

Mark Scheme (Results) Summer 2008

GCE

GCE Physical Education (6726) paper 01

Unit 6: Scientific Principles of Exercise and Performance (6726)

Section A: Exercise and Energy Systems

Question Number	Answer	Mark
1(a)(i)	<p>7 marks for 7 of:</p> <ol style="list-style-type: none"> 1. 4 - 7 days is recognised as a suitable time scale in which to carbohydrate load 2. the bodies level of glycogen must be reduced/depleted through exercise 3. levels of glycogen must be maintained at a low level for several days by moderate exercise/low carbohydrate diet 4. this needs to be done order to stress the body 5. pre race/one or two days/the athlete should rapidly increase their carbohydrate intake 6. levels of glycogen are managed by increased levels of short intense activity 7. decrease/no activity 2/3 days prior to event 8. to allow the body to super compensate 9. to allow body to hold onto more carbohydrate/glycogen. 	(7)

Question Number	Answer	Mark
1(a)(ii)	<p>3 marks for 3 of:</p> <ol style="list-style-type: none"> 1. low blood sugar levels pre event 2. decreasing training approaching an event 3. the body has a limit for the amount of glycogen it can ingest 4. timing is problematic-how close to the event to do it? 5. weight gain 6. can be stored as fat if the right amount not calculated 7. ingestion of carbs may reduce ingestion of other nutrients 8. sleep patterns can be affected 9. feeling fatigued/over full 10. not enough glycogen is stored. 	(3)

Question Number	Answer	Mark
1(b)(i)	<p>6 marks for 6 of:</p> <ol style="list-style-type: none"> 1. the first stage of the process is glycolysis 2. glucose is broken down in the presence of glycolytic enzymes 3. the yield is 2 x ATP 4. and (2) Pyruvic acid 5. the Pyruvic acid in the presence of oxygen is further broken down 6. Pyruvic acid enters the mitochondria 7. here it is broken down into acetyl-Co enzyme A 8. the next step is Krebs cycle/Oxaloacetic acid/this reacts to produce citric acid 9. positive hydrogen ions are produced in the Krebs cycle 10. the cycle creates sufficient energy to produce 2 additional ATP's 11. the hydrogen ions are transported to the electron transport chain/NADH/FADH 12. electron transport chain yields a further 32/34 additional ATP's 13. 38 ATPs made in total. <p>Annotated diagrams are acceptable</p>	(6)

Question Number	Answer	Mark
1(b)(ii)	<p>2 marks for the following:</p> <ol style="list-style-type: none"> 1. total yield/aerobic energy pathway can produce up to 36/38 ATP's from 1 glucose molecule (accept 32/34 as aerobic yield) 2. the lactic acid energy pathway/anaerobic glycolysis can produce 2/4 ATP's per glucose molecule. 	(2)

Question Number	Answer	Mark
1(c)	<p>7 marks for 7 of:</p> <ol style="list-style-type: none"> 1. The continuum uses athletic track events to identify that all three energy pathways work all of the time to produce the required energy but 2. one pathway is dominant at any one time dependent upon 3. the intensity and duration of the activity 4. This allows athletes to plan their training to take account of the dependence of their energy requirements during their event 5. e.g. the 1500m track event is set at the mid point on the continuum 6. Approximately equal amounts of energy are fueled by each of the three energy pathways during the race 7. start/80 m main provider being the ATP-PC pathway 8. remaining first lap - lactic acid pathway 9. next 800m - aerobic pathway 10. first 200/300 meters of the last lap - lactic acid pathway 11. final 100/150m - ATP-PC pathway 12. diagram of continuum with 100% aerobic at one end and 100% anaerobic at the other. <p>Any accurately explained example is acceptable eg games</p>	(7)

(Total 25 marks)

Question Number	Answer	Mark
2(a)(i)	<p>3 marks for following:</p> <ol style="list-style-type: none"> 1. aerobic energy system 2. lactic acid energy system/anaerobic glycolysis 3. alactic energy system/ATP-PC/phospho-creatine/PC energy system. 	(3)

Question Number	Answer	Mark
2(a)(ii)	<p>1 mark for each of the following points:</p> <p>Aerobic Energy Pathway</p> <ol style="list-style-type: none"> 1. marathon runner 2. the pathway produces a significant energy yield but the process is not rapid and does not support intense actions/sub-maximal activity of a long duration. <p>Lactic Acid Energy Pathway</p> <ol style="list-style-type: none"> 3. 400/800m track athlete 4. high/near maximal contractions can be supported by this energy pathway which makes energy very quickly and can support activity for significantly longer than the Alactic pathway (greater than 10 seconds). <p>Alactic Energy Pathway/ATP-PC energy Pathway</p> <ol style="list-style-type: none"> 5. Shot Put 6. will produce energy immediately that can support maximal intensity but only for a matter of approx. 10 seconds. <p>Can use different phases of a singular example eg 1500m/team game. Explanations must include intensity and be linked to a specific event.</p>	(6)

Question Number	Answer	Mark
2(b)(i)	<p>2 marks for the following:</p> <ol style="list-style-type: none"> 1. anaerobic threshold - Point at which energy production/ATP resynthesis is increasingly reliant/predominantly produced by either of the two anaerobic energy pathways 2. OBLA - Onset of Blood Lactate Accumulation. 	(2)

Question Number	Answer	Mark
2(b)(ii)	<p>3 marks for 3 of:</p> <ol style="list-style-type: none"> 1. training that is aimed at a target zone just above the current anaerobic threshold/point of OBLA 2. any suitable type of training eg interval/fartlek/high intensity continuous training allows the intensity to be sufficiently high with rest periods/lower intensity which specifically prevents full recovery 3. the body needs to be stressed in order to encourage the necessary adaptations 4. insufficient time to remove lactic acid/fully recover 5. the body adapts ie becomes better able to deal with lactic acid 6. better able to remove lactate acid through improved vascularisation etc. 	(3)

Question Number	Answer	Mark
2(b)(iii)	3 marks for 3 of: 1. increased vascularisation/cappillarisation of the muscle 2. increased myoglobin levels 3. cardiac hypertrophy 4. > SV 5. > Q 6. strength of ventricular contractions 7. End Systolic volume/< End Systolic Volume 8. Bradycardia/lower resting heart rate 9. increased mitochondria 10. increased PC stores 11. more RBCs 12. Increased buffering capacity (acceptance of H ⁺ ions)	(3)

Question Number	Answer	Mark
2(c)(i)	3 marks for following: 1. O ² debt refers specifically to the additional O ² that would have been required by the athlete to meet the demands of the activity aerobically 2. EPOC/Excess Post exercise Oxygen Consumption refers to the O ² required after activity above normal resting ventilation levels in order to return the body back to a pre exercise state 3. all O ² debts are EPOCS but not all EPOCS are O ² debts.	(3)

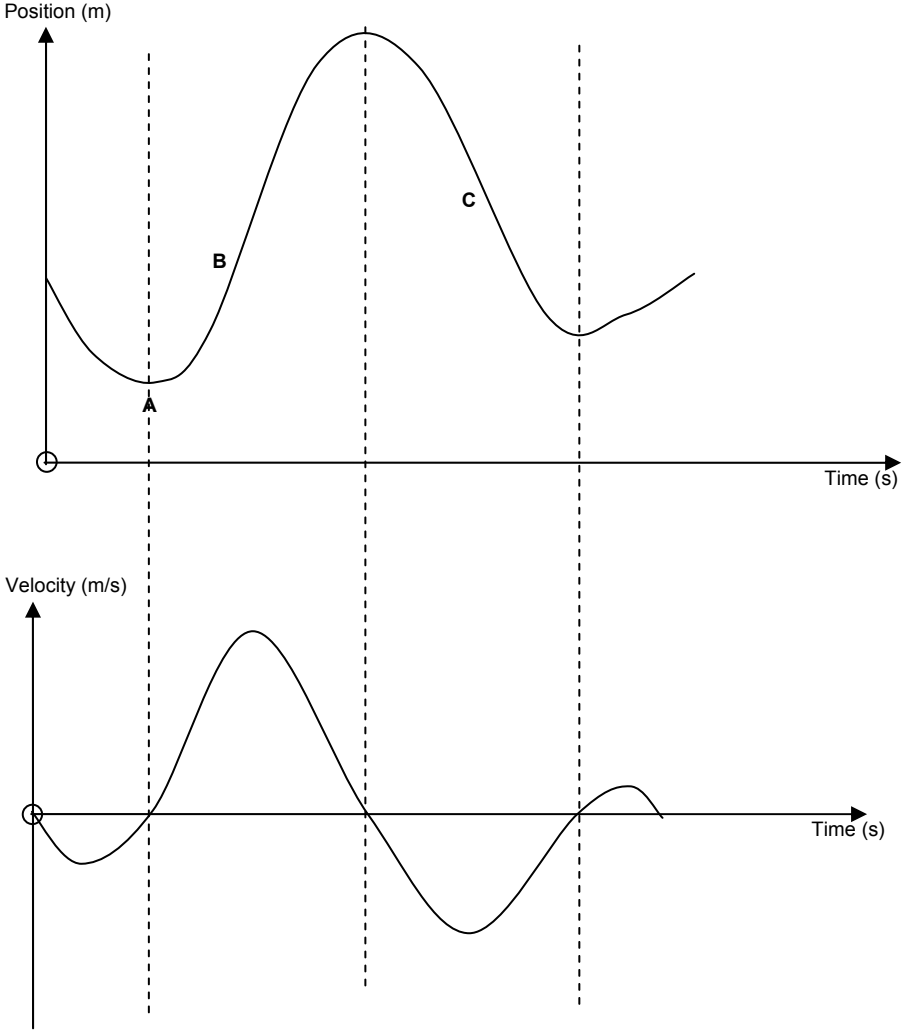
Question Number	Answer	Mark																
2(c)(ii)	Max 4 marks available for explanation; 1. energy from the aerobic system is used to resynthesise PC 2. aerobic energy is used to manufacture ATP from ADP and P/Pi (the products of ATP consumption) 3. some of this ATP is immediately utilised to create PC 4. using the coupled reaction. Max 4 marks available for accurate timed replenishment; <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Recovery time (secs)</th> <th>Muscle phosphogen restored</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>10%</td> </tr> <tr> <td>30</td> <td>50%</td> </tr> <tr> <td>60</td> <td>75%</td> </tr> <tr> <td>90</td> <td>87%</td> </tr> <tr> <td>120</td> <td>93%</td> </tr> <tr> <td>150</td> <td>97%</td> </tr> <tr> <td>180</td> <td>99% (allow 100%)</td> </tr> </tbody> </table> Max 5 marks for a combination of the explanation and stating accurate timed replenishment.	Recovery time (secs)	Muscle phosphogen restored	10	10%	30	50%	60	75%	90	87%	120	93%	150	97%	180	99% (allow 100%)	(5)
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150	97%																	
180	99% (allow 100%)																	

(Total 25 marks)

Section B: Sports Mechanics and Sports Psychology

Question Number	Answer	Mark
3(a)(i)	Sub max of 1 for each term <ol style="list-style-type: none">1. distance is a scalar quantity2. it only has size/measured in meters/length of the path between two points3. displacement is a vector quantity4. it has both magnitude and direction/difference in length between starting and finishing points independent of path.	(2)

Question Number	Answer	Mark
3(a)(ii)	Sub max of 1 per term <ol style="list-style-type: none">1. distance is measured in meters only and so the runner has covered2. distance of 400m3. displacement is how far has been traveled in relation to the start point and because the runner finishes where they started4. displacement is 0.	(2)

Question Number	Answer	Mark
3(b)(i)	 <p data-bbox="331 1391 938 1563"> 1. correctly drawn and labelled axis 2. zero velocity at the correct points 3. negative velocity at the correct points 4. positive velocity at the correct points 5. relative size of max/min points is correct. </p>	(4)

Question Number	Answer	Mark
3(b)(ii)	<p data-bbox="347 1697 571 1731">3 marks for 3 of:</p> <ol data-bbox="347 1733 1225 2004" style="list-style-type: none"> point A: change in direction and therefore velocity is zero point B: positive change in slope/displacement and therefore positive velocity point B: steepest slope therefore peak velocity point C: negative change in slope/displacement and therefore negative velocity point C: steepest negative slope therefore peak negative velocity, but not as high in magnitude as B. 	(3)

Question Number	Answer	Mark
3(c)(i)	3 marks for following: 1. momentum= mass x velocity 2. mass = 160g = 0.16kg 3. momentum = 0.16 x 40 = 6.4 kg m/s	(3)

Question Number	Answer	Mark
3(c)(ii)	2 marks for following: 1. air resistance slows the ball down/external force acting against the direction of motion 2. when the ball impacts the ground, it experiences frictional forces which act against the direction of motion which slows the ball down.	(2)

Question Number	Answer	Mark
3(c)(iii)	1. momentum of bat before = $-10 \times 1.25 = -12.5$ kg m/s 2. conservation of momentum: momentum before = momentum afterwards. 3. $(0.16 \times 37) + (-12.5) = (1.25 \times 0) + (0.16 \times v)$ 4. $-6.58/0.16 = v = -41.125$ m/s.	(3)

Question Number	Answer	Mark
3(c)(iv)	Sub max of 3 per law 1. 1 st law: every body at rest, or moving with constant velocity in a straight line, will continue in that state unless compelled to change by an external force exerted upon it 2. there must be a force acting upon the ball because the velocity is not constant/it slows down 3. the velocity is not constant because friction/air resistance is slowing the ball down 4. the force applied to the ball by the batsman hitting it causes it to change direction 5. 3 rd law: for every action, there is an equal and opposite reaction 6. the force exerted on the ball by the bat is equal but opposite to the force exerted on the bat by the ball 7. the force exerted by the ball on the ground is equal and opposite to the force exerted by the ground on the ball/or equivalent.	(6)

(Total 25 marks)

Question Number	Answer	Mark
4(a)	<p>Sub max of 2 for how/shape of flight path</p> <ol style="list-style-type: none"> 1. top spin dips sharper/faster than back spin 2. because of that, top spin has a relatively higher trajectory than back spin (so to avoid the net) 3. back spin has a flatter descent/ball is in air for longer 4. because of that, back spin has a relatively lower trajectory than top spin (so to avoid the ball going out) 5. when airflow over one surface of an object is at a different velocity to airflow over another surface of the object, this creates a pressure difference (Bernoulli effect) 6. this pressure difference creates a force/Magnus force 7. the object will move from an area of high pressure to low pressure 8. top Spin: the boundary layer above the ball is moving in opposition to air resistance/flow 9. this causes low air velocity/high pressure 10. the boundary layer below the ball is moving in same direction to air resistance/flow 11. this causes high air velocity/low pressure 12. creates a resultant Magnus force downwards, which forces the ball to dip 13. back spin: the boundary layer above the ball is moving in same direction to air resistance/flow 14. this causes high air velocity/low pressure 15. the boundary layer below the ball is moving in opposition to air resistance/flow 16. this causes low air velocity/high pressure 17. creates a resultant Magnus force upwards, which forces the ball to lift. <p>Correctly labelled diagrams are also acceptable.</p>	(8)

Question Number	Answer	Mark
4(b)	<p>3 marks for following:</p> <ol style="list-style-type: none"> 1. flight path of an object is at a tangent to circular path when circular motion is involved eg discus/baseball pitch 2. angle of release affects flight path because it affects horizontal distance/if height of release=height of landing, optimum angle is always 45°/if height of release is $>$ height of landing, optimum angle is less than 45° eg optimum angle of release for javelin is slightly less than 45° 3. release too early/late, object will not travel in intended direction eg hammer flies into cage when released too early/late. 	(3)

Question Number	Answer	Mark
4(c)	<p>Sub max of 2 per factor</p> <ol style="list-style-type: none"> 1. height of centre of mass 2. lowering centre of mass closer to base of support increases stability 3. body weight 4. the heavier the more stable 5. base of support 6. the larger/more points of contact with supporting surface the more stable 7. line of action/gravity of body weight 8. passing within the base of support increases stability 9. friction 10. the more friction between the supporting surface and the base of support, the more stable 11. external forces 12. the application of external forces that cause the line of action of the COM to move outside base of support decreases the stability. 	(8)

Question Number	Answer	Mark
4(d)(i)	<p>Definition:</p> <ol style="list-style-type: none"> 1. the tendency of an object to resist angular motion about an axis of rotation. <p>Magnitude will be affected by:</p> <ol style="list-style-type: none"> 2. the quantity of mass distributed around the axis of rotation 3. the more mass the more the moment of inertia 4. the distribution of the mass around the axis of rotation 5. the closer the mass is distributed to the axis of rotation, the lower the moment of inertia. <p>Sub max 2 for magnitude.</p>	(3)

Question Number	Answer	Mark
4(d)(ii)	<p>Must use examples to explain points.</p> <p>3 marks for 3 of:</p> <ol style="list-style-type: none"> 1. conservation of angular momentum/angular momentum = moment of inertia x angular velocity 2. re-distributing the mass of an object/altering moment of inertia 3. eg an ice skater will pull their arms in so they can spin faster/a long jumper will throw their arms out/up to minimise forward rotation 4. applying an eccentric/off-centre force/torque 5. eg striking a football off centre will cause it to spin 6. eg leaning forward so the line of action of COM moves outside the base of support will cause a gymnast to rotate forwards/perform a forward roll. 	(3)

(Total 25 marks)

Question Number	Answer	Mark
5(a)(i)	<p>Sub max of 2 per law</p> <ol style="list-style-type: none"> 1. law of Exercise 2. S-R bond/learning becomes stronger if the action is repeated/practiced 3. law of Readiness 4. the learner must be physically and mentally mature/prepared in order to be able to learn the skill 5. law of Effect 6. S-R bond/learning becomes stronger if a response is followed by a satisfier (praise)/becomes weaker if followed by an annoy (punishment)/the outcomes/consequences of an action will determine how likely it is to be repeated. 	(6)

Question Number	Answer	Mark
5(a)(ii)	<p>Must use example(s) to support answer - no example, no marks. 3 marks for following:</p> <ol style="list-style-type: none"> 1. the coach must give the learner opportunity to repeat/perform the action over and over gain. eg a hockey player performs 20 penalty flicks every session 2. the coach must ensure that the player is at the correct stage of physical/mental maturation/development before they learn a skill eg a basketball coach should not try and teach a player to slam dunk until they are physically able to jump high enough 3. the coach must provide/the player must receive the correct type of feedback/reinforcement after a response so the learner can evaluate how successful they've been eg a footballer tries to dribble the ball out of defense and is tackled and the opposition score they are unlikely to attempt it again. 	(3)

Question Number	Answer	Mark
5(b)	<p>2 marks for following:</p> <ol style="list-style-type: none"> 1. extrovert - introvert 2. stable - neurotic/unstable (allow stability). 	(2)

Question Number	Answer	Mark
5(c)	<p>4 marks for following:</p> <ol style="list-style-type: none"> 1. need to Achieve/NAch 2. people are driven to take on challenges/like to push themselves and aren't concerned with failure/don't see failure as a bad thing/see failure as an opportunity to learn and improve 3. need to Avoid Failure/NAF 4. people are driven to avoid failure/aren't concerned with pushing themselves/want to avoid humiliation or shame due to failure. <p>Accurately explained examples are acceptable</p>	(4)

Question Number	Answer	Mark
5(d)(i)	<p>3 marks for 3 of:</p> <ol style="list-style-type: none"> 1. the presence of a crowd always affects performance 2. the presence of an audience causes arousal levels to increase 3. for low levels of arousal, skill performance is hardly affected 4. as arousal levels increase, the more likely a performer is to perform their habits/well learned skills/dominant response 5. the relationship is a positive linear relationship. 	(3)

Question Number	Answer	Mark
5(d)(ii)	<p>Sub max of 2 per beginner/advanced.</p> <ol style="list-style-type: none"> 1. beginners: High levels of arousal/performance in front of audience should be avoided 2. because this would lead to poor performances as they haven't learnt the correct habits/skills 3. they should learn habits first in closed environments 4. advanced: Performance in front of audiences should be encouraged 5. because this would raise arousal levels and therefore they would perform well learned skills/habits 6. they should practise/learn in open environments. 	(4)

Question Number	Answer	Mark
5(e)	<ol style="list-style-type: none"> 1. we are born with aggressive tendencies/aggression is an instinct 2. aggression is biologically determined/imprinted so we can dominate/survive (accept reference to 'being threatened') 3. aggression/aggressive feelings/emotions/energy builds up inside us 4. this energy needs to be released for us to be happy/comfortable/stable/cathartic release is needed 5. sport provides an ideal opportunity for a cathartic release/displacement 6. sometimes sport can enhance aggressive feelings/tip the balance and cause its release 7. suitable example of application of above points. <p>Sub max 2 marks for explanation and sub max 2 marks for application.</p>	(3)

(Total 25 marks)

Question Number	Answer	Mark
6(a)	<p>4 marks for 4 of:</p> <ol style="list-style-type: none"> 1. skills should not be broken down into parts/holistic approach 2. because this will remove the overall feel/kinaesthetic/experience of the movement 3. learners should understand/be shown/taught how and why they are to perform a certain skill 4. learners need to develop an understanding of the problems they are likely to experience 5. this is so they aren't just performing pre-programmed responses to situations 6. but they are developing and devising solutions to the situations they are in 7. this can be helped by trial and error learning 8. and the use of appropriate reinforcement 9. learning takes longer and so motivation/rewards are important. <p>Sub max 2 marks if no example.</p>	(4)

Question Number	Answer	Mark
6(b)	<p>5 marks for 5 of:</p> <ol style="list-style-type: none"> 1. performer has a drive to achieve a goal 2. goal is blocked 3. performer becomes frustrated 4. frustration leads to aggression 5. if player is punished for aggression this often leads to further frustration 6. if performer isn't punished/gets away with aggressive act then catharsis is experienced. <p>Sub max 3 marks if no example.</p>	(5)

Question Number	Answer	Mark
6(c)	<p>Sub max of 2 for each factor</p> <ol style="list-style-type: none"> 1. attention/concentration 2. the learner must attend to the appropriate cues/factors/features/teaching points 3. or Learning will be better if the learner likes/respects the person they are watching. 4. retention/remembering 5. learning will be more permanent if the learner can recall what was said/seen/Mental rehearsal can help with this. 6. motivation. 7. learning is more likely if the learner wants to copy the behavior 8. the learner must feel that copying the behavior is important/relevant 9. (motor) reproduction/repetition 10. the learner must have the opportunity to copy/practice/rehearse/reproduce the behavior they have seen. 	(8)

Question Number	Answer	Mark
6(d)(i)	<p>Sub max of 1 mark for each</p> <ol style="list-style-type: none"> 1. trait anxiety: we are all born with a certain level of anxiety/tendency to be anxious 2. anxiety that we inherit/is innate 3. state anxiety: anxiety that is brought on by the situation 4. tends to only last for the duration of the situation. 	(2)

Question Number	Answer	Mark
6(d)(ii)	<p>Sub max of 2 for differences.</p> <ol style="list-style-type: none"> 1. cognitive anxiety is psychological/thoughts of worry and doubt/psychological fear/apprehension where as Somatic anxiety is a physiological response to cognitive anxiety/increased sweating/shaking/increased muscle tension etc 2. cognitive anxiety can last for the duration of performance where as Somatic anxiety tends to disappear/decrease/be overtaken by physiological systems once performance begins. <p>Sub max of 2 for each type of anxiety.</p> <p>(cognitive)</p> <ol style="list-style-type: none"> 3. cognitive anxiety has a negative linear affect on performance 4. for low levels of Cognitive anxiety, performance remains high 5. for high levels of Cognitive anxiety, performance is low. <p>(somatic)</p> <ol style="list-style-type: none"> 6. affect of somatic anxiety on performance follows ‘inverted-U shape/Shape of curve follows an inverse parabola/upside down U 7. as somatic anxiety levels increase so does performance 8. up to a point/up to optimum level of somatic anxiety for maximum performance 9. after which further increases in somatic anxiety cause performance to deteriorate. 	(6)

(Total 25 marks)

Section C: A Synoptic Analysis of Scientific Principles

Question Number	Indicative content
7	<p>Candidates should be given credit for more contemporary examples.</p> <p>The following are potential areas for discussion but should be backed up with relevant examples.</p> <p>Skill Acquisition</p> <ul style="list-style-type: none"> • fine tuning of technique • access to more advanced feedback methods <p>Sports Psychology</p> <ul style="list-style-type: none"> • highly qualified sports psychologists • able to use a variety of psychological techniques to cope with stress/ success/ failure • atmosphere of excellence enhances confidence • team cohesion <p>Exercise & Training</p> <ul style="list-style-type: none"> • access to better training facilities • access to hypoxic chambers/hydrostatic pools etc • more accurate fitness assessment • more precise and reliable fitness monitoring equipment/techniques • rehabilitation is quicker due to advance technology <p>Exercise and Energy Systems</p> <ul style="list-style-type: none"> • establishment of thresholds/OBLA/Lactate threshold is more accurate • monitoring of recovery process • controlled diet/scientifically controlled nutrition • assessment and monitoring of structural and functional adaptations is more accurate • highly qualified sports physiologists <p>Sports Mechanics</p> <ul style="list-style-type: none"> • work with specific equipment/tailor made equipment & clothing • more technologically advanced assessment and monitoring equipment. • access to best biomechanists <p>Socio-cultural aspects</p> <ul style="list-style-type: none"> • media exposure • full time athletes as opposed to part time • work at sports academies/sports institutes/access to institutes of sports • full time, year round support from back up team. • expense may be an issue for smaller countries/governing bodies.

(Total 25 marks)

Question Number	Indicative content
8	<p>Candidates should be given credit for more contemporary examples.</p> <p>The following are potential areas for discussion but should be backed up with relevant examples.</p> <p>Skill Acquisition</p> <ul style="list-style-type: none"> • variety of feedback techniques allows weaknesses to be highlighted and targeted • machinery/equipment now allows recreation of sporting environment in order to make practice more specific • tailored equipment to maximise efficient technique <p>Sports Psychology</p> <ul style="list-style-type: none"> • advanced technology allows monitoring of stress levels/arousal/anxiety • increased confidence • less worry/cognitive anxiety due to increased confidence <p>Exercise & Training</p> <ul style="list-style-type: none"> • ability to re-create any training environment without having to travel • advanced fitness assessment methods <p>Exercise and Energy Systems</p> <ul style="list-style-type: none"> • precise establishment of thresholds is now possible • ability to target specific structural and functional adaptations • able to produce food supplements/nutritional supplements that control the diet <p>Sports Mechanics</p> <ul style="list-style-type: none"> • tailor made equipment & clothing • advanced materials • technique analysis is now instant/virtual models can now be created • body position/streamline/aerodynamics is now extremely advanced <p>Socio-cultural aspects</p> <ul style="list-style-type: none"> • media coverage is now advanced/hawkeye/ultra-motion/'pocket cam'/'stump-cam'/GPS etc • interactive viewing is moving sport into the home/more accessible In the home • clothing that aids performance/high performance clothing.

(Total 25 marks)

Question Number	Indicative content
9	<p>Candidates should be given credit for more contemporary examples.</p> <p>The following are potential areas for discussion but should be backed up with relevant examples.</p> <p>Candidates should address each of the types of leader identified in the question.</p> <p>Answers can discuss training, performance and recovery where appropriate.</p> <p>Manager</p> <ul style="list-style-type: none"> • manager will adopt various styles of leadership depending upon many factors eg experience of the team, pressure of the situation/Fiedler’s Contingency • manager sets the big picture/macrocycle for the season • manager then identifies goals and strategies for the various microcycles and mesocycles/stages of the season • has a key role on motivating the team • provides coping strategies (stress/aggression) • selects specialists to work with athlete(s) where appropriate • analysis of opponents/competition <p>Coach</p> <ul style="list-style-type: none"> • access to advanced feedback methods • responsible for technique and skill work • responsible for selecting atrategies/tactics • access to qualified specialists such as: Highly qualified sports psychologists, biomechanists, physiologists, dieticians • access to training facilities, such as: <ul style="list-style-type: none"> ▪ hypoxic chambers/hydrostatic pools etc ▪ More accurate fitness assessment ▪ More precise and reliable fitness monitoring equipment/techniques ▪ Rehabilitation is quicker due to advance technology ▪ Monitoring of recovery process ▪ Controlled diet/scientifically controlled nutrition ▪ Assessment and monitoring of structural and functional adaptations is more accurate ▪ Establishment of thresholds/OBLA/Lactate threshold is more accurate ▪ Work with specific equipment/tailor made equipment & clothing ▪ More technologically advanced assessment and monitoring equipment. <p>Captain</p> <ul style="list-style-type: none"> • Responsible for maintaining focus of team • Responsible for providing example to fellow team mates • Motivator/help control players emotions • Making key decisions during performance - tactical/strategic

	<p>Other factors</p> <ul style="list-style-type: none"> • media exposure • funding/sponsorship/endorsements • styles of leadership • role models • personality types/theories <p>Conclude</p> <ul style="list-style-type: none"> • there is no definitive answer./correct style • every team and athlete is different • the role of a leader is in a state of perpetual change • successful leaders must be doing something different.
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(Total 25 marks)

Question Number	Indicative content
10	<p>There are a vast number of areas that candidate responses could address.</p> <p>Candidates should be given credit for more contemporary examples.</p> <p>The following are potential areas for discussion but should be backed up with relevant examples.</p> <p>Key Areas:</p> <p>Recovery</p> <ul style="list-style-type: none"> • one of the most important considerations is rest • physiologically, minor tissue repair tends to take a minimum of 48 hours ie DOMS • tissue damage due to injury ie torn ligaments tend to take a minimum of 3 weeks and this appears to be physiologically similar for most athletes • various scientific/technological advances in terms of treatment/use of ultrasound etc • use of weight bearing technologies so athlete can begin light training as soon as possible <p>Prevention</p> <ul style="list-style-type: none"> • appropriate training techniques and practices to reflect the activity • physical conditional is essential for example strength training to prevent the development of imbalances between antagonistic pairs of muscle(s)/muscle groups • technique work in order to emphasise correct patterns of movements and develop the correct motor programmes/schema/responses • appropriate warm up/cool down is an area for debate - recent studies suggest there is no beneficial effect in terms of injury prevention - this research is controversial • protective clothing • athlete education

(Total 25 marks)

Mark Band	Description	Likely Characteristics
22 - 25	The essay synthesises information from all relevant study areas to answer the question in full. There is some in-depth analysis and balanced debate of the issues with correct use of technical language and factual information throughout, demonstrating a clear understanding of the subject matter. A range of accurate practical examples predominantly taken from relevant scientific units supports the vast majority of points.	A well structured essay with continuous prose. Predominantly accurate use of spelling, punctuation and grammar. Correct use of terminology. Clear, concise and relevant throughout.
18 - 21	The essay synthesises information from most of the relevant study areas to address the key issues raised in the question. A good understanding is demonstrated through a good use of technical language, some detailed analysis and balanced debate of key points. Factual information and accurate examples, many taken from relevant scientific units , are used in support of points made.	A well structured essay with predominantly accurate use of spelling, punctuation and grammar. Correct use of terminology. Clear and concise but may occasionally make an irrelevant comment.
14 - 17	The answer synthesises information from a limited number of study areas in an attempt to address the key issues raised in the question. A sound understanding is demonstrated through the use of some technical language , factual information and relevant practical examples , some of which are taken from scientific units. Some analysis and debate is evident, although this may be lacking both in depth and balance .	An obvious attempt to structure the essay. Fundamentally sound use of terminology. Generally clear and concise with limited inaccuracies. Satisfactory spelling, punctuation and grammar.
10 - 13	An essay that addresses a limited number of key issues but lacks the depth of synoptic rigour required. There is little evidence of analysis and technical language , although some basic understanding of the subject area is demonstrated. Relevant points may be supported by examples but only partially developed.	A basic structure is evident. Some incorrect use of terminology. There may be errors in spelling, punctuation and grammar. A number of inaccuracies.
7 - 9	An essay that fails to address many parts of the question . There is little evidence of synoptic analysis with sweeping statements that may contain some relevant information but generally remain unsupported by evidence or accurate examples and suggest limited understanding. Irrelevant points and repetition may be used to pad out the answer.	A poorly structured essay in which there may be errors in spelling, punctuation and grammar. Incorrect use of terminology. A significant proportion of material is irrelevant.
0 - 6	An essay that mostly fails to address the question and contains many inaccuracies and irrelevancies . Very little evidence of synoptic analysis with statements that demonstrate a lack of understanding.	A poorly structured essay. Incorrect spelling, punctuation and grammar. Incorrect use of terminology. Many inaccuracies.

