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Examiners' Report

June 2010

GCE Physical Education 6PE03

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Introduction

On the whole candidates seem to have found the paper accessible both in terms of the style of questions set and also the time allocation. This is clearly evidenced by the absence of blank answers to questions or incomplete papers. All of the structured questions were scored as maximum mark answers by some candidates, indicating that the questions reflected the syllabus accurately. This also indicated that where candidates struggled to answer these questions that it was perhaps as a result of a lack of preparation or understanding.

The two longer questions were not answered particularly well by the majority of candidates but for very different reasons. Answers to question 5 contained sufficient information to suggest that candidates had an understanding of the subject area. However they were either vague, contained unsubstantiated points or simply lacked the detail required at AS level.

By contrast it was clearly evident that a great many candidates simply lacked an understanding or had not covered what the Long Term Athlete Development Plan was.

Question 1

This question required candidates to explain that fats should be low, carbohydrates high and protein moderate to low. Both athletes need carbohydrates, the endurance athlete to train and perform, the power athlete to train. Both need protein for recovery and some growth. The mark scheme allowed for some variation in the percentages given, protein was the area that more candidates had difficulty with.

Answer ALL questions.

- 1 Correct nutrition is essential for any elite performer.

Name the **three** food groups that can produce energy. For each food group state, and give reasons for, the approximate percentages required by **either** a power athlete **or** an aerobic athlete.

Carbohydrates, proteins and fats are the main food groups that produce energy. Carbohydrates are our first source of energy and allow us to work ~~aerobically and anaerobically~~ aerobic.

A power athlete would need approximately 20% carbs. This is because power athletes need short sharp energy which carbohydrates release quickly but need other food groups such as protein more to repair cells and growth due to miniature tears in the muscle fibres (protein 45%). Fats would play approx 20% required by this athlete because due to his speed of his event fat is not used as much to produce the energy as the carbs and proteins are generally the only energy sources predominately used. The rest would incorporate the other supplements - minerals, water etc.



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Examiner Comments

This answer score 4 marks the candidate has identified the three food groups and then just scores one mark for the correct identification that fat percentage is correct for a power athlete



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Examiner Tip

Don't forget to check that you have named an example if required in the question

Question 2a

Though many candidates did describe cognitive and somatic anxiety many dropped marks by not explaining their effect on sporting performance. Most candidates were able to link cognitive to mental aspects of anxiety and somatic to physical aspects.

This was a typical answer given

2 (a) Explain the effects on sporting performance caused by cognitive and somatic anxiety.

(5)

Cognitive anxiety is when you believe in your mind that you are going to do badly, which in turn leads you to think negatively about the task, making you anxious, & more likely to make a mistake.

Somatic anxiety is the physiological effects, such as 'butterflies' in your stomachs, or a raised heart rate & sweating. This can cause a problem as then you are too focused on the physiological effects that it affects your performance.



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Examiner Comments

This answer scores two marks and was typical of a large numbers of responses in the exam, the candidate has correctly applied cognitive anxiety to psychological symptoms and somatic linked to physiological symptoms



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Examiner Tip

Using headings from the question is a good idea

Question 2b

Candidates either knew this area and scored well or seemed to have limited understanding and spoke about the presence of others and did not focus on the element of evaluation.

(b) The presence of others can either facilitate or inhibit an athlete's performance.
Outline the theory of Evaluation Apprehension.

(4)

Evaluation apprehension is the fear of being judged. Zajonc looked at the audience effects and came up with the theory of evaluation apprehension. When there is an audience or someone watching a performer they may think ~~ed~~ they are being judged ^{or evaluated}. This could lead to an increase in arousal however too much arousal can result in a decrease in performance (catastrophe theory). Therefore the evaluation Apprehension theory is the fear of being judged. (Total for Question 2 = 9 marks)

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Examiners Comments

Candidate scores 2 marks.

Fear of being judged is point 2 on mark scheme but then this is also repeated twice more. And point 3 given - lead to increase in arousal

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Examiners Tip

Using bullet points or numbered responses can help prevent candidates repeating points

Question 3

If candidates could identify the two phases of recovery then it was straightforward to pick up marks. Good techniques involved using the stages as headings and then developing at least 4 points for each stage. The questions asks candidates to explain the processes that restore the body - so simply listing terms like EPOC and DOMS was not enough to pick up marks

Here is an example of a better answer to this question

3 It is desirable for an athlete to recover fully between training sessions.

Explain the physiological processes that restore the body to its pre-exercise state.

EPOC - Excess Post-exercise Energy Consumption is associated with recovery. It has two components - fast component (alactic) and slow component (lactic) and its role is to restore the body to its pre-exercise state and pay the oxygen debt.

Fast component is about restoring the body's phosphogen stores ATP (Adenosine Triphosphate) and PC (Phosphocreatine) and can take roughly 4 minutes. ~~100%~~ 1 sec 99% PC store replenish

The slow component is about rehydration, energy replenishment, thermoregulation and the break down of Lactic acid.

In this component ATP is fully replenished (3 seconds worth) electrolytes levels are brought to its original state. rehydrate to allow metabolic reactions to occur and we begin to break down lactic acid. 15 minutes 1/2 lactic acid is broken down and within an hour 76% is broken down. To aid EPOC we undergo a cool down which helps our recovery and reduces the risk of DOMS (Delayed Onset of Muscular Soreness).



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Examiner Comments

Candidate scores 7 marks

Identifies both components - 2 marks
1 mark for - ATP replenishments
1 mark for - PC replenishment

1 mark - 4 mins.
1 mark - electrolytes
1 mark - lactic acid breakdown

Question 4

Most candidates identified the change in intensity and better candidates also mentioned changes in terrain. There were good descriptions of how a fartlek training programme is set out but then some failed to link their answer to a game player or stated that due to the change in terrains this was not a suitable form of training for games players. Better answers identified adaptations to energy systems and muscle fibre types.

This was a typical response to question 4

4 Comment on the suitability of fartlek training for a games player.

Fartlek means different speeds and is very suitable for games players as it mimics the speed at which the players would be playing at with rest intervals.

E.g. Netball: Sprint for 10 metres, Jog for 40 metres and walk for 60 metres this could be incorporated into further training programme. Shuttle run for 10m for sprinting, 100 metre jog and a 1500m walk.

It can also be adapted to fit the duration and length (distance) of the game. E.g. Football last 90 minutes and Wayne Rooney runs 25 km in one football match. Fartlek training can be adapted to 90 minute run with different speeds for different distances within 25 km.

(Total for Question 4 = 6 marks)



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Examiner Comments

Scores 3 marks

- 1 Mark for different speeds
- 1 Mark for mimics the game
- 1 Mark for correct examples

This is an example of a weaker answer

4 Comment on the suitability of fartlek training for a games player.

Games players such as footballers & rugby players are constantly playing a game which can cover varying terrain, e.g. an unkempt pitch, incline and also different paces. These games are stop start for the individual player, especially rugby. Fartlek is a form of training that specialises in running, jogging, walking and sprinting over varying terrains & inclines to help aid the fitness of these performers.



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Examiner Comments

Scores 2 marks

1 mark for varying terrains

1 mark for linking to needs of sports



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Examiner Tip

Always try and give a named example if asked for

Question 5

A mix of very sound answers many scoring maximum marks - obvious that they had a good understanding of the two dimensions of achievement motivation as clearly identified in the specification - a concern was that many candidates appeared to have no knowledge of this area and scored zero marks

A maximum score answer

5 Name and explain the two dimensions of achievement motivation.

NAF (Need to avoid failure) this is usually associated with those with low self-confidence and self-esteem. Their drive is to avoid humiliation and shame and perform worst when being evaluated. They chose low-risk challenges to avoid failure.

NACH (Need to Achieve) this is usually associated with those with high levels of self-confidence and self-esteem. They take pride with high levels of success, they have no fear in failure and ~~and~~ they perform best when being evaluated.



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Examiner Comments

Scores 4 marks

Straightforward answer.

Unfortunately too many candidates gave an answer similar to this

5 Name and explain the two dimensions of achievement motivation.

Intrinsic motivation -

An inner drive to achieve a goal.
Eg wanting to beat a personal best time.

Extrinsic motivation -

Motivated to do well to achieve a reward such as prize money or a medal.



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Examiner Comments

No marks scored as candidate has used wrong definitions of achievement motivation

Question 6

Many well set out answers - often the better answer used a table to help them develop their answer. The table was followed with a list of fail/success scored well because students did not miss any elements out. The theory of attribution appears to have been well learnt. Weaker candidates could not decide and often wrote that all four factors could be attributed to both success and failure - this was only the case for effort (Internal/Unstable)

An example of a strong answer that scores maximum marks

6 Attribution theory identifies four factors that success or failure can be attributed to.

By giving examples, identify these factors and explain whether they should be used after success or failure.

Ability of the performer is an internal stable factor. This can be used after success. A coach could tell their team they won because they trained harder than the opposition and achieved a greater ability level.

Task difficulty is a stable external factor and can be used after failure. If a team lose to last seasons champions they can say 'They did well, although they lost, because the opposition are champions with winning experience'

Effort is a third factor. It's internal and unstable. ~~can be~~ if effort was poor it can be attributed to failure. a coach can tell their team a little more effort could have scored another goal to win.

~~task~~ Luck can also be attributed to failure. Eg your team kept receiving unlucky bounces of the cricket ball.

(Total for Question 6 = 8 marks)



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Examiner Comments

This candidate correctly identifies the four factors and correctly applies them to success or failure



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Examiner Tip

Identify means that candidates can be quite efficient in how much they write.

Question 7

Candidates were familiar with the definition and scored this mark. There was a big difference between better and weaker answers. Better answers gave a wide range of examples all applied and linked to improvements in performance. Weaker answers often just listed technology with no explanation of how they improved performance in elite sport

Though most candidates showed an understanding of the use of ergogenic aids, not all answered the question set fully

7 Define the term **ergogenic aid** and explain how ergogenic aids can improve performance in elite sport.

Is anything that helps to improve sporting performance.
 There are different types of ergogenic aid: technical, kit, Physiological, psychological, Nutritional
 Combined ergogenic aids enhance performance by increasing energy stores, allowing training to immitate the conditions of the competibers, Increasing aerodynamics, reducing risk of injury, and psychologically preparing athletes for world class performances.
 Creatine Supplementation - legal ergogenic aid enhancing ATP reayntheoise.
 Hypoxic chambers - Increasing red blood cells, and gaseous exchange.
 Biking helmets/shark suits - Compression - increased venous return and ineread aerodynamics/
 Streamlining.

(Total for Question 7 = 6 marks)



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Examiner Comments

This answer only scores 1 mark for definition

The examples given don't explain improvement to performance. They are simply listed.



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Examiner Tip

Read the question 2-3 times to ensure you are confident in terms of what you have to do to answer it

This is an example of a better answer to question 7

7 Define the term **ergogenic aid** and explain how ergogenic aids can improve performance in elite sport.

Ergogenic aids are supplements and technology that give a desirable improvement to performance. Ergogenic aids improve performance in elite sport by ensuring the athlete has an advantage. For example ginseng is a chemical ergogenic aid that increases the level of glucose in the blood which is desirable for an anaerobic performer. Ergogenic aids can be used to help prepare for elite competition in terms of acclimatisation where hypoxic chambers can be used. This means that the athlete is not required to travel to train. Compression clothing can be used during performance to increase blood flow and therefore oxygen to the working muscles. These can also be used to aid the recovery process along with ice baths and ice vests.

(Total for Question 7 = 6 marks)

Chemical Psychological
Mechanical



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Examiner Comments

This answer scores 5 marks
1 mark given for annotation
4 mark for correctly applying examples.

Question 8

Many of the extended answers were very descriptive - this was very true of question 8 where many candidates just listed examples of how sport science can be used in elite sport. There was often not linked to Long term preparation and there was no real debate of their use. Better answers as well as explaining a range of examples also began to discuss issues such as the link to wealth and funding and the fact that appliance of sport science may be unfair as some countries cant afford this level of support - other debates included whether there has developed an over reliance on sport science at the expense of talent and ability.

There were some good answers to this question - this one makes good use of the space available

preparation of elite sports performers.

Sport Science plays a major role in long term preparations of elite performers. They are involved in the biomechanics and technological advancements in sports e.g. East German sport science and the invention of the treadmill and hypoxic chambers and Australian Sports Scientist and the 600 Gcc bike.

Sport scientist are involved with the biomechanics with the perfect model and body angles and techniques. E.g. to test peripheral vision they have speed gates with flashing lights and cameras which ~~measure~~ detect the quickness the response of an individual is to the light. This would be very useful in ~~power~~ basketball where peripheral vision is needed e.g. Kobe Bryant.

They have computer software e.g. Prozone which can overlap the perfect model over an athletes model and work out how far the angles are, that ~~is~~ is needed for their technique to be perfect. E.g. Tiger woods and his arm ~~swing~~ swing. Or with force plates to measure the perfect height to do a quadruple twist in ice skating ~~making the difference between~~ making the difference between 1st place and 5th e.g. Evan Lysacek 1st and Stephane Lambiel 5th.

Sport Scientist are also heavily involved with technological advancements. E.g. Tae Kwon do and the sensitive pads. This pad is sensitive in particular area and when touched or kicked they bring about a higher score. But is this fair? Is it a way of gaining an unfair advantage? As this technology is only available to

countries that can afford it.

There is also the compression clothing and other suits such as the Shark Laser suit (which has now been banned for swimming) e.g. Ryan Lochte. This suit reduces drag, makes the body streamline and can take away approximately 1 second from your time. The problem with it is that not only was it for athletes that could afford it, but it took away the ~~whole~~ challenge from the sport as world records were being broken at a rate higher than before.

Sport scientists also have a role in the athletes' diet e.g. Former East Germany and the 'Supplements' it gave its athletes. They can calculate how much carbohydrates, fats and proteins are needed for an athlete, needed for their body weight, etc. the intensity of their training and how much they burn in one training session e.g. Michael Phelps consumes 12,000 ~~and~~ calories a day.

Sport scientists are the next important thing after an athlete's coach as they provide the rest to make the athlete a winner. The top performing countries USA and Australia all rely heavily on sport science, but also show the importance of sports science in their positioning at global games.



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Examiner Comments

The top of band 4 as we feel there is an attempt to develop a discussion. This is backed up with a comprehensive list of examples though not all of these are fully developed. There is a bias towards the positive use of sports science in long term preparation.



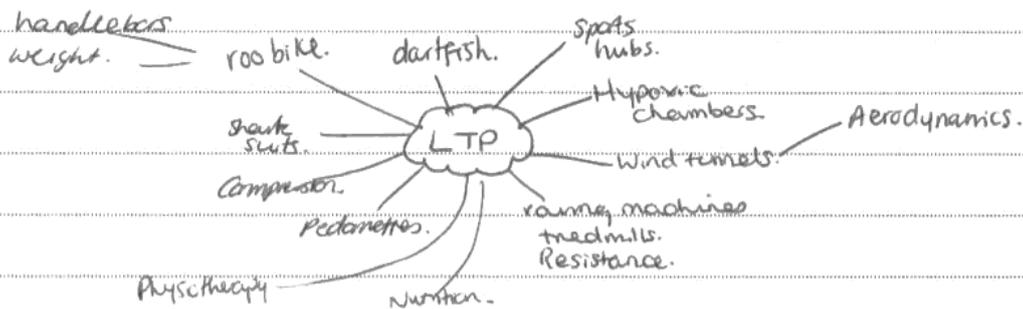
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Examiner Tip

Starting with a plan can be a good way of helping to structure your answer

*8 Success in global sport now requires good leadership and state-of-the-art scientific back up.

Discuss, using examples, the role that sports science now plays in the long term preparation of elite sports performers.



The development of sports science has ensured that the long term preparation of athletes is planned and carried out using top equipment and

Sports scientists have developed a range of training equipment such as rowing machines and treadmills which are easily accessible and monitor heart rate, distance covered, duration and speed. These machines can be altered in intensity depending on the type of training required. Further developments have led to resistance training such as swimming tide machine or wind tunnels.

These test technique and build strength and endurance against resisting force.

Simple technological advances such as pedometers or the use of GPS and google earth have allowed performers to be tracked and data collected such as distance covered, and tactics used, and this can lead to reduced social loafing because there is nowhere to hide and a refinement

in technique or development of new strategies.

Hypoxic chambers allow athletes to acclimatise to conditions with low Oxygen pressure and availability, making physiological adaptations such as increased Red blood cells, haemoglobin and myoglobin. This increased performance at sea level and ensures performance is not inhibited at high altitudes. This is needed to be used regularly due to ~~these~~ adaptations being reversible.

Sports scientists have further developed means to assess technique - slowfish for example examines movements ~~in~~ in detail and highlights areas which have reduced speed or lost points allowing coaches to help with technique refinement.

The Sharkskin swim suit, now banned for competitions, (FINA, BAO) ~~was designed to reduce friction, thus~~ enhanced performance by reducing friction, ~~as~~ compression-enhancing venous return and even trapping air to increase buoyancy decreasing body contact with the water.

Another example of sports science technical development is the Roo Bike. Light weight and extremely aerodynamic the bike gave Australia the edge until other countries bought them.

Sport scientists have revolutionised the training of elite athletes making long term adaptations before unheard of.

They have also enhanced kit for competition to the point that it

is questionable whether it's the sports person or the science that is winning gold.

Sports science also includes psychological, ~~physio~~ nutritional and medical and nutritional advances.

Psychological preparation for long term competition is important and can lead to harder competitors less phased by audiences, nervous or anxiety. If performers are taught to cope with stressful and pressurized situations ~~performance~~ long term performance will improve.

Medical support through sports ~~exercise~~ scientists include injury rehabilitation / physiotherapy and the psychological support needed to get over the injury and reach full potential.

Nutritionists have found that while training and competing varying amounts of food groups are required for energy and repair. Correct supplementation can lead to ~~an~~ much ~~&~~ improved performance.



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Examiner Comments

This answer scored 10 marks

This is going to be in band 3. It is description that is correct but not detailed

There is limited use of names examples

Never really discusses the role of sport science.

Question 9

On the whole better answers to this extended question - the suggested use of heading appeared to help candidates structure their answer and cover all the elements required. Weaker answers just listed strategies under the three headings without any explanation or discussion. Better answers gave good examples many from the FIFA World Cup in South Africa. Most gave more examples from physiological and psychological - a point centres may want to note.

This answer uses the headings from the question to help give structure and also aids the candidate in answering the question

*9 Short term preparation refers to the period prior to a competitive performance.

Using the headings **physiological**, **psychological** and **technical**, outline the strategies and considerations elite athletes take into account in their short term preparation for global games.

Physiological

In the period before a competitive ~~athletic~~ performance, an athlete needs to ensure that their body is in the right condition to perform. The athlete ~~they~~ needs to ensure nutrition is correct and that they are including the right percentages of all food groups especially carbs, fats + proteins as energy sources. The athlete also needs to maintain a level of hydration before the event because a 2% decrease in body weight through fluid loss equates to 10% performance reduction. Carbo loading may be an option to the performer if they are in an aerobic event such as a marathon in order to ~~the~~ super compensate the glycogen stores. The athlete will consider tapering their training the closer they get to the event to avoid burn out, overtraining and injury which may decrease performance. Athletes may undergo a sports massage to keep the muscles supple and relaxed to avoid any strain injuries. The athlete will need to ensure the right before that they get sufficient sleep in order to rest the body for the event ahead. The athlete will perform a warm up in order to prepare the body for exercise, increase performance + prevent

injury. This may be up to an hour long and relatively close to lunch or depending on the intensity of the warm up.

Psychological

- The player may choose the night before to relax and take their mind off the event ahead. They may choose to watch movies, play games or listen to music. These all aid the athlete reducing thoughts of anxiety creeping into their mind. If they are concerned about this then they may well perform techniques that will help to relieve this. These can be performed before the game as well. Self talk may be used in order to maintain / reinforce a high level of self confidence which would aid performance. If they are feeling anxious, they may try to use techniques which will change their perception and look at the feelings of anxiety as something enjoyable rather than something negative which would inhibit athletic performance. Yoga + Breathing exercises the night before may be used in order to relax the player and improve focus on their task. Group ~~task~~ cohesion may be improved within elite athletes by eating together and then socialising afterwards. If the player is experiencing somatic anxiety before the event, they should undergo relaxation

techniques that focus on relaxing the whole body by individually targeting each major muscle group and contracting, relaxing in order to remove muscular tension. Routines that each player may have should be performed to aid their superstitions and increase self confidence that they will perform well in the event.

Technical.

The athlete should inspect the playing surface to see what kind of footwear to wear to maintain athletic performance. If it is damp then studs per footballers may be best option. The athlete should take into account the temperature of the environment. If it is hot then perhaps an ice vest should be used to keep body temperature down. If it is cold, then the athlete may require gloves to prevent heat loss from the extremities. "Underarmor" may be worn if the conditions are cold in order to keep body temperature higher. May also be worn in hot conditions to help wick away sweat and aid evaporation so the body stays cool. Might consider wearing a heart rate monitor during the warm up to monitor when they have reached the correct intensity.



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Examiner Comments

An answer that covers a lot of ground and generally well written. Covers all 3 areas in some depth and has moved beyond simple description however there is only limited analysis and there is no conclusion.

An example of a weaker answer to question 9

*9 Short term preparation refers to the period prior to a competitive performance.

Using the headings **physiological**, **psychological** and **technical**, outline the strategies and considerations elite athletes take into account in their short term preparation for global games.

Physiological:

An athlete must consider where the global event is being held and whether they need to acclimatise to the environment.

Acclimatising to heat can take up to 14 days or quicker with athletes with a higher $\dot{V}O_2$ max. But there are 2 types of heat, humid heat which increase sweat production or dry heat which has a higher risk of dehydration. When acclimatising to heat especially with marathon runners e.g. Paula Radcliffe 2004 Olympic games in Athens, hydration planning must be top of the priority list, as it reduces the risk of dehydration and the complications that occur with it such as kidney failure.

Acclimatising to altitude takes even longer than 14 days and $\dot{V}O_2$ max has no effect on how quickly the athlete would acclimatise. It is important for the athlete to decide whether to live high and train low as that has proven benefit and allows the athlete to maintain their training intensity ^{and} fitness levels e.g. Lance Armstrong 2009 Tour de France 2nd Place.

Diet is also important. If the athlete needs to carb-load they have to do so ~~within~~ within 7 days before the event. They need to maintain their electrolyte levels and increase their protein ~~intake~~ intake to aid with repair and muscle growth. Taking supplements which have been agreed with WADA should be on the agenda as it gives a legal advantage.

Psychological

~~Performance profiling~~ Performance profiling is where to start and this gathers the athletes strengths and weaknesses (heaps and wagon wheel) and where they can improve on. Goal setting focuses the athlete. Having short and long term goals and outcome, process and performance goals would allow the athlete to see what they want to see come out of the global event. Using the SMARTER principles makes the goals more specific.

Controlling arousal and anxiety levels especially with athletes that are prone to choking is very important. Undergoing imagery and visualisation would allow the athlete to see what they want the outcome to be. Listening to music e.g. Michael Phelps is seen to calm and relax athletes. Self talk is also known to build and boost confidence levels.

Increasing self-efficacy (Bandura 1977) is another important thing. General praise from significant others increases self-confidence. Vicarious experiences and watching others is also known to help with self-efficacy.

If an athlete tends to be aggressive apply the social learning theory (Bandura 1977) that aggression is learnt by watching others. ~~For~~ To decrease aggression is by punishment or displaying non-aggressive behaviour. E.g. Mike Tyson biting opponent Erason's ear off.

Technical:

~~Acclimatisation~~ whether the athlete would require a hypoxic chamber for altitude or an environmental chamber for all the types of environments e.g. Tour de France. ^{use various environments} Using these also allows the athlete to remain in their home country and decrease the risk of jet lag. Using heart rate monitors allows the athlete to know which level of threshold they're working in either aerobic (60-80%) or anaerobic (80-100%) and to allow the necessary adaptation.

In team games such as World Cup & C10. Using Dart fish would allow feedback, it would show team positionings and marking useful for ~~analysis~~ tactics e.g. set play or applying decision making. For individual sports e.g. athletic Usain Bolt using ~~the~~ Pizzone would show the perfect model in terms of techniques and biomechanics which would increase performance.

Another important factor is the type of clothing to fit wind, climate heat etc. Compression clothing by Nike worn by Cathy Freeman gold medalist 400m works with aerodynamics and streamlines the muscles. It can be worn from athletics to cyclist to skier e.g. ~~Lyndsay Kerr~~ Lyndsay Kerr.

Equipment is another important aspect. e.g. Different football turfs require different spike e.g. John Terry. ~~in~~ In athletics the athlete usually has hand made shoes specific to them. ~~equipment~~



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Examiner Comments

This answer scores at the bottom of band 4. Disappointing as aspects are band 5 but too much of the psychology section is long term and the question specifically identifies the phase prior to competition. There are good examples and points made in the physiological and technical sections. There is no attempt at a conclusion.

Although seemingly an obvious statement to make, candidates that had been well prepared by their centres scored well. Generalisations and a failure to specifically answer the questions set were the main reasons for candidates scoring low marks. Pleasingly more and more candidates seem to be increasingly better prepared for the exam, they have a clearer understanding of what they have to do in order to access the marks allocated per question. Centres that rely on distributing past papers to candidates as their main form of examination preparation still have candidates struggling to access the lower grade boundaries.

Grade Boundaries

| Grade | Max. Mark | A* | A | B | C | D | E | N |
|-----------------------------|-----------|----|----|----|----|----|----|----|
| Raw boundary mark | 90 | 65 | 60 | 55 | 51 | 47 | 43 | 39 |
| Uniform mark scale boundary | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 |

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