



**General Certificate of Secondary Education  
2024**

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## **Physical Education**

Paper 1

Factors Underpinning  
Health and Performance

**[G9771]**

**WEDNESDAY 22 MAY, AFTERNOON**

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# **MARK SCHEME**

## General Marking Instructions

### **Introduction**

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses.

### **Assessment objectives**

Below are the assessment objectives for Physical Education which are assessed in examination paper 1 and paper 2.

Candidates must:

- AO1** be able to recall knowledge and demonstrate understanding of the concepts, facts, terminology, principles and methods relating to the subject content;
- AO2** be able to apply effectively the concepts, facts, terminology, principles and methods relating to the subject content;
- AO3** be able to analyse, interpret and evaluate information and data relating to the subject content.

### **Quality of candidates' responses**

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

### **Flexibility in marking**

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

### **Positive marking**

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 16-year-old GCSE candidate.

### **Awarding zero marks**

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

### **Marking Calculations**

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error.

### **Types of mark schemes**

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication. Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

### **Levels of response**

Tasks and questions requiring candidates to respond in extended writing are marked in terms of levels of response. In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement. The following guidance is provided to assist examiners.

**Threshold performance:** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.

**Intermediate performance:** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.

**High performance:** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

### **Quality of written communication**

Quality of written communication is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

Level 1: Quality of written communication is basic.

Level 2: Quality of written communication is good.

Level 3: Quality of written communication is excellent.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

**Level 1 (Basic):** The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

**Level 2 (Good):** The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

**Level 3 (Excellent):** The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

1

Synovial joint	Location in the body	One movement possible at the joint
Pivot joint	<b>Neck</b>	<b>Rotation of the head from side to side</b>
Saddle joint	<b>Thumb</b>	<b>Flexion, extension, abduction, adduction, circumduction</b>
Ball and socket joint	<b>Hip; shoulder</b>	<b>Flexion, extension, abduction, adduction, circumduction</b>
Gliding joint	<b>Spine</b>	<b>Flexion, extension, rotation</b>

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

Award **[1]** for a correct location of the synovial joint in the body.

Award **[1]** for a correct possible movement at each joint.

(8 × [1])

[8]

8

2

<b>Joint</b>	<b>Right knee</b>
<b>Type of synovial joint</b>	<b>Hinge</b>
<b>Agonist</b>	<b>Quadriceps</b>
<b>Antagonist</b>	<b>Hamstrings</b>
<b>Movement at the joint</b>	<b>Extension</b>

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

Award **[1]** for correctly identifying the type of synovial joint.

Award **[1]** for correctly identifying the correct agonist muscle.

Award **[1]** for correctly identifying the correct antagonist muscle.

Award **[1]** for correctly identifying the correct type of movement at the joint.

[4]

4

3 *Example answers:*

- Voluntary muscles (skeletal muscles) are attached to bones and move limbs, for example, the biceps pull the forearm towards the shoulder. Whereas involuntary muscles are found in the internal systems, and they move various things through the body systems. For example, the blood vessels move blood through the circulatory system.
- The voluntary muscles or skeletal muscles are made up of muscle fibres and movement is under your conscious control. They form part of the somatic nervous system. Movement produced is known as voluntary movement. Whereas involuntary muscles are not under your conscious control. They are part of the autonomic nervous system. Movement is known as involuntary movement.

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

Award **[1]** for a moderate understanding of the difference between voluntary and involuntary muscles.

Award **[2]** for a clear and competent understanding of the difference between voluntary and involuntary muscles.

(2 × [2])

[4]

4

AVAILABLE MARKS

4 (a) Muscles

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

Award [1] for identifying muscles as correct answer. [1]

(b) Liver

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

Award [1] for identifying liver as the correct answer. [1]

(c) *Example answers:*

- Vasoconstriction restricts the blood flow to an area, due to the narrowing of the internal diameter of the arteries. Vasodilation increases the blood flow to an area, due to the widening of the internal diameter of the arteries. This is known as vascular shunting.
- The working muscles require 80% of the blood during exercise compared to 20% at rest. Blood flow during exercise is largely diverted to the working muscles. This is known as vasodilation. At the same time, organs such as the stomach, intestines and kidneys have a less urgent need during exercise for receiving blood and a total of 20% of blood flow is diverted. This is where oxygen is redistributed away from inactive areas, towards active areas during exercise.
- A main benefit is to allow the games player's muscles such as the quadriceps and hamstrings to gain the oxygen and nutrients they require to produce energy throughout the game. These are vital muscles that need continued energy for running, dribbling, and bending to pass or shoot the ball. The increase in the transport of oxygen and nutrients supplies the muscles with the increasing demand for oxygen as exercise intensity increases. The games player can continue to work aerobically and prevent anaerobic respiration, so the games player can work at a higher intensity for longer. Muscles require the removal of carbon dioxide as more carbon dioxide is produced during exercise, so the games player is less likely to fatigue and maintain quality performance.
- Blood is redistributed to the blood vessels near the surface of the skin which benefits the games player by reducing temperature. Heat is generated by muscles during match play. So, the redistribution of blood flow prevents overheating and dehydration for the game's player.
- During periods of high intensity, this will benefit a game's player, for example, when a midfielder must track back to defend following attack. Vasodilation will occur to ensure the required oxygen reaches the active areas. This is particularly important towards the end of the match when the games player is beginning to fatigue. Redistribution of blood through vascular shunting can ensure that the oxygen reaches the active muscles so that lactic acid is not produced throughout any period of the match.
- Vasoconstriction prevents as much oxygen getting to inactive areas such as the digestive system during exercise. During periods of rest vasoconstriction will also occur, after recovery has taken place.

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

**Level 1 ([1]–[2])**

Overall impression – basic

Basic to moderate understanding of how the redistribution of blood flow occurs at rest and during exercise and evaluation of how this process can benefit a games player during a match.

The quality of written communication is basic. The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation, and grammar may be such that intended meaning is not clear.

**Level 2 ([3]–[4])**

Overall impression – good

Moderate to competent understanding of how the redistribution of blood flow occurs at rest and during exercise and evaluation of how this process can benefit a games player during a match. The candidate uses the data in Table 3.

The quality of written communication is good. The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation, and grammar are sufficiently competent to make meaning clear.

**Level 3 ([5]–[6])**

Overall impression – excellent

A highly competent and detailed understanding of how the redistribution of blood flow occurs at rest and during exercise and evaluation of how this process can benefit a games player during a match. The candidate uses the data in Table 3.

The quality of written communication is excellent. The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation, and grammar are of a sufficiently high standard to make meaning clear. [6]

8

- 5 Type II muscle fibres are also known as **fast** twitch muscle fibres. They are designed for **explosive** sport events as they contract **quickly**. Type II muscle fibres contain a **low** content of myoglobin and a **few** mitochondria and blood capillaries. They rely on **anaerobic** respiration for the release of energy.

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

Award [1] for stating the correct terminology to describe the characteristics of Type II muscle fibres.

(6 × [1])

[6]

6

**6 Example answers:**

- The short-term sensory storage selects the relevant information on the incoming serve and the remainder is discarded. This is called selective attention.
- The short-term memory temporarily stores the selected information for approximately 20 seconds. The tennis player receiving the pass will look at the action of the server and path of the ball. This immediate information may be like something seen before, so the short-term memory will consult the long-term memory to search for recognition of the path of the ball.
- The long-term memory is activated to make sense of the information. Experiences that have been learned previously are compared with the new information. The more connections the long-term memory can make with the information, the more likely the tennis player will know the skill and be able to return the serve efficiently and effectively.
- The tennis player informs the short-term memory that the speed, distance travelled, direction and spin of the ball is familiar. The response generator handles the organisation of the response to provide an output. The response is transmitted to the muscles (effectors). The relevant muscles contract and the tennis player returns the serve.

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

**Level 1 ([1]–[2])**

Overall impression – basic

Basic to moderate explanation of how the short-term sensory storage, short-term memory, and long-term memory help to generate a response in returning the serve.

The quality of written communication is basic. The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation, and grammar may be such that intended meaning is not clear.

**Level 2 ([3]–[4])**

Overall impression – good

Moderate to competent explanation of how the short-term sensory storage, short-term memory, and long-term memory help to generate a response in returning the serve.

The quality of written communication is good. The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation, and grammar are sufficiently competent to make meaning clear.

**Level 3 ([5]–[6])**

Overall impression – excellent

A highly competent and detailed explanation of how the short-term sensory storage, short-term memory, and long-term memory help to generate a response in returning the serve.

The quality of written communication is excellent. The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation, and grammar are of a sufficiently high standard to make meaning clear.

[6]

6

7 *Example answers:*

Hazard	Action needed to minimise the risk
Equipment not in use lying on the fitness suite floor	Put all used equipment away.
Damaged equipment being used by students	Repair/replace/remove damaged equipment immediately.
Water spilled on the floor	Dry/clear spillages up immediately. Cone off wet area.
Poor lifting technique by students	Teach students the correct lifting technique. All students must complete an induction with the PE teacher before using the fitness equipment.
Heavy free weights available for all	Students must always be supervised. Students given guidance/training programme on suitable weights. Spotters used to support students when lifting free weights.
Falling from treadmill	Induction of students of how to use cardio equipment properly. Students kept focussed. An emergency stop button on every cardio machine.

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

Award **[1]** for explaining an action to minimise the risk stated.

(6 × [1])

[6]

6

8 (a) *Example answers:*

- Improves the function of the heart
- Improves the efficiency of the body systems
- Reduces the risk of some illnesses, e.g. diabetes
- Helps to prevent the onset of obesity
- Enables daily tasks without fatigue
- Provides a good feeling that tasks can comfortably be carried out and enjoyed

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

Award **[1]** for a competent understanding of the physical well-being benefits of regular exercise.

(2 × [1])

[2]

(b) *Example answers:*

- Reduces stress/tension
- Releases feel good hormones, e.g. serotonin
- Enables a person to control emotions

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

Award **[1]** for a competent understanding of the mental well-being benefits of regular exercise.

(2 × [1])

[2]

(c) *Example answers:*

- Basic human needs are met
- Individual has friendship/support/value in society/socially active

- Individual suffers little stress in social circumstances

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

Award **[1]** for a competent understanding of the social well-being benefits of regular exercise.

(2 × [1]) [2]

AVAILABLE  
MARKS

6

9 (a)

Person	Energy needs kcal
Average Male	2500 kcal
Active Male	3500 kcal
Average Female	2000 kcal

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

Award **[1]** for matching the correct energy need in kcal for the appropriate person.

(3 × [1]) [3]

(b) *Example answers:*

- I chose the lowest recommended kcals for the average female as their body size generally is smaller than the average male.
- I chose 2500 kcal for the average male as males are genetically bigger than females but as they are not active they will not require 3500 kcal. This could lead to weight gain.
- I chose the highest recommended kcals for the active male. As they are exercising, they will need more calories than someone with a sedentary lifestyle.

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

Award **[1]** for a basic understanding of the factors which affect a person's energy needs.

Award **[2]** for a competent understanding of the factors which affect a person's energy needs.

Award **[3]** for a highly competent understanding of the factors which affect a person's energy needs. [3]

6

10 *Example answers:*

- Improves attentiveness, concentration, learning and memory
- Better coordination
- Better reaction times
- Better decision-making
- Boosts mental well-being
- Boosts immune system
- Helps growth and repair

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

Award **[1]** for a correct benefit of quality sleep.

(2 × [1]) [2]

2

11 *Example answers:*

- Leads to addiction
- Brain damage
- Hormonal imbalance
- Sleep disruption
- Liver damage
- Heart damage
- Pancreas damage
- Immune system damage
- Increased risk of cancer

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

Award **[1]** for a correct negative consequence of **frequent alcohol abuse**.

(2 × [1])

[2]

2

12 *Example answers:*

- Detoxification
- Abstinence
- Counselling
- Alcohol anonymous
- Rehabilitation
- Self-help groups/books
- Hypnosis

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

Award **[1]** for a correct method of help to assist people who want to stop drinking alcohol.

(2 × [1])

[2]

2

13 (a) *Example answers:*

- The student is eating too many kilocalories; the student is overeating.
- The student eats a lot of food high in fat.
- The student does not include any fruit in their diet.
- The student does not include any vegetables in their diet.
- The student drinks less water than the daily recommended allowance.
- The student eats too many sugary snacks.

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

Award **[1]** for identifying a negative diet habit.

(3 × [1])

[3]

AVAILABLE  
MARKS

**(b) Example answers:**

- Consistently eating too many kilocalories/overeating/high in fat/for your energy needs leads to becoming overweight, then obese. People who are obese have an increased risk of having serious diseases and health conditions, for example, high blood pressure, type 2 diabetes, coronary heart disease, stroke, bowel cancer, low quality of life, mental illness such as depression, anxiety and other mental disorders, body pain and difficulty with other physical functioning.
- A consistent lack of vitamins and minerals will cause certain body deficiencies, for example, vitamin A deficiency may lead to dry eyes or night blindness. Vitamin C may lead to scurvy. Iron deficiency for example, may develop anaemia. A deficiency of calcium may lead to osteoporosis. With a mineral excess of sodium hypertension will be the result.
- Drinking less water than what is recommended can lead to dehydration. If dehydration occurs frequently this in turn increases the chance of suffering from arthritis and other inflammatory conditions, loss of muscle mass, urinary tract infections and increased risk of kidney stones. The shortage of liquid in brain tissue increases levels of cortisol, elevates stress, and can result in depression.

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

**Level 1 ([1]–[2])**

Overall impression – basic

Basic to moderate explanation of the consequences of the unbalanced diet to the student's physical and mental health.

The quality of written communication is basic. The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation, and grammar may be such that intended meaning is not clear.

**Level 2 ([3]–[4])**

Overall impression – good

Moderate to competent explanation of the consequences of the unbalanced diet to the student's physical and mental health.

The quality of written communication is good. The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation, and grammar are sufficiently competent to make meaning clear.

**Level 3 ([5]–[6])**

Overall impression – excellent

A highly competent and detailed explanation of the consequences of the unbalanced diet to the student's physical and mental health.

The quality of written communication is excellent. The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation, and grammar are sufficiently of a sufficiently high standard to make meaning clear.

[6]

9

**14** *Example answers:*

- People who tend to be inward looking, shy and are comfortable in their own company. People with these personal characteristics may prefer individual sport activities with little movement, which require refined skills, and sports with repetitive actions, such as archery.
- Compared to people with high drive and motivation, possess the ability to control the movement of large muscles, have low concentration and thrive working with others. People with these personal characteristics enjoy stimulating team sports such as rugby.

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

Award **[1]** for a moderate understanding of how personality characteristics may affect a person's participation in sport.

Award **[2]** for a competent understanding of how personality characteristics may affect a person's participation in sport.

(2 × [2]) [4]

4

**15** *Example answers:*

- Intrinsic motivation is the drive that comes from within, for example, pride, satisfaction, a sense of accomplishment, self-worth.
- A sporting example of intrinsic motivation is running a 5km race for a personal best time.
- Extrinsic motivation is the drive to perform well or to win to gain external rewards. Such as, prizes, money, or praise.
- A sporting example of extrinsic motivation is a golfer taking part in a competition to win the prize money.

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

Award **[1]** for a clear and competent understanding of intrinsic motivation.

Award **[1]** for an example of intrinsic motivation being used in sport.

Award **[1]** for a clear and competent understanding of extrinsic motivation.

Award **[1]** for an example of extrinsic motivation being used in sport.

(4 × [1]) [4]

4

**16** *Example answers:*

- A school with an ethos for participation in sport immerses its students in this culture and the students are more likely to become involved in physical activity or sport.
- PE within schools can provide opportunities to try different physical activities and sports. Students discover the physical activities they enjoy or are good at, so participate.
- Schools offer extra-curricular activities, so students can experience other physical activities not offered in the curriculum. These activities can interest them and so they can participate.
- Role models in schools (teachers and other students) can encourage students to get involved or continue to participate in physical activities or sports.
- Previous sporting successes within the school can encourage students to take up specific sports.
- The interest or enthusiasm of a teacher or coach in a sport can encourage students to participate.

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

Award **[1]** for each valid example given on how student's experiences at school can positively affect their participation in physical activity or sport.

(3 × [1]) [3]

3

17 *Example answers:*

- Is the local park suitable?
- What age range?
- Suitable date free from other planned local activities.
- Equipment, staff, and resources needed.
- Agree deadlines for all event tasks.
- Delegate tasks.
- Scheduling of the event, for example the date or total number of entries.
- Agreed team meetings to check progress.
- Decide how many staff are required to run the park run.
- Responsibilities and duties of staff.
- Recruit and train staff.
- Will staff be paid or volunteers?
- Will the staff be insured?
- How will the staff be identified at the event?
- Will the staff be fed at the event?
- Calculate the cost – produce a budget outline/likely income/possible expenditure – insurance cost/staff costs/availability of funds – grants, entry fees, sponsorships, merchandise.
- Agree a budget/plan to keep a full record.
- Availability of funds for example, grants, entry fees, sponsorships, or merchandise.
- Conduct a risk assessment.
- Conduct a feasibility study.
- Advertise the event.
- Arrange hospitality.

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

Award **[1]** for an appropriate action needed to ensure a successful park run.

(8 × [1])

[8]

8

18 (a) *Example answers:*

Win	3 points
Draw	1 point

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

Award **[1]** for each correct planned score for a win or a draw.

(2 × [1])

[2]

(b) *Example answers:*

	Pitch	Match 1	Match 2	Match 3	Match 4	Match 5
<b>Group stage</b>	<b>Pitch 1</b>	4v3	3v2	2v1	1v5	5v4
<b>Group stage</b>	<b>Pitch 2</b>	5v2	4v1	3v5	2v4	1v3

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

Award **[1]** for each correct match.

(10 × [1])

[10]

**Total**

**AVAILABLE MARKS**

12

**100**