GCSE MARKING SCHEME

SUMMER 2024

PHYSICAL EDUCATION - COMPONENT 1
SHORT COURSE
C555U10-1

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

GCSE PHYSICAL EDUCATION

COMPONENT 1 (SHORT COURSE)

SUMMER 2024 MARK SCHEME

Number		Answer	AO1	AO2	AO3	Total Mark
1	(a) (i)	**Identify the main component of fitness needed by the sprinter at the <u>start</u> of a 100m race.** Answer key: B - Reaction Time	1			1
	(a) (ii)	**Justify your reasons for choosing the component in 1 (a) (i) above.** **AWARD** Max 1 mark for ***knowledge*** of Reaction Time Responding to stimulus quickly 1 mark for application for correctly justifying how Reaction Time is used by the sprinter to get a good start. React quickly Get out of the blocks quickly Respond to the gun		2		2
	(b) (i)	**Identify the main type of muscle fibre used by the sprinter during a 100m race** **AWARD** 1 mark for FAST TWITCH / TYPE II	1			1
	(b) (ii)	**Justify your reasons for the muscle fibre identified in (b) (i)** 2x1 marks for **WHY:** • Contracts quickly ***THEREFORE*** *allowing the sprinter to run quickly / with high leg speed.* • Explosive / powerful / high force of contraction ***THEREFORE*** *allowing the sprinter to exert more power / force to run a fast time.* • Anaerobic / do not use oxygen **THEREFORE** *allowing the sprinter to work at high / maximal intensity.* • Fatigue quickly ***THEREFORE*** *sprinter will complete the 100m in a short period of time (less that 15 seconds).*		2		2
	(c) (i)	Identify, using Figure 2, the training zone a 16-year-old sprinter would train in to improve speed. **AWARD** 1 mark for Training Zone B Answer key: B - Training Zone B	1			1

Number		Answer	AO1	AO2	AO3	Total Mark
	(c) (ii)	**Explain why the training zone chosen in 1 (c) (i) is important for the improvement of sprint athletes.** **AWARD** 1 mark for basic explanation e.g. anaerobic / high intensity. 2 marks for detailed explanation e.g. specific reference to heart rates. 3 marks for a developed explanation e.g. energy systems. **Indicative content** • Anaerobic / High Intensity *(required when developing speed and power*). • HR must be above 80% MHR/ • HR in the range of 163-204bpm. • Allows the ATP-PC energy system to be used / trained *(specific energy system for a sprinter).* • Can cause the build-up of lactic acid which results in fatigue. Training Zone A is the aerobic zone **THEREFORE** ineffective for improving speed /power / anaerobic fitness.		3		3
	(d) (i)	**Name the main energy system that would be used by a 100m sprinter** **AWARD** 1 mark for ATP-PC (Alactic System)	1			1
	(d) (ii)	**Explain two reasons why this system would be used by a 100m sprinter.** **AWARD** 2 x 1 marks for: • (Very) High / maximal / explosive / anaerobic intensity. • Short Duration (of up to 10 secs).		2		2

Number		Answer	AO1	AO2	AO3	Total Mark
2	(a) (i)	**Identify the part of the heart labelled A** **AWARD** 1 mark for **RIGHT ventricle.**	1			1
	(a) (ii)	**Define the terms below, and identify average resting values for each.** **AWARD** 2x1 marks for each correct definition 2x1 marks for each correct resting value **-** Any value within the range identified can be awarded. "HR = the number of times the heart beats in one minute" Resting Value = 60-80bpm "SV = the volume of blood pumped out of the heart each beat" Resting Value = 70-90ml	4			4
	(b)	**Explain, using a sporting activity of your choice, what happens to the heart rate during exercise, and how this benefits performance.** **AWARD** 1 mark for heart rate **increases** (proportionally with exercise intensity) 2x 1 marks for application to **sporting example** and how it **benefits** performance. SUBMAX of 1 mark if no sporting example given when identifying benefits to performance • **Delivers more oxygen to the working muscles**, which benefits the performer in the following ways: ○ Work at a higher intensity. ○ Work for a longer duration. ○ Delays fatigue. ○ Maintains skill level. **Exemplification** During a game of **tennis**, the player's heart rate will increase (1) in order to deliver more blood to the working muscles (1) which will allow the tennis player to maintain a rally for longer without getting tired and losing the point (1)		3		3

<table>
<tr><th colspan="2">Number</th><th>Answer</th><th>AO1</th><th>AO2</th><th>AO3</th><th>Total Mark</th></tr>
<tr><td>2</td><td>(c)</td><td>
Describe how the long term effects of training on the cardiovascular system will benefit the health and fitness of a sports performer.

Indicative Content

Hypertrophy of the heart (e.g., increases heart health & efficiency).
Decreased resting HR (e.g. reduces stress on the heart).
Increased resting SV (e.g., increases heart efficiency to pump out more blood per beat).
Increased maximal Cardiac Output (e.g., improves O2 delivery to working muscles).
Increase in capillary density / capillarisation (e.g. improves oxygen uptake and transportation of oxygen).
Reduces Blood Pressure (e.g. reduces stress on the heart and blood vessels and lowers risk of a stroke).
Lowers cholesterol (e.g. reduces LDL / increases HDL) / Prevents heart disease.
Improves Blood flow (e.g., reduces risk of heart attack).
Reduces risk of heart disease, stroke, diabetes (e.g. controls blood sugars, improved blood flow, heart & blood vessels under less stress due to their improved efficiency).
Improves VO2 Max / CV Endurance (stamina) / aerobic fitness (e.g. increases oxygen uptake / delays fatigue / improves exercise intensity / standard of performance).
Recover quicker (e.g., removes waste products / fatiguing by products more quickly).
Live longer.

<table>
<tr><th>Band</th><th>AO1
(7 marks)</th></tr>
<tr><td>4</td><td>7 marks
Excellent description of the long-term effects of regular training that must relate to both the health and fitness benefits to the performer's CV system, with reference made to how it impacts on the performance of the performer.</td></tr>
<tr><td>3</td><td>5-6 marks
Excellent description of the long-term effects of regular training.
Maybe three effects of training described in relation to the CV system.</td></tr>
<tr><td>2</td><td>3-4 marks
Good description of the long-term effects of regular training.
Maybe two effects of training described in relation to the CV system.</td></tr>
<tr><td>1</td><td>1-2 marks
Limited description of the long-term effects of regular training.
Maybe one effect of training described in relation to the CV system.</td></tr>
<tr><td>0</td><td>0 mark
Not attempted.</td></tr>
</table>
</td><td>7</td><td></td><td></td><td>7</td></tr>
</table>

Number		Answer	AO1	AO2	AO3	Total Mark
3	(a) (i)	**Define the term Cardiovascular Endurance** **AWARD** 1 mark for correct definition "The ability to exercise for a sustained period of time" Or appropriate definition	1			1
	(a) (ii)	**Explain, using a <u>games</u> activity of <u>your choice</u>, why cardiovascular endurance is important.** **AWARD** SUBMAX of 1 awarded for explanation of importance of CV Endurance if **NO Game** identified 2x1 marks for: • Maintain a high intensity / standard of play / enhanced work rate. • Perform for a longer duration without fatigue. • Work continuously / able to keep going. • Recover more quickly within the game.		2		2
	(b) (i)	**Identify <u>one</u> method of training that could be used to develop Cardiovascular endurance.** Answer key: C - Continuous Training	1			1

<table>
<tr><th colspan="2">Number</th><th>Answer</th><th>AO1</th><th>AO2</th><th>AO3</th><th>Total Mark</th></tr>
<tr><td>3</td><td>(b) (ii)</td><td>

Analyse why <u>Fartlek</u> training might be used by a <u>games player</u> to improve performance

Description of Fartlek training
"speedplay / varying speed (intensity)

Indicative Content for analysis

Fartlek
- A form of continuous training involving changes in speed.
- Variation in intensity manipulated by speed / incline / terrain.
- Develops a range of components CV Endurance, Muscular Endurance, Speed, Power etc.)
- Develops aerobic and anaerobic fitness / energy systems.
- Specific to Games players as it reflects the demands of the game.
- Unstructured.
- Fun / enjoyable / Varied.

Examples of how fartlek training may reflect different aspects of the game should be given e.g.
Walk / slow jog – re-positioning on a set play (after a goal, centre pass, new serve etc.)
Run - counterattack scenario, support play etc.
Sprint – sprinting for the try-line, attacking space to receive the ball etc.

<table>
<tr><th>Band</th><th>AO3
(5 marks)</th></tr>
<tr><td>3</td><td>4-5 marks
Excellent analysis of fartlek training.
• The analysis provides a specific Sporting Example of how Fartlek training may reflect the demands of the game.</td></tr>
<tr><td>2</td><td>2-3 marks
Good analysis of fartlek training and its benefits over continuous training.
• The analysis provides some detail, identifying at least 2 key points from the indicative content.</td></tr>
<tr><td>1</td><td>1 mark
Limited analysis of fartlek training and it's benefits.</td></tr>
<tr><td>0</td><td>0 mark
Not attempted.</td></tr>
</table>

</td><td></td><td></td><td>5</td><td>5</td></tr>
</table>

Number		Answer	AO1	AO2	AO3	Total Mark
3	(b) (iii)	**Explain one way in which the principle of <u>overload</u> can be applied to a fartlek training session.** **AWARD** **1 mark basic explanation which may include the principles of overload.** **2 marks for a detailed explanation where the principles are expanded upon and applied to fartlek.** This is an **EXPLAIN** question and so overload needs to be specifically related to how it is applied during FARTLEK training. **Indicative content:** • Increase the number (frequency) of sprints (high intensity periods) • Increase the length / duration of sprints (high intensity periods) • Decrease the number (frequency) of walks (low intensity periods) / reduce active recovery. • Decrease the length / duration of walks (low intensity periods) / reduce active recovery. • Vary the terrain (e.g. sand). Include hills		2		2
	(c) (i)	**Identify two essential nutrients that contribute to a healthy balanced diet** **AWARD** 2x1 for any 2 of the following: • Carbohydrates • Fats • Proteins • Vitamins • Mineral	2			2

Number		Answer	AO1	AO2	AO3	Total Mark
3	(c) (ii)	**Evaluate why a marathon runner's diet will differ from that of a weightlifter.** **AWARD** 1-2marks for identifying the dietary needs of **both** the marathon runner and weightlifter. 3-4 marks for evaluating WHY each diet is beneficial to the marathon runner **and** weightlifter. **Indicative content** **Marathon Runner's Diet** • High intake of carbohydrates (pre and post exercise) (greater than 60% total calorie intake). • Complex (starchy) Carbohydrates e.g., pasta, rice, cereals etc. • Carbohydrate loading - technique to increase glycogen stores before an endurance event. **WHY** • Carbohydrates provide a major source of energy - last the duration of the event. • Complex Carbohydrates - slow release of energy over a longer period of time - last the duration of the event. • Carbohydrate loading builds up their energy stores before the event - helps to improve their performance (maintain a high intensity for longer). • Carbohydrate intake post exercise allows the marathon runner to replenish their glycogen stores which will have been severely depleted during the event - aids recovery. **Weightlifter's diet** • High Intake of protein (greater than 30% total calorie intake). • Protein rich foods e.g., red meat, chicken, eggs, pulses / beans etc. • Protein supplements to support training and recover from high intensity training e.g., protein shakes, protein bars, protein yoghurts etc. **WHY** • Protein helps to build muscle meaning they can contract with more force / greater strength. • Protein helps to repair muscle (which is broken down during high intensity resistance / strength / weight training) to help the performer recover.	1		3	4

Number		Answer	AO1	AO2	AO3	Total Mark
3	(d) (i)	**Describe what is meant by the term 'energy balance equation'** **AWARD** 1 mark for "the relationship between energy consumed (from food) and the energy output (exercise)" **or** Energy Intake = Energy Output.	1			1
	(d) (ii)	**Explain why an <u>"imbalance"</u> in the energy equation may <u>negatively</u> affect the performance of sportsperson.** **AWARD** **1-2 marks for a basic explanation of the effects of an energy imbalance on performance (may be weight to one of energy equations)** **3-4 marks for a developed explanation of the effects of an energy imbalance on performance (must mention both EQ)** Energy Intake greater than Energy Expenditure = weight gain / too much energy stored as fat Effects of weight gain on sporting performance: • Reduces speed / reduces mobility and ROM / body has to work harder which can result in early onset of fatigue/ reduces endurance. Energy Intake lower than Energy Expenditure = weight loss Effects of weight loss on sporting performance: • Insufficient energy to sustain physical activity / loss of strength.		4		4

Number		Answer	AO1	AO2	AO3	Total Mark
4	(a)	**Analyse, using Figure 4, the movement at the knee.** **AWARD** 4 x 1 mark for each of the following correct answers: **Movement at the knee joint is flexion** — False **Plane of movement is sigittal** — True **Prime-mover muscles causing the movement at the knee are the hamstrings** — False **Antagonist muscles in the movement at the knee are the quadriceps** — False **The knee is a third order lever** — True			5	5
	(b)	**Identify the correct definition for each muscular contraction** 3x1mark **Muscle Contraction** / **Description** Concentric — Muscle stays the same length whilst contracting under tension Eccentric — Muscle shortens during contraction Isometric — Muscle lengthens under tension	3			3
	(c)	**Analyse the data in Figure 5 to complete the table.** 2x1 mark **The player that showed the most improvement in their leg power** Player 2 **The player that showed the least improvement in their leg power** Player 3			2	2

	Q1	Q2	Q3	Q4	**TOTAL**
AO1	4	12	6	3	**25**
AO2	9	3	8		**20**
AO3			8	7	**15**
TOTAL	**13**	**15**	**22**	**10**	**60**