

## **GCSE (9–1)**

### **Physical Education**

**J587/01:** Physical factors affecting performance

General Certificate of Secondary Education

**Mark Scheme for November 2020**

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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.

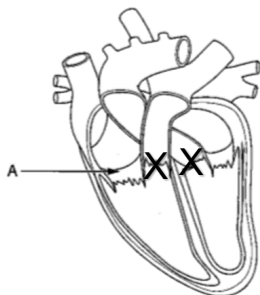
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## Annotations

Annotation	Description	Annotation	Description
	Tick	<b>KU</b>	Knowledge and understanding / indicates AO1 on extended response Q (*)
	Cross	<b>EG</b>	Example/Reference / indicates AO2 on extended response Q (*)
<b>BOD</b>	Benefit of doubt	<b>DEV</b>	Development / indicates AO3 on extended response Q (*)
<b>TV</b>	Too vague	<b>L1</b>	Level 1 response on extended response Q (*)
<b>REP</b>	Repeat	<b>L2</b>	Level 2 response on extended response Q (*)
<b>IRRL</b>	Significant amount of material which doesn't answer the question	<b>L3</b>	Level 3 response on extended response Q (*)
<b>SEEN</b>	Noted but no credit given / indicates sub-max reached where relevant	<b>S</b>	Sub-max reached
<b>BP</b>	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	(a)		One mark for:  Agonist = Quadriceps	1  1 x AO2	<b>Mark 1<sup>st</sup> answer only</b>  Accept phonetically correct spellings
	(b)		One mark for:  Antagonist = Hamstrings	1  1 x AO2	<b>Mark 1<sup>st</sup> answer only</b>
2	(a)		One mark for:  (Shoulder/arm) rotations / circles / windmills / circumductions	1  1 x AO2	Accept other correct examples that may increase ROM at the shoulder.  Arm swings / crossovers = BOD
	(b)		One mark for:  (Hip) open/close the gate <b>OR</b> groin walk <b>OR</b> rotations <b>OR</b> lunges	1  1 x AO2	<b>Do not accept:</b> same wording as for (a), e.g. hip rotations (if shoulder rotations in (a) = REP  High knees = TV
	(c)		One mark for:  Skill rehearsal	1  1 x AO1	Skills practice / skill-based activities / activity-specific movements / sport-specific activities / movement practice = BODs (named on respectable websites)
3			One mark for:  False	1  1 x AO1	
4			One mark for:  (C) Tibia and fibula	1  1 x AO1	

Section A					
Question			Answer	Marks	Guidance
5			One mark for:  Keeps oxygenated blood separate from deoxygenated blood  <b>OR</b> prevents blood in left side of heart moving directly to right (or opposite)	<b>1</b>  1 x AO2	<b>Do not accept:</b> Any answers that don't relate to <b>blood flow</b> , e.g. 'the septum is a muscular wall that separates the left and right sides of the heart' = TV  Maintains correct pathway = BOD
6			One mark for:  Sternum	<b>1</b>  1 x AO2	
7			One mark for:  (Intercostal muscles) contract <b>and</b> pull ribs / lungs up or out  <b>OR</b> contract <b>and</b> increase the volume of the lungs / thoracic cavity	<b>1</b>  1 x AO1	DNA: contract on its own (TV)  Allow rib cage to expand = TV  Create more room for lungs = TV
8	(a)		One mark for:  	<b>1</b>  1 x AO1	Accept: Either semilunar valve correctly marked.  If more than one X: Both valves marked correctly = BOD if one is correct but one is wrong = TV  If X is just above the valve = BOD  If no response stamp <b>SEEN</b> and <b>NR</b> in mark column
8	(b)		One mark for:  Ventricles / left ventricle / right ventricle	<b>1</b>  1 x AO1	

Section A					
Question			Answer	Marks	Guidance
9			One mark for:  D	1  1 x AO3	
10			Two marks for:  A = Trachea  B = Alveoli	2  2 x AO1	
11			One mark for:  Sagittal	1  1 x AO2	
12	(a)		One mark for:  (Example) Shin pads / gumshield / helmet / headguard	1  1 x AO2	Mark 1 <sup>st</sup> answer only  Accept other correct examples
	(b)		One mark for:  Protects from impact / trauma / contact <b>OR</b> reduces risk of concussion <b>OR</b> protects the head / leg / shin from getting hit / kicked (or equivalent)	1  1 x AO2	
13	(a)		One mark for:  B	1  1 x AO1	Mark 1 <sup>st</sup> answer only
13	(b)		One mark for one of:  1. Prevents friction between the bones <b>OR</b> stops bones rubbing together 2. Acts a shock absorber / absorbs impact / cushions the joint 3. Provides protection / support / (some) flexibility / connection to (some) bones / (some) mobility of the joint	1  1 x AO2	If no reference to long jump - BOD

Section A					
Question			Answer	Marks	Guidance
14	(a)		One mark for:  Ella	1  1 x AO3	
	(b)		One mark for:  Aisha	1  1 x AO3	
15			One mark for:  <b>Gradually</b> lowers heart rate <b>OR</b> maintains circulation of blood / oxygen after exercise <b>OR</b> reduces risk of blood pooling	1  1 x AO1	<b>Do not accept:</b> Responses linked to <b><u>other body systems</u></b> , e.g. gradually lowers breathing rate or removes lactic acid or increases speed of recovery. Use <b>SEEN</b>  Lowers heart rate on its own = TV
16			One mark for:  <u>High intensity interval training</u>	1  1 x AO1	High intensity training = TV

17	(a)	One mark for:  Longitudinal	1  1 x AO1	
	(b)	One mark for:  Full twist in trampolining / gymnastics <b>OR</b> spinning kick in martial arts <b>OR</b> pirouette <b>OR</b> spin in ice skating / dance	1  1 x AO3	Accept other equivalents  Bowling in cricket = TV
18	(a)	One mark for:  <b>Muscular</b> endurance	1  1 x AO1	<b>Do not accept:</b>  Endurance or strength = TV  Strength endurance = BOD
	(b)	One mark for:  In gymnastics so you <b>do not fall over/off</b> when performing your routine  <b>OR</b> in a game of football the player <b>stays on their feet</b> when tackled	1  1 x AO2	Accept other equivalents  <b>Do not accept:</b> Responses linked to just the sport/activity, e.g. gymnastics beam (on its own) = TV  Response must describe the example so reference to not falling over/staying on feet is required
19		One mark for:  False	1  1 x AO2	
20		One mark for:  Volume / amount of blood pumped from the (left) ventricle(s) / heart in one minute  <b>OR</b> stroke volume x heart rate	1  1 x AO1	



21	(a)	<p>Four marks for four of: <b>(Mark 1<sup>st</sup> four answers only)</b></p> <ol style="list-style-type: none"> <li>1. Open doors / door handles / windows / blocked fire exit</li> <li>2. Wall surface / fittings</li> <li>3. Floor is slippery / wet</li> <li>4. Floor is hard / damaged / uneven / dirty</li> <li>5. litter / bags / clothing <b>in the way / causing an obstruction</b></li> <li>6. Other people / behaviour of participants</li> <li>7. overcrowding</li> <li>8. Poor technique / ability / coaching /</li> <li>9. Poor / unsuitable lighting</li> <li>10. Inappropriate clothing / footwear</li> <li>11. lack of supervision</li> </ol>	<p><b>4</b></p> <p>4 x AO1</p>	<p><b>Do not accept:</b> Answers that refer to <b><u>equipment</u></b> (in question) use <b>REP</b></p> <p>Litter/bags/clothing on its own is TV. Items must be <b>in the way, causing an obstruction</b> or causing a hazard in some other way.</p> <p>Poor hygiene = TV</p>
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**Level 3 (5–6 marks)**

- 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.

**Level 2 (3–4 marks)**

- 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.

**Level 1 (1–2 marks)**

- 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.

**(0 marks)**

- no response or no response worthy of credit.

**Level 3 Discriminators**

- detailed knowledge & understanding of the importance of strength with reference to both team and individual sports
- detailed description of **one** recognised strength test
- at least **three** different types of feedback are described and how they can improve performance
- clear and consistent practical application of knowledge & understanding in both team and individual sports
- AO1, AO2 and AO3 are well covered for Level 3; some imbalance between parts of the question may be present for 5 marks. At 6 marks, all three areas of the question are addressed well

**Level 2 Discriminators**

- satisfactory knowledge & understanding of the importance of strength with reference to either team or individual sports
- satisfactory description of **one** recognised strength test
- one or more types of feedback are described with some understanding of how they can improve performance
- Some success at developed AO2 and/or AO3 points moves the response into Level 2

**Level 1 Discriminators**

- basic knowledge & understanding of the importance of strength in sport
- limited description of **one** recognised strength test
- few types of feedback are described or there is little understanding of how feedback can improve performance (identification rather than description)
- little or no attempt at practical application of knowledge & understanding in team or individual sports
- Responses only demonstrating AO1 knowledge and understanding are Level 1

**Q21(b)\* Indicative content (6 marks - 2 x AO1, 2 x AO2, 2 x AO3)****AO1 = numbered points; AO2 = examples; AO3 stated**

1. (Definition of strength) amount / maximum of force muscles can produce to overcome resistance **OR** the ability of the muscles to exert force

2. There are different types of strength **OR** named types (static / dynamic / explosive / endurance)

- (e.g.) A gymnast holding the crucifix position (static)
- (e.g.) A rower in a race (dynamic)

3. Links with power **OR** combination of strength and speed

- (e.g.) using power to sprint out of the blocks in 100m
- (e.g.) being able to drive a golf ball a long distance

1. (benefits of strength in team sports)

- (e.g.) Football – the ability to overcome challenges/shield the ball/tackle
- (e.g.) Cricket – throw/hit the ball further

2. (benefits of strength in individual sports)

- (e.g.) Weightlifting – being able to lift a heavier weight than your opponents
- (e.g.) Rock climbing – being able to support/lift body weight in holds

6. The more strength a performer has the better / more efficient their performance (or opposite) **(AO3)**

7. If performer lacks strength they must compensate with higher skill levels **(AO3)**

8. (factors affecting strength) **(all AO3):**

- The amount force that is generated depends on the size of the muscle
- Muscle hypertrophy is an increase in size of muscle which means more strength can be generated
- Slow twitch fibres can produce energy over a long period of time / aerobic
- Fast twitch fibres produce greater strength / anaerobic

(Tests of strength):

9. Hand grip test

- Dynamometer
- Squeeze as hard as possible
- Three attempts, record the highest reading in kilograms (kg)
- Use normative data table to indicate excellent/average/poor ratings

10. 1 Repetition Maximum (1RM) (accept other numbers, e.g. 6RM)

- Select appropriate exercise, e.g. squats for lower body strength or bench press for upper body strength
- Select realistic weight
- Continue to increase the weight until weight can no longer be lifted
- The last weight you can lift is your 1RM
- Use normative data table to indicate excellent/average/poor ratings

(Feedback):

11. Intrinsic – from within

- kinaesthesia **OR** proprioception
- (e.g.) Performer feels they are lifting the weight well

12. Extrinsic – from external sources

- Sound **OR** sight
- (e.g.) Coach encouraging you to squeeze the grip dynamometer harder

13. Positive – praise/reward that reinforces or gives information

- (e.g.) Coach shouting well done after each attempt of the strength test

14. Negative – information about an unsuccessful/poor attempt

- (e.g.) Other performers telling you that your technique was incorrect during the test

15. Knowledge of Performance – information about the movement/attempt rather than the outcome

- (e.g.) Coach telling you your technique in the 1RM bench press can be improved

16. Knowledge of Results – end result/outcome **OR** terminal feedback

- Use of tests result/score to compare to normative data to give a reading

22	(a)	(i)	One mark for: Muscle	1 1 x AO3	
	(a)	(ii)	One mark for: Liver	1 1 x AO3	
	(b)		Three marks for three of: 1. Vascular shunt mechanism 2. Muscles supplied with more <u>oxygen</u> OR less <u>oxygen</u> to body parts with a lower demand 3. (Vaso) <b>dilation</b> of blood vessels <b>so that</b> they can keep working for longer (or equivalent) 4. (Vaso) <b>constriction</b> of blood vessels <b>so that</b> blood flow to working muscles is maximised 5. Heart gets same percentage of blood but an increase in amount of blood flow 6. Skin gets less as a percentage but an increase in amount of blood flow 7. Vital organs still get enough blood to function effectively	3 3 x AO3	<b>Do not accept:</b> answers that repeat what is in the table, e.g. working muscles get more blood or kidneys get least blood = TV  Explanation of the effects of redistribution of blood is required.
	(c)	(i)	Two marks for two of: 1. Transport oxygen to the working muscles 2. Transport carbon dioxide to the lungs 3. Allow efficient gaseous exchange at the muscles / lungs / alveoli	2 2 x AO1	Blood is oxygenated at the lungs = TV
	(c)	(ii)	Three marks for three of: <b>(Mark 1<sup>st</sup> three answers only)</b> 1. Movement / attachment for muscles / forms lever systems 2. Support <b>OR</b> shape 3. Posture 4. Protection 5. Mineral storage	2 3 x AO2	<b>Do not accept:</b> production of red blood cells (in question)  Structure / framework = BOD MS 2

23	(a)	(i)	<p>Four marks for:</p> <ol style="list-style-type: none"> <li>(1<sup>st</sup> class lever) Fulcrum is in between effort and load/ EFL / LFE / fulcrum in the middle</li> <li>(2<sup>nd</sup> class lever) Load is in between fulcrum and effort/ FLE / ELF / load is in the middle</li> <li>(1<sup>st</sup> class lever) E.g. <b>neck</b> when heading a ball in football</li> <li>(2<sup>nd</sup> class lever) E.g. <b>ankle/foot</b> when jumping in basketball</li> </ol>	<p><b>4</b></p> <p>2 x AO2</p> <p>2 x AO3</p>	<p>2<sup>nd</sup> class fulcrum at end = TV</p> <p>Examples must link correct joint with a suitable sporting movement for pt. 3 and 4</p>
	(a)	(ii)	<p>2 marks for two of:</p> <ol style="list-style-type: none"> <li>The ability to move large loads with a small amount of effort.</li> <li>The effort arm for the lever must be longer than the load arm</li> <li>All 2<sup>nd</sup> class lever systems have mechanical advantage</li> <li>1<sup>st</sup> class levers can have mechanical advantage if the fulcrum is nearer the load than the effort</li> <li>3<sup>rd</sup> class levers do not have mechanical advantage</li> </ol>	<p><b>2</b></p> <p>2 x AO3</p>	<p>Only 2<sup>nd</sup> class have mechanical advantage = BOD</p>
	(b)	(i)	<p>One mark for:</p> <p>(Tidal volume) the volume / amount of <u>air</u> inhaled/exhaled <b>per breath / in one breath</b></p>	<p><b>1</b></p> <p>1 x AO1</p>	<p>Amount of air in and out per breath = BOD</p> <p>Oxygen = X</p>
	(b)	(ii)	<p>One mark for:</p> <p>(Minute ventilation) the volume / amount of <u>air</u> inhaled/exhaled in <b>per minute / in one minute</b></p>	<p><b>1</b></p> <p>1 x AO1</p>	<p>Oxygen = X</p>
	(c)		<p>Two marks for:</p> <ol style="list-style-type: none"> <li>Tidal volume increases during exercise (short term and long term)</li> <li>Minute ventilation <b>increases during</b> exercise (short term)</li> <li><b>Maximum</b> minute ventilation is greater (long term) <b>OR resting</b> minute ventilation remains same / slightly lower (long term)</li> </ol>	<p><b>2</b></p> <p>2 x AO2</p>	<p>Tidal volume increases = ✓</p> <p>But effect of exercise on minute ventilation must be qualified or implied in the answer.</p>

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