



*Rewarding Learning*

**General Certificate of Secondary Education  
2012**

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## **Physical Education**

**[G9741]**

**WEDNESDAY 23 MAY, AFTERNOON**

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# **MARK SCHEME**

			AVAILABLE MARKS
<p><b>1</b> The three parts of health are the physical, mental and social. Award [0] for an answer not worthy of credit. Award [1] for each correct part of health. (3 × [1])</p>	[3]		3
<p><b>2 (a)</b> We need to eat food: E.g.</p> <ul style="list-style-type: none"> <li>• for growth and repair</li> <li>• to provide substances to regulate the processes of the body</li> <li>• to provide energy for physical activity.</li> </ul> <p>Award [0] for an answer not worthy of credit. Award [1] for an acceptable answer.</p>	[1]		
<p><b>(b)</b> Saturated fat, polyunsaturated fat or monounsaturated fat Award [0] for an answer not worthy of credit. Award [1] for each acceptable answer. (2 × [1])</p>	[2]		3
<p><b>3 (a)</b> Nicotine E.g.</p> <ul style="list-style-type: none"> <li>• constricts the blood vessels.</li> <li>• raises the heart rate.</li> <li>• raises blood pressure.</li> <li>• speeds up metabolism.</li> <li>• combined with carbon monoxide, leads to clotting of the blood and clogging of the arteries.</li> </ul> <p>Award [0] for an answer not worthy of credit. Award [1] for each acceptable answer. (2 × [1])</p>	[2]		
<p><b>(b)</b> Tar E.g.</p> <ul style="list-style-type: none"> <li>• carries irritants that narrow the bronchioles (small tubes) of the lungs.</li> <li>• carries irritants that irritate the delicate mucus membrane lining the air passages, causing them to produce more mucus.</li> <li>• carries irritants that damage the cilia (small hairs lining the air passages) that help protect the lungs from dirt and infection.</li> <li>• carries the carcinogens that can cause cancer.</li> </ul> <p>Award [0] for an answer not worthy of credit. Award [1] for each acceptable answer. (2 × [1])</p>	[2]		4
<p><b>4</b> Harmful effects that too much alcohol can have on a sportsperson's performance: E.g.</p> <ul style="list-style-type: none"> <li>• loss of coordination.</li> <li>• loss of balance.</li> <li>• poor information processing</li> <li>• poor judgement and decision making</li> <li>• slowed reflexes/reaction time</li> <li>• distorted vision</li> <li>• nausea</li> </ul> <p>Award [0] for an answer not worthy of credit. Award [1] for each acceptable answer. (2 × [1])</p>	[2]		2

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<p><b>5</b> Rest is a period of time when you consciously try and get the mind and/or body to be inactive. Sleep is a time of rest during which consciousness of the world is suspended. Award [0] for an answer not worthy of credit. Award [1] for explaining clearly either rest or sleep. Award [2] for explaining clearly both rest and sleep. (2 × [1])</p>	[2]	2
<p><b>6 (a)</b> Regular and appropriate exercise can reduce the risk of suffering from: E.g.</p> <ul style="list-style-type: none"> <li>• a heart attack</li> <li>• angina</li> <li>• arteriosclerosis (build up of fatty deposits in the arteries)</li> <li>• obesity</li> <li>• osteoporosis (brittle bones)</li> </ul> <p>Award [0] for an answer not worthy of credit. Award [1] for each acceptable answer. (2 × [1])</p>	[2]	
<p><b>(b)</b> Regular and appropriate exercise can help with: E.g.</p> <ul style="list-style-type: none"> <li>• weight control</li> <li>• posture</li> <li>• self-confidence</li> <li>• controlling negative habits such as smoking, drugs or alcohol</li> <li>• rest and sleep</li> <li>• relieving stress</li> <li>• extending a healthy active life</li> </ul> <p>Award [0] for an answer not worthy of credit. Award [1] for each acceptable answer. (2 × [1])</p>	[2]	4

7 (a)

Table 1

Physical tasks	
Marathon	
High jump	✓
Shot put	✓
20 km walk	
Javelin	✓

Award [0] for an answer not worthy of credit.

Award [1] for each correct answer.

(3 × [1])

[3]

(b) (i) Flexibility allows people to bend, stretch, twist and turn easily.

Award [0] for an answer not worthy of credit.

Award [1] for an acceptable answer that explains what flexibility allows.

[1]

(ii) A person's flexibility is determined by the ability of the muscles and ligaments surrounding joints to stretch to allow the full range of movement at the joints.

Award [0] for an answer not worthy of credit.

Award [1] for an answer that partially explains what determines a person's flexibility.

E.g. A person's flexibility is determined by the ability of the muscles to stretch.

Award [2] for an answer that clearly explains what determines a person's flexibility.

E.g. A person's flexibility is determined by the ability of the muscles and ligaments surrounding joints to stretch to allow the full range of movement at the joints.

[2]

(c) I would choose muscular endurance as being most important.

Most physical tasks at work, even physical work done by farmers, refuse collectors etc., require mostly muscular endurance. There are very few jobs today that require consistently high intensity efforts throughout the day.

Most everyday tasks done about the house and garden such as mowing the lawn, vacuuming the carpets, shopping require mostly muscular endurance. High intensity efforts such as lifting heavy objects or sprinting for a bus are not performed very often and therefore muscular power would not be as important.

Most recreational activities that you can do in your leisure time would be aerobic activities and therefore require mostly muscular endurance.

Award [0] for an answer not worthy of credit.

Award [1] for choosing muscular endurance as being the most important.

Award [2] for choosing muscular endurance as being the most important and providing one acceptable point to explain why.

Award [3] for choosing muscular endurance as being the most important and providing two acceptable points to explain why.

[3]

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<p><b>8</b> Fartlek training involves continuous training but includes working the body at high intensities for varying periods of time. Periods of high-intensity work are followed by periods of recovery. The intensities and the times for which they are maintained are decided during the training, depending on how the person feels, or as directed by a coach.</p> <p>Award [0] for an answer not worthy of credit. Award [1] for an answer that partially explains what fartlek training involves, e.g. Fartlek training involves working the body at high intensities for varying periods of time. Award [2] for an answer that explains reasonably well what fartlek training involves, e.g. Fartlek training involves continuous training but includes working the body at high intensities for varying periods of time. Periods of high-intensity work are followed by periods of recovery. Award [3] for an answer that explains comprehensively what fartlek training involves, e.g. Fartlek training involves continuous training but includes working the body at high intensities for varying periods of time. Periods of high-intensity work are followed by periods of recovery. The intensities and the times for which they are maintained are decided during the training, depending on how the person feels, or as directed by the coach.</p>	[3]	3
<p><b>9 (a)</b> Interval training involves alternating periods of high intensity work with periods of recovery. The intensity, recovery time and number of repetitions are normally decided in advance.</p> <p>Award [0] for an answer not worthy of credit. Award [1] for an answer that partially explains what interval training involves, e.g. Interval training involves alternating periods of high intensity work with periods of recovery. Award [2] for an answer that explains comprehensively what interval training involves, e.g. Interval training involves alternating periods of high intensity work with periods of recovery. The intensity, recovery time and number of repetitions are normally decided in advance.</p>	[2]	
<p><b>(b)</b> To make an interval training workout harder you can:</p> <ul style="list-style-type: none"> <li>• increase the intensity of the work period</li> <li>• shorten the recovery period</li> <li>• increase the number of repetitions.</li> </ul> <p>Award [0] for an answer not worthy of credit. Award [1] for each acceptable answer. (2 × [1])</p>	[2]	4

- 10 (a)** Kg is the abbreviation for kilogram which is a metric unit of weight.  
Award [0] for an answer not worthy of credit.  
Award [1] for kilogram. [1]
- (b)** RM is the abbreviation for Repetition Maximum and is the maximum weight that can be lifted a certain number of times. For example, 10RM is the maximum weight that can be lifted ten times but no more than ten.  
Award [0] for an answer not worthy of credit.  
Award [1] for an acceptable answer.  
E.g. RM is the maximum number of times a weight can be lifted.  
Award [2] for a comprehensive answer.  
E.g. RM is the abbreviation for Repetition Maximum and it is the maximum weight that can be lifted a certain number of times, e.g. 10RM is the maximum weight that can be lifted 10 times, but no more than 10. [2]
- (c)** A repetition or one repetition means the exercise is performed once.  
Five repetitions means the exercise will be performed five times.  
Award [0] for an answer not worthy of credit.  
Award [1] for an acceptable answer.  
E.g. Repetitions are the number of times an exercise is performed.  
Award [2] for a comprehensive answer.  
E.g. A repetition or one repetition is the exercise performed once. Five repetitions means the exercise will be performed five times. [2]
- (d)** A set is the number of continuous repetitions completed before a significant rest is taken.  
Award [0] for an answer not worthy of credit.  
Award [1] for an acceptable answer.  
E.g. A set is a number of repetitions.  
Award [2] for a comprehensive answer.  
E.g. A set is the number of continuous repetitions completed before a significant rest is taken. [2]

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- 11 (a) Everyday physical tasks could be, for example:
- walking to work; walking to the shops etc.
  - washing a car
  - vacuuming the house
  - ironing
  - climbing the stairs
  - mowing/cutting the grass
  - digging/weeding/hedge clipping in the garden etc
  - cleaning house windows
  - dusting the house
  - carrying shopping bags
  - playing with children
  - walking the dog

Award [0] for an answer not worthy of credit.

Award [1] for each acceptable answer.

(2 × [1])

[2]

(b) **Principle of specificity**

The type of exercise done and the training methods used should match, as much as possible, the physical fitness demands of the team game, e.g. hockey.

**Aerobic/anaerobic considerations**

E.g.

Hockey requires the players to be continuously moving and, when needed, to put in bursts of sprinting. The type of exercise therefore done in training should be mostly running as this is required a lot in the game of hockey.

Variations of fartlek and interval training should be used as these match the continuous running that is needed in the game but with frequent bursts of sprinting being also required.

**Muscular power/strength/speed and endurance considerations**

E.g.

Hockey also requires players to have strong legs for lunging, stopping suddenly, starting suddenly and turning suddenly and strong upper bodies and arms for tackling and passing. This means circuit training or weight training that target core strength and the requirements mentioned should be included in the training.

**Flexibility**

E.g.

Hockey requires its players to be able to bend, stretch, twist and turn easily, therefore, suitable static and dynamic flexibility exercise should be included in the training.

Award [0] for an answer not worthy of credit.

**Level 1 ([1]–[2])**

The answer has evidence that shows limited understanding. The quality of written communication is basic. There is limited use of specialist terms and the spelling, punctuation and grammar are weak.

**Level 2 ([3]–[5])**

The answer has a range of evidence that shows reasonable understanding. The quality of written communication is moderate to good. A range of specialist terms is used with facility and the spelling, punctuation and grammar are reasonably good.

**Level 3 ([6]–[8])**

The answer has a wide range of evidence that shows sound understanding. The quality of written communication is very good. A wide range of specialist terms is used adeptly and the spelling, punctuation and grammar are almost faultless.

[8]

10

- 12** Fitness testing which is relevant for a specific sport allows the players to:  
E.g.
- judge their levels of fitness before they begin their training programmes
  - discover their strengths, weaknesses and areas for improvement
  - set realistic short-term and intermediate goals/targets
  - stay motivated
  - judge the progress being made by them during the training programme
  - adjust their training programme in light of the information gained from the assessments.

Award [0] for an answer not worthy of credit.

**Level 1 ([1]–[2])**

The answer has evidence that shows limited understanding. The quality of written communication is basic. There is limited use of specialist terms and the spelling, punctuation and grammar are weak.

**Level 2 ([3]–[4])**

The answer has a range of evidence that shows reasonable understanding. The quality of written communication is moderate to good. A range of specialist terms is used with facility and the spelling, punctuation and grammar are reasonably good.

**Level 3 ([5]–[6])**

The answer has a wide range of evidence that shows sound understanding. The quality of written communication is very good. A wide range of specialist terms is used adeptly and the spelling, punctuation and grammar are almost faultless.

[6]

6

- 13** As a result of regular aerobic endurance training the slow twitch muscle fibres get an increased network of **capillaries**.

This increased network means more **oxygen** and **nutrients (food)** can be delivered to the slow twitch muscle fibres and more waste **products (carbon dioxide and water)** taken away.

Award [0] for an answer not worthy of credit.

Award [1] for each acceptable answer.

(4 × [1])

[4]

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- 14** In hot, sunny conditions minimal clothing should be worn. What is worn should protect you from the sun, yet allow good circulation of air. Materials used should absorb sweat and wick it away from the body. A suitable hat/cap may be worn. For example, if you were running in hot conditions you would wear shorts and running vest or 'T' shirt which protects you from the sun and wicks your sweat away from the body. In the mountains you could wear a lightweight shirt and trousers that wick sweat away from the body, are quick drying and have anti-bacterial properties.

In cold, wet conditions layering is important to protect you. The inner layer should absorb sweat and take it away from the skin. The mid layer should keep you warm and the outer layer should keep you dry. For example, for running in cold, wet conditions you could wear specialist running tights/bottoms to keep your legs warm, a long sleeved inner layer to wick your sweat away from your skin; a fleece to keep you warm and a waterproof, breathable jacket. In the mountains the principle is the same. The inner layer should keep you warm but wick sweat away from your body; the mid layer should keep you warm. You could have lined trousers and layers of fleeces and finally windproof, waterproof, breathable overtrousers and mountaineering jacket.

Award [0] for an answer not worthy of credit.

**Level 1 ([1]–[2])**

The answer has evidence that shows limited understanding. The quality of written communication is basic. There is limited use of specialist terms and the spelling, punctuation and grammar are weak.

**Level 2 ([3]–[4])**

The answer has a range of evidence that shows reasonable understanding. The quality of written communication is moderate to good. A range of specialist terms is used with facility and the spelling, punctuation and grammar are reasonably good.

**Level 3 ([5]–[6])**

The answer has a wide range of evidence that shows sound understanding. The quality of written communication is very good. A wide range of specialist terms is used adeptly and the spelling, punctuation and grammar are almost faultless.

[6]

6

- 15 Enjoyment is the act of receiving pleasure from something.  
Success is when an outcome has been favourably achieved.

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All teenagers should have experienced Physical Education during their time at school. Within PE they would have experienced a range of different physical activities, for example, athletics, gymnastics, dance, various games and swimming. In schools, there are also usually opportunities to participate in school based physical activities outside of the normal timetabled school day.

If, from the teenagers' experiences, the teenagers enjoy participating in some physical activities then they are more likely to want to continue in these physical activities outside the school and when they leave school. On the other hand if they found that they disliked some physical activities as a result of their experiences then they are unlikely to want to participate in them after school, outside school or when they leave school.

If the teenagers enjoy participating in a physical activity, they are likely to continue to participate in the activity. If they are successful at the physical activity and show ability to do well then they are even more likely to keep participating and become committed participants. On the other hand teenagers may enjoy the physical activity but if they find that they have difficulty and are not very successful at the physical activity then they are more likely to give it up.

Award [0] for an answer not worthy of credit.

**Level 1 ([1]–[2])**

The answer has evidence that shows limited understanding. The quality of written communication is basic. There is limited use of specialist terms and the spelling, punctuation and grammar are weak.

**Level 2 ([3]–[5])**

The answer has a range of evidence that shows reasonable understanding. The quality of written communication is moderate to good. A range of specialist terms is used with facility and the spelling, punctuation and grammar are reasonably good.

**Level 3 ([6]–[8])**

The answer has a wide range of evidence that shows sound understanding. The quality of written communication is very good. A wide range of specialist terms is used adeptly and the spelling, punctuation and grammar are almost faultless. [8]

8

Table 2

Weight training to improve strength	Option 1	Option 2	Option 3
Weight	3RM	15RM	<b>80% of 1RM</b>
Number of repetitions	<b>7 repetitions</b>	4 repetitions	14 repetitions
Number of sets	2 sets	<b>3 sets</b>	5 sets

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- (a) For improving muscular strength, it is recommended that the weight should be between 6–12 RM or 70–84% of 1RM. Option 1 is 3RM and is therefore too heavy and more suited to improving muscular power. Option 2 is 15RM and is therefore too light and more suited to developing muscular endurance. Option 3 is 80% of 1RM. It is within the recommended weight range for improving muscular strength and therefore this option is the most suitable. Award [0] for an answer not worthy of credit. Award [1] for each answer that explains correctly why each of the options is suitable or not suitable for improving muscular strength. (3 × [1]) [3]
- (b) With a suitable weight for improving muscular strength, the number of repetitions is recommended as being between 6–12. Option 1 has 7 repetitions. It is within the recommended range and suited to the weight of 80% of 1RM as it is heavy. Option 2 has 4 repetitions. This is outside the recommended range of repetitions for improving muscular strength and this option is more suitable with a weight for improving muscular power. Option 3 has 14 repetitions. This is outside the recommended range of repetitions for improving muscular strength and this option is more suitable with a weight for improving muscular endurance. Award [0] for an answer not worthy of credit. Award [1] for each answer that explains correctly why each of the options is suitable or not suitable for improving muscular strength. (3 × [1]) [3]
- (c) With a suitable weight and number of repetitions for improving muscular strength, it is recommended that the number of sets done should be between 3–4. Option 1 has 2 sets. This is outside the recommended range of sets for improving muscular strength and with an appropriate weight and number of repetitions is more suited for improving muscular endurance. Option 2 has 3 sets. This is within the range of sets for improving muscular strength and I would choose this option. Option 3 has 5 sets. This is outside the recommended range of sets for improving muscular strength and with an appropriate weight is more suited to improving muscular power. Award [0] for an answer not worthy of credit. Award [1] for each answer that explains correctly why each of the options is suitable or not suitable for improving muscular strength. (3 × [1]) [3]
- (d) The weight I would choose to improve **muscular endurance** would be **15 RM**. Award [0] for an answer not worthy of credit. Award [1] for all choices being correct. [1]

17 (a) Table 3 below clearly demonstrates a sound understanding of the principles of variety and progressive overload being applied effectively to the aerobic component over the phases of the health-related exercise programme.

Table 3

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Current activity level	CSP Walk at 60% MHR for 30 min	X	X	X	X	X	CSP Walk at 70% MHR for 20 min
Weeks 1–3	CSP Walk at 70% MHR for 30 min		CSP Swim at 70% MHR for 20 min				CSP Walk at 70% MHR for 30 min
Weeks 4–6	CSP Walk at 70% MHR for 40 min		CSP Swim at 70% MHR for 30 min		CSP Cycle at 70% MHR for 30 min		CSP Walk at 70% MHR for 30 min
Weeks 7–9	CSP Walk at 70% MHR for 50 min		CSP Swim at 70% MHR for 30 min	CSP Run at 70% MHR for 20 min	CSP Cycle at 70% MHR for 40 min		CSP Walk at 70% MHR for 30 min
Weeks 10–12	CSP Walk at 70% MHR for 60 min		CSP Swim at 70% MHR for 40 min	CSP Run at 70% MHR for 30 min	CSP Cycle at 70% MHR for 40 min	Dance at 70% MHR for 20 min	CSP Walk at 70% MHR for 30 min

Award [0] for an answer not worthy of credit.

Award [1] for each phase (e.g. Weeks 4–6) if it is partially correct in its application of the principles of variety and progressive overload

Award [2] for each phase (e.g. Weeks 4–6) if in theory the application of the principles of variety and progressive overload are correct but may not be totally practical.

Award [3] for each phase (e.g. Weeks 4–6) if the application of the principles of variety and progressive overload are correct, effective and practical.

(4 × [3])

[12]

**(b) Principle of variety**

To clearly apply the principle of variety to the exercise programme, a new aerobic activity was introduced into each of the four phases.

*Principle of progressive overload*

To clearly apply the principle of progressive overload, between two and four of the variables were increased in each phase.

As the exercise programme was for health, the variables that were prioritised for increasing were the frequency of exercise per week and the time spent exercising in each workout. The intensity was maintained at 70% MHR.

Award [0] for an answer not worthy of credit.

Award [1] for an answer that is limited in its explanation of the pattern used to apply the principles of variety and progressive overload over each of the phases.

Award [2] for an answer that explains a sound pattern used to apply the principles of variety and progressive overload over each of the phases.

Award [3] for an answer that clearly explains a sound pattern used to apply the principles of variety and progressive overload over each of the phases.

[3]

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**Total**

**100**