height squared

**Sub max 3 marks for:**

- 1 power based athletes will have small percentage of body fat
- 2 but will have large percentage of muscle tissue
- 3 muscle weighs (three times) more than fat (per unit of volume)
- 4 trained athletes are more likely to have a higher bone density
- 5 which means they have stronger bones and they weigh more
- 6 overall weight is distorted which makes the BMI inaccurate

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**(ii) 4 marks from:**

- 1 excess weight makes it more difficult to exercise as the body has to work harder to carry additional weight
- 2 contributes to CHD / heart attacks / heart problems
- 3 build up of low density lipoproteins (LDL) / high cholesterol
- 4 this can lead to development of fatty plaques in arteries (atherosclerosis)
- 5 raises risk of cancer
- 6 more likely to develop (type 2) diabetes as overweight people develop insulin resistance
- 7 diabetes / high blood glucose
- 8 develop fatty liver disease as fat accumulates round the liver leading to inflammation / liver disease
- 9 increases risk of hypertension / high blood pressure
- 10 arteries become partially blocked by fatty deposits / narrows lumen of artery / greater peripheral resistance
- 11 develop deep vein thrombosis
- 12 develop respiratory problems, breathlessness / sleep apnoea
- 13 back pain / immobility
- 14 joint degeneration/osteoarthritis
- 15 psychological problems

**[Total: 30]**

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**Section B**  
**Psychology of Sports Performance**

**2 (a) 5 marks for 5 from:**

**1 mark max for definition**

- 1 They are predispositions (towards an attitude object). / Mixture of cognitive / beliefs / **and** affective / feelings **and** behaviours / actions.

**4 marks max for influences:**

**4 marks for 4 from:**

- 2 positive attitudes (can) lead to more determined / positive behaviour / persistence in participation
- 3 negative attitudes (can) lead to less determination / negative (or examples of) behaviour / giving up easily
- 4 if you believe in the value of something you are more likely to be positive / if you do not believe then you are more likely to be negative
- 5 if you have desirable affective responses / emotions / you like what you do / see then you are more likely to have a positive / approach behaviour / if you have negative emotions more likely to have negative / dysfunctional behaviour
- 6 influenced more by role models' attitudes/perceived attitudes / those that you observe have high status then more likely to copy their attitudes
- 7 attitudes are affected by outcomes and the better the outcome the more positive the attitude / if successful / have positive outcomes more likely to have positive attitudes and therefore positive/approach behaviours

**(b) 4 marks for 4 from (max of 2 marks per theory):**

**(Trait)**

- 1 trait / genetic approach shows that we are born with our personality characteristics
- 2 traits are enduring / we express our personalities consistently
- 3 type A shows high levels of personal anxiety
- 4 type B shows low levels of personal anxiety

**(Interactionist)**

- 5 interactionist approach involves traits combining/interacting with the environment /  $B = f(P, E)$
- 6 when the situation changes – so does personality
- 7 the environment triggers / acts as a cue for the appearance of a trait

**(Social Learning)**

- 8 we learn/copy our personalities from others
- 9 if significant / role model then personality characteristics more likely to be copied / imitated
- 10 socialisation / early learning from parents / carers can affect the characteristics we copy
- 11 characteristics are copied if it enables us to adopt the norms and values of our culture / to fit in / to be accepted by others / into a group

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**(c) 3 marks for:**

**Mark first three responses only (limitations of profiling)**

- 1 profiling results too vague / do not link cause and effect
- 2 results cannot be generalised (to the behaviours of others) / lacks external validity / sample not representative / inaccurate
- 3 results lack ecological validity / are not true to real life / do not relate to sports performance
- 4 profiling too subjective / results explained differently by different people / unreliable interpretations
- 5 links between personality and sports performance/sport choice/task persistence too tenuous (sceptical approach)
- 6 too many demand characteristics / behaviour of performer may be altered due to profiling / internally invalid / may lie

**(d) Max of 6 marks of 6 from**

**1 mark for:**

(definition) aggression is the attempt to harm outside the rules of the game **and** assertion is forceful behaviour within the rules

**5 marks for 5 from:**

- 1 innate / genetic determinants / behaviours are traits
- 2 frustration/blocked goals
- 3 social learning / copying (significant) others / role models / tribal / group pressure
- 4 cues / triggers / signals from the environment
- 5 retaliation / getting your own back
- 6 perceived / actual unfairness / refs / officials poor decisions
- 7 event importance / competitiveness / need to / pressure to win / as an instrument to gain success
- 8 pressure from others / obeying orders / tactics / others' expectations / rewarded
- 9 hostile crowd
- 10 cultural determinants / it is expected / it is a normal behaviour of the culture
- 11 game determinants / expected / norms in the game (ice hockey) / nature of the game
- 12 alcohol / drugs

**(e) 3 marks for:**

- 1 lower arousal / calm down / relax / count to 10 / meditate / imagery / mental rehearsal / practice / selective attention
- 2 use of punishment / negative feedback
- 3 remove from situation
- 4 positively reinforce non-aggression or assertion / use positive role models
- 5 teach assertive techniques
- 6 educate about outcomes

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(f) 4 marks for 4 from:

**(sub max of 2 marks per style – answers to relate to team sports – accept practical example equivalents)**

**(Task / autocratic style)**

- 1 used in dangerous situations
- 2 used when others may be hostile
- 3 used when time is short
- 4 used in extremely favourable / unfavourable situations (Fiedler) / e.g. for these situations (e.g. winning easily / losing badly)
- 5 used with younger less experienced group members
- 6 for large groups or teams

**(Person/Democratic style)**

- 7 used in moderately favourable situations (Fiedler) / e.g. for these situations (e.g. the game going well / game in the balance)
- 8 used when more time available
- 9 used with older / more experienced group members / to share ideas
- 10 used when plenty of time available
- 11 used with friendly / willing group members

**(Laissez faire style)**

- 12 used with elite / very experienced
- 13 used when members are highly confident
- 14 used to facilitate creativity / problem solving

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**(g) 5 marks for 5 from:**

**4 marks max for effects of an audience**

**4 marks for 4 from:**

- 1 arousal / drive / anxiety increased
- 2 dominant response/habit more likely to occur / learned responses automatic / motor programmes are run
- 3 weaker players / novices performance deteriorates (incorrect dominant response)
- 4 good performances from well learned / stronger / elite
- 5 extroverts likely to perform better with an audience / Reticular activating system (RAS) favours extroverts when audience present
- 6 introverts likely to perform worse with audience present / RAS does not favour introverts
- 7 if audience in familiar setting performance helped / 'homefield' advantage / disadvantage if away / unfamiliar / hostile environment
- 8 anxiety raised by being judged / perceived judgement of others / evaluation apprehension / the nature of the audience / who is in the audience
- 9 proximity of the audience / how close the crowd are to the player
- 10 distractions / widening of attentional focus
- 11 attention narrows for those who are used to audiences / high levels of ability
- 12 size of audience can affect
- 13 loss of confidence

**1 mark max for overcoming audience effects**

**1 mark for 1 from:**

- 14 use of selective attention / concentration / avoiding distractions
- 15 mental rehearsal / practice / imagery / visualisation
- 16 positive self-talk / positive thinking / negative thought-stopping
- 17 practice with an audience present / in training
- 18 learn skills thoroughly / develop motor programmes
- 19 decrease importance of event / reduce perceived accountability
- 20 increase self-confidence / self-efficacy
- 21 social support / encouragement from others

**[Total: 30]**



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**Section C**  
**Olympic Games: A Global Perspective**

**3 (a) 4 marks for 4 of:**

**(mission) – sub max 1 mark for:**

- 1 promote Olympism throughout the world and to lead the Olympic Movement

**(role) – sub max 3 marks for:**

- 1 support ethics in sport / spirit of fair play / education of young people
- 2 coordinate sport and sport competitions / choose host city
- 3 ensure regular Olympic Games
- 4 promote peace / place sport in the service of humanity
- 5 protect independence of Olympic Movement
- 6 act against discrimination affecting the Olympic Movement
- 7 support women in Sport / equality
- 8 lead fight against doping
- 9 encourage measures to protect the health of athletes / make sure facilities are suitable
- 10 oppose political or commercial abuse of athletes
- 11 encourage sport for all
- 12 promote positive legacy from Olympic Games to host cities and countries
- 13 blend culture with education

**(b) (i) 4 marks for 4 of:**

- 1 games used for Nazi propaganda / no expense spared
- 2 Hitler's Aryan race theory / blond / fit
- 3 creation of a master race / superiority
- 4 Hitler dictator / Nazi salute
- 5 Hitler appointed State Director of Sport
- 6 discrimination against Jews / other minority groups taking part
- 7 other countries refused to boycott / wanted to keep relations with Hitler
- 8 introduced Olympic torch as a symbol

**(ii) 3 marks for 3 of:**

- 1 black American of African descent, did not comply with Hitler's vision of Aryan race
- 2 won (4) gold medals in the games
- 3 a supreme / talented athlete
- 4 Hitler refused publicly to acknowledge Owens success
- 5 Owens had worked within Olympic ideals / ethics to win on merit / ignored Hitler / inspired others
- 6 formed a public friendship with a German athlete who helped him to win / mutual respect

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**(c) 6 marks for 6 of:**

- 1 historical attitudes meant disabled were different / unable to take part
- 2 WWI / WWII changed attitudes / medical and social understanding
- 3 legislation / policies changed attitudes
- 4 public / voluntary bodies put provision for disabled sport in place
- 5 recent attempts world wide to increase independence / full integration
- 6 improved classification system developed
- 7 games now held at same venue / follow Olympics
- 8 takes advantage of facilities / technology / expertise / specialist coaching
- 9 barriers overcome / human rights / acceptance into sport and society
- 10 1984: summer and winter games disability sports included as demonstration events
- 11 equity now part of bidding for games
- 12 recent years a growing fusion between two committees
- 13 sports have been devised for disabled e.g. goalball, wheelchair basketball
- 14 now building at grass roots level / more funding available
- 15 games now used as a showcase for disability / role models / more media coverage
- 16 inclusion of disabled athletes in main events
- 17 showcase for a country

**(d) 7 marks for 7 of:**

**Sub max 5 marks for:**

**(positive)**

- 1 athletes from all parts of the world meeting irrespective of colour / race / beliefs / political affiliation
- 2 peaceful meeting / sport transcends war / harmony
- 3 promotion of international understanding
- 4 appreciation of different cultures of the world
- 5 cooperation of nations
- 6 ideal of fair play
- 7 friendships made between individuals of different nationalities

**Sub max 5 marks for:**

**(negative)**

- 8 rumours of widespread drug taking
- 9 win at all costs ethic / cheating
- 10 terrorist infiltration
- 11 government interference for the country's own ends
- 12 athletes being used as pawns for their governments
- 13 host country human rights issues

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(e) 6 marks for 6 of:

**2 marks for each of three reforms**

**(Accept any relevant and realistic reforms but must justify for two marks)**

**For example**

**(1)**

- 1 revision of opening / closing ceremonies
- 2 **because:** too expensive / do not reflect athletes

**(2)**

- 1 use of multiple / permanent sites
- 2 **because** expense to host nation

**(3)**

- 1 removal of politics from sport
- 2 **because** nations use of the games for nationalistic purposes

**(4)**

- 1 solve the performance enhancement issue
- 2 **because** need to remove cheating / win at all costs ethic

**(5)**

- 1 revision of the motto
- 2 **because** it does not reflect fair play

**(6)**

- 1 dropping of wealth sports e.g. sailing / horses
- 2 **because** events need to be available for all

**[Total: 30]**