

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Level

MARK SCHEME for the October/November 2014 series

9396 PHYSICAL EDUCATION

9396/31

Paper 3, maximum raw mark 90

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Section A
Exercise and Sport Physiology

1 (a) (i) 2 marks for 2 of:

1. Energy – capacity of the body to perform work
2. Kinetic energy – energy of an object due to its motion / work needed to cause an acceleration of the body from rest to a specific velocity

(ii) 6 marks for 6 of:

1. Glycolysis
2. Glycogen / glucose broken down ...
3. ... into pyruvate / pyruvic acid
4. Some ATP produced / 2 ATP
5. Krebs cycle
6. (Fats used in the form of) triglycerides / fatty acids / glycerol
7. Beta oxidation / fats provide much higher amounts of ATP (depending on type)
8. Oxidation of acetyl coenzyme A / citric acid / production of CO₂
9. 2 ATP produced
10. Electron transport chain
11. Water / H₂O formed / hydrogen ions formed (H⁺) / hydrogen / protons
12. Large quantities of ATP produced or resynthesized / 34 ATP (from ETC) / 38 ATP in total

(b) 4 marks for 4 of:

1. Lifestyle – lack of exercise / smoking / poor diet
2. Training – continuous / aerobic / fartlek improves VO₂ max / stamina / endurance training
3. Age – VO₂ max decreases with age
4. Physiology – number of slow twitch fibres / capillary density / number of mitochondria / haemoglobin content / surface area of alveoli / red blood cell count / efficiency of heart or equivalent
5. Physiology – second mark available or any other suitable physiological example
6. Genetics – inherited factors limit possible improvement
7. Gender – men generally have (approx. 20%) higher VO₂ max than women
8. Body composition – higher percentage of body fat decreases VO₂ max / poor diet reduces VO₂ max / overweight / obese

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(c) 6 marks for 6 of:

1. (Divided into two stages) – fast and slow components
2. (Fast component) alactacid / lactic debt
3. Re-saturation of myoglobin with oxygen
4. Restoration of ATP / PC levels
5. (Slow component) lactacid debt
6. Removal of lactic acid
7. By oxidation / aerobic energy production
8. In other organs (liver) / muscle / Cori cycle
9. Conversion to pyruvate
10. To water and carbon dioxide
11. Conversion to glycogen / glucose
12. Conversion to protein / excreted in sweat and/or urine
13. Elevated circulatory / respiratory rates to maintain oxygen supply to muscles
14. Extra oxygen used as temperature remains high

(d) (i) 3 marks for 3 of:

1. 60 – 80% max. heart rate
2. Max. heart rate = 220 – current age
3. Karvonen Principle / formula
4. (Explanation of Karvonen Principle)

$$\text{HR reserve} = \text{HR (max)} - \text{HR (rest)}$$

$$([\text{HR (max)} - \text{HR (rest)}] \times \% \text{ intensity of exercise}) + \text{HR (rest)}$$

(ii) 5 marks for 5 of:

1. Cardiac hypertrophy (Do not accept: bigger / stronger heart)
2. Increased stroke volume
3. Lower resting heart rate / bradycardia
4. Increased maximum cardiac output
5. Increased capillarisation (of trained muscle) / development of new capillaries
6. Improved efficiency of vasoconstriction and vasodilation / improved vascular shunt / increased elasticity of arteries/arterioles
7. Decrease in resting blood pressure
8. Increase in blood plasma / decreased blood viscosity
9. Increase in red blood cell volume and haemoglobin

(e) 4 marks for 4 of:

1. Involves the removal and re-injection of the blood of a performer
2. Approximately 1 litre / 2 pints
3. Causes an increase in red blood cells/haematocrit
4. More haemoglobin
5. Improves the oxygen carrying capacity of the blood
6. Greater amount of oxyhaemoglobin formed

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Section B
Psychology of Sport Performance

2 (a) (i) 3 marks for 3 of:

identify and describe for the mark (sub-max 1 mark if no example)

1. Cognitive (component) – beliefs / thoughts, e.g. fitness is good for you
2. Affective (component) – feelings / emotions, e.g. fitness is fun
3. Behavioural (component) – actions / responses of the player, e.g. complete training programme

(ii) 3 marks for 3 of:

1. Use a messenger of high status / person delivering information should be respected / significant other
2. Deliver a high quality message / new information to challenge existing thoughts and emotions / consistent message / correct use of attribution theory
3. Select a suitable situation / time when message is given / one to one situation
4. Assess the individual / team resistance to change / individual or team must want to change

(b) 3 marks for 3 of:

(sub-max 1 if no practical example)

1. Highly focussed on the task / good selective attention / fully absorbed in the activity / ignore irrelevant stimuli / effective decision making
2. Movement or skill feels effortless / automatic
3. Clear goals / high levels of achievement motivation
4. High levels of confidence / self-efficacy / positive attitude / low anxiety / mastery orientation
5. Sub-conscious feelings of control / being on autopilot
6. Enjoyment / satisfaction / self-fulfilment

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(c) 3 marks for 3 of:

1. Imagery / visualisation / mental rehearsal

2. Formation of mental pictures of good performance / imagine in a calm place
3. Internal – creating the feeling of the movement / sensations
4. External – seeing themselves completing the movement

5. Self-talk / positive self-talk

6. Use when negative thoughts occur
7. Replace with positive statements about performance
8. Example – nerves are good before the race or equiv.

9. Thought-stopping

10. Use of cue / action / word
11. Re-directs attention to positive thoughts
12. Example – key word – focus / click fingers or equiv.

13. Rational / Positive Thinking

14. Challenge negative thoughts by reasoned argument
15. Identify specific areas and switch to create an opportunity rather than a distraction
16. Example – I haven't trained enough – identify training completed – believe training has been successful

(d) (i) 4 marks for 4 of:

1. Larger number of home supporters / encouragement / positive reinforcement / expectation of success
2. Increased self-efficacy / lower levels of anxiety / increased motivation / increased arousal
3. Home teams tend to play more attacking styles / tactics / functional aggressive behaviour
4. Proximity effect / closeness of crowd has negative effect on visiting teams / crowd noise distracting away team
5. Larger crowd / hostile crowd has a negative effect on away teams
6. Away teams often commit more fouls / can become anxious / over-aroused due to crowd or unfamiliar surroundings / accept reverse answer for home team
7. More matches won at home than away / during early rounds of competitions / Olympic and World medals by host nation

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(ii) 5 marks for 5 of:

1. Introduce an audience at training sessions / gradually increase the number of spectators at training
2. Reduce the importance of the event
3. Improve selective attention
4. Avoid social comparison with others / teach / coach in a non-evaluative environment / verbal encouragement
5. Team mates actively support each other / avoid blame culture / team building exercises
6. Use stress management and relaxation techniques / goal setting / mental rehearsal / accept named examples
7. Accept second named stress management technique
8. Use attributions correctly / accept suitable examples
9. Ensure skills are well learnt / over-learned to encourage the dominant habit to occur as the levels of arousal increase / highly skilled / autonomous phase
10. Performance accomplishments / ensure success / create opportunities for success

(e) (i) 4 marks for 4 of:

1. (Cohesive group) – the tendency of a group to stay together to achieve certain objectives or outcomes
2. Task cohesion – the ability of the group to achieve a common goal
3. Social cohesion – the ability of the group to relate well to each other / get along socially

Reasons for importance of cohesion: (sub-max 3)

4. Avoid motivation / co-ordination losses / social loafing / Ringelmann effect
5. Players need to be able to have good communication / interact effectively
6. Need to understand own role / role of others / awareness of strategies and tactics / trust each other
7. Good task cohesion can help social cohesion
8. Task cohesion is more important than social cohesion / social cohesion is not vital for group success
9. Social cohesion can aid team performance by challenging the norm

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(ii) 5 marks for 5 of:

1. Practice / training to ensure all players understand the tactics
2. Vary practice to maintain motivation / train in small groups
3. Set common team goals
4. Task oriented goals are more effective
5. Have highly motivated individuals / issue rewards / create desire for success / punish selfish play / positive reinforcement for good team work
6. Set individual goals / give individuals specific responsibility / explain specific roles within the team / individuals understand and accept their role within team / awareness of roles of others within team
7. Appropriate leadership style / democratic leadership / decision making style
8. Keep team together / give time for cohesion to develop / social events / limit change of team members / team bonding exercises
9. Give feedback / video analysis of performance
10. Develop peer support / encourage each other / encourage open discussion
11. Improve fitness levels
12. Avoid social cliques / select 'team' players
13. Create a group identity, e.g. team kit
14. Develop self-confidence / self-efficacy / self-esteem / credit use of attributions

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Section C
Olympic Games; A Global Perspective

- 3 (a) (i) 6 marks for 6 of:**
(sub-max 4 per section)

Differences – must have both points to be credited with mark:

<p>Ancient</p> <ol style="list-style-type: none"> 1. Religious festival 2. Over 5 days 3. Prizes were wreaths of olive leaves 4. Males only 5. 32 events 6. Always held at Olympia 	<p>Modern</p> <ol style="list-style-type: none"> 1. Secular 2. Over 2 weeks 3. Medals 4. Women included 5. Over 300 events 6. Different countries / cities used
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Similarities:

7. The term Olympiad still used
8. Institutionalised
9. Similar sports e.g. athletics
10. Still every 4 years
11. Different cultures meet and compete / festival nature / sporting and cultural event
12. Specialist sites
13. Economic benefits sought by cities / economic benefits to successful athletes on return to home / became cult figures
14. Eligibility standards of competition
15. Specialised training
16. Values and ethics embedded
17. Athletes take oath / opening ceremony
18. Olympic flame
19. Force for social unity

- (ii) 5 marks for 5 of:**
(sub-max of 4 marks for benefits or drawbacks)

Benefits:

1. Promote the city / country / civic pride
2. Improve infrastructure / redevelop / rejuvenate city / legacy facilities / sustainability
3. Gain income from tourism / economics / employment
4. Improve community spirit / integration
5. Increase participation = improved health / more medals
6. Home crowd support / volunteers
7. Training camps put on by other cities / areas

Drawbacks:

8. Cost / money could be spent in other areas of society
9. Pressure on infrastructure / increased traffic
10. Only [London] city may benefit / not other areas
11. Security threats
12. Relocation of businesses / housing
13. Facilities unused after the event / White Elephants
14. Poor running of event can hinder future bids

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(iii) 6 marks for 6 of:

Role: (sub-max 3)

1. Leads the Olympic movement / protects independence of Olympic Movement / select host city / ensure regular celebration of Olympic Games
2. Promote ethics of fair play in sport / ideals of Olympism
3. Encourage education of youth through sport
4. Act against discrimination affecting Olympic movement
5. Protect health of athletes
6. Anti-doping policies / accredited laboratories
7. Equality issues / sport for all / promotion of women in sport
8. Protect sports from political or commercial abuse
9. Support activities of International Olympic Academy
10. Promote positive Games legacy / responsible concern for environmental issues

Problems: (sub-max 3)

11. Controversy over bidding and selection of cities / bribery / corruption allegations
12. Criticism of host countries e.g. China – human rights / Berlin – banning Jewish athletes
13. Political issues affecting specific games e.g. Munich – terrorism / various boycotts
14. Athletes doping
15. Ethical sponsors of the Games
16. Transition from amateurism to professionalism
17. Accept any other problem if valid

(b) (i) 3 marks for 3 of:

1. Compete in sport for the love of it
2. No monetary reward
3. Tended to be a social class distinction / upper class / gentry / 'gentleman amateur'
4. Values of participation more important than winning / sportsmanship / fair play
5. All-rounder highly regarded rather than specialising professional
6. Term used to exclude working class from Olympic Games

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(ii) 6 marks for 6 of:

1. (Global media coverage) attracts sponsorship / increase in funding
2. Allows OG to attract world class athletes
3. Companies have to abide by ethics / Olympic ideals
4. Do not have stadium advertising
5. Funding from variety of sources, e.g. government / private companies / media rights
6. NOC's provided with financial help / prevent host city getting into financial difficulty
7. Provide merchandise
8. Ensure financial stability of Games
9. Provides free air / TV transmission across world
10. Employment of professionals in the business administration / design / creativity, etc.
11. Money towards anti-doping measures

(c) 4 marks for 4 of:

1. Prior to World War II belief that disabled people could not participate in sport
2. Developed through treatment of injured soldiers / Sir Ludwig Guttman / Stoke Mandeville
3. Rehabilitative / morale boosting
4. Technology helped develop equipment / new sports
5. Legislation / growth in equal opportunities in society / aim to create elite sports competition for disabled athletes which is equivalent to the Olympic Games
6. Classification system developed
7. Treated similarly to Olympic Games today– venues / media coverage / opening-closing ceremonies etc.
8. Seoul Paralympics – first use of name