



Oxford Cambridge and RSA

GCSE (9–1)

Physical Education

J587/01: Physical factors affecting performance

General Certificate of Secondary Education

Mark Scheme for Autumn 2021

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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1. Annotations used in the detailed Mark Scheme

Annotation	Description	Annotation	Description
	Tick	KU	Knowledge and understanding / indicates AO1 on extended response Q (*)
	Cross	EG	Example/Reference / indicates AO2 on extended response Q (*)
BOD	Benefit of doubt	DEV	Development / indicates AO3 on extended response Q (*)
TV	Too vague	L1	Level 1 response on extended response Q (*)
REP	Repeat	L2	Level 2 response on extended response Q (*)
IRRL	Significant amount of material which doesn't answer the question	L3	Level 3 response on extended response Q (*)
SEEN	Noted but no credit given / indicates sub-max reached where relevant	S	Sub-max reached
BP	Blank page		

- **KU, EG and DEV** used instead of ticks on the extended response question to indicate where knowledge or development points from the indicative content have been made.
- On the extended response question (*), one KU, EG or DEV does not necessarily equate to one mark being awarded; the marking is based on a levels of response mark scheme which awards a level and mark holistically based upon the quality of the response overall against the levels descriptors.

Section A				
Question		Answer	Marks	Guidance
1		One mark for: Number of (heart) beats <u>per minute</u>	1 1 x (AO1)	Do not accept: 'Number of heart beats' on its own = TV
2	(a)	One mark for: Transverse	1 1 x (AO3)	
2	(b)	One mark for: True	1 1 x (AO3)	
3		One mark for: Allows passage of air to the lungs OR connects the mouth / nose / larynx to the lungs / bronchi	1 1 x (AO1)	Do not accept: Windpipe on its own = TV If oxygen stated instead of air - BOD
4	(a)	One mark for: The time taken to respond to a stimulus	1 1 x (AO1)	Do not accept: Definitions using the word 'react/reaction, e.g. Time taken to react to a stimulus = TV
	(b)	One mark for: Ruler (test)	1 1 x (AO1)	Accept: Batak board and other <u>named</u> online tests
4	(c)	One mark for: A sprinter that responds to the gun quicker will have more chance of winning the race / get a better start OR the footballer that moves to the ball faster will have more chance of getting there first / beating the defender / scoring a goal	1 1 x (AO2)	Answer must show a benefit for performance

Section A				
Question		Answer	Marks	Guidance
5		One mark for: Frontal	1 1 x (AO3)	
6		One mark for: (C) The amount of blood leaving the heart in one beat	1 1 x (AO1)	
7	(a)	One mark for: Tibia / fibula	1 1 x (AO2)	Accept: phonetic spellings of tibia and fibula Do not accept: fibia / tibula
7	(b)	One mark for: (Reversibility means that) fitness gains will decrease OR adaptations will be lost OR skill levels decrease (because they are unable to train as much)	1 1 x (AO2)	
8		Two marks for two of: 1. Legs need to be straight / knees flat on floor 2. No footwear / bare feet 3. Reach as far forward as possible 4. Move slowly / no bouncing 5. Maintain position for two seconds	2 2 x (AO1)	

Section A				
Question		Answer	Marks	Guidance
9	(a)	Two marks for: 1. (Aerobic) – Playing a full / whole game of netball OR hockey player continuously running up and down the pitch 2. (Anaerobic) – Jumping up to head the ball in football OR a rugby player sprinting to score a try	2 2 x (AO2)	Team sport must be named. Do not accept: Playing a game of football / basketball = TV Do not accept: Any reference to individual sports such as 100 m sprint for anaerobic (Question asks for team sports) Accept examples of low intensity exercise, e.g. jogging across pitch as BOD
	(b)	One mark for: Fartlek	1 1 x (AO1)	
10		One mark for: True	1 1 x (AO2)	
11		One mark for: To enable more blood / oxygen to be delivered to the (working) muscle	1 1 x (AO2)	Do not accept: Raises pulse / heart rate = TV
12		Two marks for: 1. (load) arrow vertical and pointing down 2. (effort) arrow vertical and pointing up	2 2 x (AO3)	Do not accept: arrows if not correctly labelled load or effort. Arrows must be vertical

Section A				
Question		Answer	Marks	Guidance
13		One mark for: Stabilises joint / body part / limb OR assists agonist to work effectively OR prevents unintended movements	1 1 x (AO1)	
14		One mark for Strength	1 1 x (AO1)	
15		One mark for: (B) Humerus, radius, ulna	1 1 x (AO1)	
16		Two marks for two of: 1. 2 people (minimum) 2. Bend / flex knees (to lift) 3. Keep back straight 4. Communication between lifters / work together	2 2 x (AO2)	Look for some indication that the knees have been bent for MP 2, e.g. squat
17		One mark for: Skeleton provides surface for muscles / tendons to attach OR lever systems / bones act as levers OR skeleton is jointed / has joints	1 1 x (AO2)	
18		One mark for: <u>Aorta</u>	1 1 x (AO1)	Artery = TV

Section A				
Question		Answer	Marks	Guidance
19	(a)	<p>One mark for:</p> <p>Ability to take in and use oxygen / ability of (heart and lungs) to get oxygen to the muscles</p> <p>OR the ability to continuously exercise without tiring</p>	<p>1</p> <p>1 x (AO1)</p>	<p>Accept: cardiovascular endurance / stamina</p> <p>How long you can last doing continuous exercise = TV</p>
	(b)	<p>One mark for:</p> <p>They can pedal for longer without getting tired / fatigued or cycle at a higher intensity for longer</p>	<p>1</p> <p>1 x (AO2)</p>	<p>Answer must be applied to cycling.</p>
20		<p>One mark for:</p> <p>Spinal cord</p>	<p>1</p> <p>1 x (AO1)</p>	<p>Accept: Central nervous system or CNS = BOD</p>

Section B				
Question		Answer	Marks	Guidance
21	(a)	<p>Six marks for:</p> <p>(Ligaments)</p> <ol style="list-style-type: none"> 1. Connect bone to bone / help stabilise the joint / prevent dislocation / act as shock absorber 2. Help maintain correct technique when jumping for a basketball rebound / helps prevent injury when landing after a jump shot <p>(Tendons)</p> <ol style="list-style-type: none"> 3. Connect bone to muscle 4. When the muscle contracts this pulls on the bone creating movement to pass the netball / run / move into space on the netball court <p>(Cartilage)</p> <ol style="list-style-type: none"> 5. Provides protection to bones / shock absorber / prevents bones rubbing together 6. Cushions the joint after landing to block a basketball shot 	<p>6</p> <p>3 x (AO1)</p> <p>3 x (AO2)</p>	<p>Accept: Examples within descriptions for sub-max two marks. For example, cartilage protects the bones (Point 5) of a basketball player when running up and down the court (Point 6) = 2 marks sub-max</p> <p>NB: MP 2, 4 and 6 must be applied to basketball or netball to gain credit.</p>
	(b)	<p>Four marks for four of:</p> <ol style="list-style-type: none"> 1. Vascular shunt (mechanism) 2. Vasodilation of blood vessels to muscles (all muscles in body need more blood so no need for 'working muscles') 3. More blood / oxygen to muscles 4. Vasoconstriction of blood vessels to other / non-essential organs / liver / kidneys / gut 5. Less blood to organs 6. During time-outs / stoppages / substitution / half time 7. Less blood to muscles / more blood to organs 	<p>4</p> <p>4 x (AO3)</p>	<p>MP 7 is directly linked to MP 6 and cannot be credited without MP 6</p>

Section B					
Question			Answer	Marks	Guidance
22	(a)	(i)	One mark for: (Warm up) Increased / raised respiratory rate (by 3 breaths) (for every player)	1 1 x (AO3)	'Breathe more' on its own = TV
		(ii)	One mark for: Midfielder	1 1 x (AO3)	
		(iii)	One mark for: Half-time so players had less demand for oxygen	1 1 x (AO3)	'Players were inactive / resting at half time' = TV (this is a description. not an explanation)
		(iv)	One mark for: Injured OR defensive role OR lack of motivation OR change of tactics	1 1 x (AO3)	Accept other suitable answers
	(b)		Four marks for four of: 1. Increased efficiency to take in O ₂ / to supply O ₂ to muscles OR more efficient gaseous exchange / diffusion 2. Increased surface area of alveoli 3. Increased capillarisation / capillary density around alveoli 4. Stronger respiratory muscles / respiratory muscle hypertrophy 5. Increase in (maximum) pulmonary ventilation / vital capacity 6. Increase in minute volume / minute ventilation 7. Increase in tidal volume 8. Reduced resting respiratory rate 9. Decrease in lung disease / healthier lungs	4 4 x (AO1)	Do not accept: 'Stronger muscles' on its own. Respiratory / breathing muscles must be stated or named. 'Increased lung capacity' = BOD 5 'Reduced respiratory rate' = TV

	(c)	Two marks for two of: 1. (Lactic acid) causes fatigue / tiredness 2. Pain / soreness in the muscles 3. Decrease in performance	2 2 x (AO1)	Do not accept: cramp 'Have to take a break' = TV														
23	(a)	Four marks for four of: <table border="1" data-bbox="421 513 1422 1198"> <thead> <tr> <th>(method)</th> <th>(practical example)</th> </tr> </thead> <tbody> <tr> <td>1. Wear protective equipment</td> <td>2. Gumshield / scrum cap</td> </tr> <tr> <td>3. Correct clothing / footwear</td> <td>4. Compression wear / studded boots</td> </tr> <tr> <td>5. Appropriate level of competition</td> <td>6. Ensure rugby players are of same gender / age / experience</td> </tr> <tr> <td>7. Teach correct techniques</td> <td>8. Teach how to tackle properly / safely</td> </tr> <tr> <td>9. Encourage fair play OR do not promote gamesmanship / violence / aggression</td> <td>10. No high / spear tackles OR substitute players showing aggression</td> </tr> <tr> <td>11. Cool down</td> <td>12. Low-intensity exercises OR stretching</td> </tr> </tbody> </table>	(method)	(practical example)	1. Wear protective equipment	2. Gumshield / scrum cap	3. Correct clothing / footwear	4. Compression wear / studded boots	5. Appropriate level of competition	6. Ensure rugby players are of same gender / age / experience	7. Teach correct techniques	8. Teach how to tackle properly / safely	9. Encourage fair play OR do not promote gamesmanship / violence / aggression	10. No high / spear tackles OR substitute players showing aggression	11. Cool down	12. Low-intensity exercises OR stretching	4 2 x (AO1) 2 x (AO2)	Practical example must match method. Accept: Brand names of correct clothing 'Correct equipment' = BOD 1 or 3 depending on example
(method)	(practical example)																	
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<p>Level 3 (5–6 marks)</p> <ul style="list-style-type: none"> • detailed knowledge & understanding • clear and consistent practical application of knowledge & understanding • effective analysis/evaluation and/or discussion/explanation/development • relevant information drawn upon from other areas of the specification • accurate use of technical and specialist vocabulary • there is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. <p>Level 2 (3–4 marks)</p> <ul style="list-style-type: none"> • satisfactory knowledge & understanding • some success in practical application of knowledge & understanding • analysis/ evaluation and/or discussion/explanation/development attempted with some success • some relevant information drawn upon from other areas of the specification • technical and specialist vocabulary used with some accuracy • there is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. <p>Level 1 (1–2 marks)</p> <ul style="list-style-type: none"> • basic knowledge & understanding • little or no attempt at practical application of knowledge & understanding • little or no attempt to analyse/ evaluate and/or discuss/explain/develop • little or no relevant information drawn upon from other areas of the specification • technical and specialist vocabulary used with limited success • the information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear. <p>(0 marks)</p> <ul style="list-style-type: none"> • no response or no response worthy of credit. 	<p>Level 3 Discriminators</p> <ul style="list-style-type: none"> • detailed knowledge & understanding of the benefits of mental preparation techniques and many physical benefits of a cool down • explanations of the benefits of mental preparation techniques and the benefits of a cool down are detailed and supported with relevant examples • AO1, AO2 and AO3 are well covered for Level 3; some imbalance may be present for 5 marks. At 6 marks, all AOs are equally well addressed <p>Level 2 Discriminators</p> <ul style="list-style-type: none"> • satisfactory knowledge & understanding of the benefits of mental preparation techniques and some physical benefits of a cool down • explanations of the benefits of mental preparation techniques and the benefits of a cool down are satisfactory and supported with some relevant examples • evidence of satisfactory coverage of both parts of the question or one part is answered well and the other part shows basic understanding of that topic <p>Level 1 Discriminators</p> <ul style="list-style-type: none"> • basic knowledge & understanding of the benefits of mental preparation techniques and physical benefits of a cool down • limited explanation of the benefits of mental preparation techniques • limited explanation of the physical benefits of a cool down • Responses may be limited to AO1 knowledge and understanding
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<p>Q23 (b)* Indicative content</p> <p>6 marks - 2 x AO1, 2 x AO2, 2 x AO3 AO1 = numbered points & AO2 = bullet points (unless AO3 stated)</p> <p><u>Mental Preparation Techniques</u></p> <ol style="list-style-type: none"> 1. Imagery (AO1) <ul style="list-style-type: none"> • heightens or controls arousal levels (<u>AO3</u>) e.g. The player using imagery to keep calm / get in the zone before the game (AO2) 2. Mental rehearsal (AO1) <ul style="list-style-type: none"> • allows effective / clear / safe decision making (<u>AO3</u>) e.g. The player visualises making tackles (AO2) • Both imagery/mental rehearsal can speed up reactions (<u>AO3</u>) 3. Selective attention (AO1) <ul style="list-style-type: none"> • improves concentration / focus (<u>AO3</u>) e.g. The player uses selective attention to concentrate on the upcoming game e.g. The player focuses on the ball during a tackle and ignores the crowd (AO2) 4. Positive thinking (AO1) <ul style="list-style-type: none"> • increases motivation / confidence / self-awareness (<u>AO3</u>) e.g. The player believes they are going to win / play well OR telling themselves they are going to make a good tackle or win the ball in the scrum / lineout (AO2) 	<p><u>Physical benefits of a cool down</u></p> <ol style="list-style-type: none"> 5. Helping the body's transition back to a resting state (AO1) 6. Gradually lowers heart rate (AO1) <ul style="list-style-type: none"> • returns pulse back to resting state (AO1) 7. Gradually lowers temperature (AO1) <ul style="list-style-type: none"> • slowly returns body temperature back to normal (AO1) 8. Circulates blood and oxygen (AO1) <ul style="list-style-type: none"> • reduces the risk of blood pooling (<u>AO3</u>) • maintains blood / oxygen flow to muscles that have been working (<u>AO3</u>) 9. Gradually reduces breathing rate (AO1) <ul style="list-style-type: none"> • number of breaths taken is slowly reduced (AO1) • helps reduce feelings of nausea / dizziness (<u>AO3</u>) 10. Increases removal of (other) waste products (AO1) 11. Reduces the risk of muscle soreness and stiffness (AO3) <ul style="list-style-type: none"> • less likely to feel aches and pains (<u>AO3</u>) • delayed onset of muscle soreness (<u>AO3</u>) 12. Aids recovery by stretching muscles (AO1) <ul style="list-style-type: none"> • maintenance stretches to return muscle to normal length (<u>AO3</u>) • lengthening and strengthening muscles for next work-out (<u>AO3</u>) • reduces risk of damage to joints (<u>AO3</u>)
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