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Class

GCSE Physical Education Edexcel – Mark scheme

Reference: 5PE01/01

Time: 1 hour 30 minutes

Marks Available: 80

Instructions

- Use **black** ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided there may be more space than you need.

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets use this as a guide as to how much time to spend on each question.
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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Section A

Answer	Mark
	1
Help the individual feel good	
Answer	Mark
	1
Answer	Mark
	1
Answer	Mark
В	1
Circuit	
Answer	Mark
D	1
2 hours	
Answer	Mark
Α	1
Narrow shoulders and narrow hips	
Answer	Mark
D	1
Carries cholesterol away from the blood vessels	
Answer	Mark
В	1
Smoking damages the alveoli and lowers the efficiency of gaseous exchange	
Answer	Mark
С	1
	Mark
Α	1
Calcium	
	B Help the individual feel good Answer C Age, disability, gender and race Answer D Speed Answer B Circuit Answer D 2 hours Answer Answer D 2 hours Answer D Carries cholesterol away from the blood vessels Answer B Smoking damages the alveoli and lowers the efficiency of gaseous exchange Answer C A rugby player pushing against an opponent in the scrum Answer A

	stion	Answer	Do not accept	Additional Guidance	Marks	Total
2	а	Accept any of the following1. To increase fitness2. To improve health3. To improve performance	Any reference to reasons that stimulate us to participate in physical activity	Accept specific reference to any HRF or SRF if it is justified	1x1	1
2	b	 Accept any of the following 1. To help the individual feel good 2. To relieve stress and tension 3. To increase self-esteem and confidence 4. For enjoyment 5. For a mental challenge 	Any reference to reasons that stimulate us to participate in physical activity		1x1	1
2	c(i)	Development of friendships and social mixing		Accept any other terms from c (ii)	1x1	1
2	c(ii)	 Accept any two of the following Mixing with others when participating (1) Making new friends when joining a new club (1) Meet with current friends at your club (1) Working with others to achieve a common goal (1) 	If any answer has been provided as a response to c (i) do not accept as a reason to justify the response	Accept reference to how clubs have a strong social aspect related to the sport	1x2	2
Que	stion	Answer	Do not accept	Additional Guidance	Marks	Total
3	а	 Coach/Leader Official Volunteer 			1x1	1
3	b	 develop healthier lifestyles Create opportunities for talented performers to achieve success at the highest level, Retain people in sport (1) for health/fitness OR through club links/ <i>Better</i> <i>facilities/</i> through a variety of different roles (1) Increase sporting success of country /more medals (1) by developing talent/ talented performers produce more elite performers (1) 			2x2	2

Question	Answer	Do not accept	Additional Guidance	Marks	Total
4 a 4 b	 Accept any two from the five components of health related fitness with one suitable description Cardiovascular Fitness to perform at a high intensity without tiring (1) Muscular Strength (1) Muscular Endurance (1) Flexibility (1) Body Composition (1) A linked explanation that makes reference to the following: Accept any one component of skill related fitness Agility Balance Coordination Power Reaction Time Speed The relevant importance of the skill related fitness to a boxer. A boxer needs speed to be able to punch his opponent quickly using combinations and to move away from his opponents punches 	Any skill related components of fitness The word 'Cardiovascular' without reference to fitness or endurance Only accept a health related component of fitness once Any health related components of fitness Do not accept if reason behind the selection is vague or not relevant in the context described.	Additional Guidance Only offer 1 mark per component of fitness The answer must make reference to two different components of health related fitness Award one mark if candidate provides a component of skill related fitness	1x4	3
	skill related fitness to a swimmer. A swimmer needs speed to be able to move his arms and legs quickly to move through the water quickly to win his race				
Question	Answer	Do not accept	Additional Guidance	Marks	Total
	Accept any sport of candidates choice A linked explanation that makes reference to progressive overload	Any reference to any other principle of training			10(0)
5	Progressive overload gradually increases the amount of overload to gain fitness without the risk of injury (1) Explain how each training session will gradually increase in level of intensity to bring about an adaptation (1) Additional mark should come from reference to sporting example i.e. individual gradually increases the duration of his training to improve relevant component of fitness (1)	Explanation that does not imply need for gradual increase in intensity; Explanation that relies on use of word progress/ progressively	Accept: Gradually building up training	1x3	3

Que	stion	Answer	Do not accept	Additional Guidance	Marks	Total
6	a	 Accept any one of the following: Carbohydrates provide energy (1). Carbohydrates are stored in the muscles (and/or liver as glycogen) which is quickly converted into glucose to provide energy (1). Provide energy to meet the demands of the environment (1) Fats provide energy (1) together with glycogen help muscles to work (1) Provide energy to meet the demands of the environment (1) Protein helps build muscle and repair damaged tissue (1) Protein can also provide energy when carbohydrates are used up in long distance events (1). Protein helps to build muscle and repair injuries to muscles to allow use to participate in physical activity 	Any micronutrient	Do not accept carbs in place of carbohydrates	2x1	2
6	b	Iron is important to blood because: 1. Links with haemoglobin (1) 2. Improves oxygen carrying capacity of the blood (1) 3. Helps form red blood cells (1) 4. Prevents anaemia (1)			1x1	1

Que	stion	Answer	Do not accept	Additional Guidance	Marks	Total
7	а	 Any answer from below: 1. Improve individual performance in individual sport 2. Encouraged to do so by other athletes or coaches 3. The rewards for success are high 4. The rewards for success and financial reward 5. To compete at a higher level in their chosen sport 	Do not accept improve performance alone		1x1	1
7	b (i)	Accept any sporting athlete with reference to losing weight i.e. jockey or boxer (1) Diuretics increase urine production to increase fluid loss and lose weight (1) Example: boxer trying to fit into a specific weight category or an athlete i.e. cyclist trying to mask the use of other drugs	Accept one mark if the sporting athlete is identified but not the description Accept no marks if the description does not match the chosen sport	Accept reference to side effects if explained correctly	1x2	2
7	b (ii)	Accept any sporting example that refers to returning to training quickly or competition i.e. rugby player (1) Reduce pain and discomfort (1) Allow the athlete to train/compete despite the injury (1) Prevent reversibility occurring (1)	Accept one mark if the sporting athlete is identified but not the description Accept no marks if the description does not match the chosen sport	Accept reference to side effects if explained correctly	1x2	2
Que	stion	Answer	Do not accept	Additional Guidance	Marks	Total
8	а	Accept any relevant piece of protective clothing i.e. mouth guard, head guard, footwear, shin pads, strip/uniform	Any reference to any other type of preventative measure	Any protective piece of equipment relevant	1x1	1
8	b	 Accept one mark for correct preventative measure and second mark for relevant reason 1. Warming up/cooling down (1) to prevent injury (1) 2. Checking equipment or facilities i.e. post protectors 3. Balanced competition i.e. single sex competition 4. Playing to the rules 5. Use of PAR-Q (1) to identify pre-existing health issues (1) session can then be tailored to health needs to reduce risk of overexertion (1) 4. Entering correct level of competition (1) attempting a track that is too difficult for your standard means more likely to injure yourself (1) 	Any response referring to protective clothing including footwear	Must refer directly to the Rugby (girls) in the picture It must be clear which point the risk reduction measure links to on m/s before further marks for explanation can be credited	1x6	6

Que	stion	Answer	Do not accept	Additional Guidance	Marks	Total
9	a (i)	Oxygen	Carbon dioxide		1x1	1
9	a (ii)	Increases Increases in depth		Accept words that refer to increase i.e. quickens	1x1	1
9	a (iii)	 A linked explanation that makes reference to any three of the following: 1. (Amount of) oxygen consumed/used/needed/p aying back/replaced (1) 2. During recovery/after exercise/after anaerobic work 3. Provide additional oxygen and remove carbon dioxide 4. Shortfall in the available oxygen 	Do not credit if in context of exercising/during exercise	Accept higher level responses which accurately reference role of O2 in ATP resynthesis or resaturation of myoglobin stores Pt. 4 - oxygen available to release energy to rebuild energy stores (1) Referring to the cardiovascular/respir atory systems working together	1x3	3
9	а	 Accept any two of the following Lung capacity increases Increased vital capacity Number of alveoli increases Lung efficiency (improved delivery of oxygen to the muscles) More efficient removal of carbon dioxide Increase in gaseous exchange Increased capillaries around alveoli VO2 max increased or aerobic capacity 			1x2	2

Que	stion	Answer	Do not accept	Additional Guidance	Marks	Total
10	а	 Muscles correctly identified in relation to correct joint 1. Antagonistic is when one of the muscles contracts, AND the other relaxes (1) 2. Identified the correct muscles (Biceps, triceps working at elbow), the biceps contract to flex the arm at the elbow and the tricep relaxes when performing the press up. To return to the starting press up position the bicep contracts to allow extension 	 Not - when a pair of muscles work together/work against each other not extend in relation to muscles not straighten and bend for joint action 	Max 1 mark per numbered point on m/s If response states biceps contract and the triceps relax to provide flexion at the elbow would gain	1x2	2
10	b	 Short term effect: Lactic acid production Increase muscle temperature Long term effect: Muscle hypertrophy Strength of muscular contractions Increase in muscle strength 		Accept muscle aches/cramps Accept muscles increase in size	1x2	2

Que	stion	Answer	Do not accept	Additional Guidance	Marks	Total
11	а	 Accept any of the following 1. Allows movement 2. Provides support 3. Protection for vital organs 			1x1	1
11	b	Knee	Opposite elbow or any other type of joint		1x1	1
11	с	Answer must refer to a sporting example of the knee joint: Sporting example: kicking the ball in Football (1) the knee will be in flexion in the preparation phase before extension at the knee makes contact with the ball (1)	Any sporting example that is not clear Do not accept no mark if only one type of movement is stated	Accept any sporting example that refers to flexion and extension	1x2	2

Que	stion	Answer	Do not accept	Additional Guidance	Marks	Total
12	а	Role model	Family or peers	Accept reference to 'people'	1x1	1
12	b	Participation stage (1) Link between school and club and begins to participate regularly (1)		Accept reference to specific activity to improve skills		2
12	с	Any one from 1. Checking participants are healthy enough to start physical activity 2. To establish a baseline of intensity for physical work	Establish training goals How fit they are/physical readiness Their ability	Accept reference to safe to exercise or medical conditions	1x1	1
12	d	Accept either one of the following Test: 12 minute cooper run (1) Reason: Tests cardiovascular fitness by recording the distance ran in 12 minutes OR Relevant to the sport Jake participates in Test: Harvard Step Test Reason: Measures cardiovascular fitness by measuring your recovery rate	Do not accept any other fitness text which is not a test of cardiovascular fitness.	Accept additional fitness tests which are common i.e. multi stage fitness test (MSFT) or treadmill test	1x2	2
12	e	 Accept a specific target that the candidate creates for Jake i.e. Jake would like to run 100 metres further in the 12 minute cooper run Accept any link from the following answers Knowing exactly what the goal is (1) A specific target linked towards a long term goal (1) 	Do not accept any reference to any other principle of SMART (measurable, achievable, realistic or time bound)		1x2	2
12	f	Credit placement of resting heart rate values that gives line that slopes down to the right from Week 1 to Week 4 Insert images/thumbnails of acceptable responses Answers: Week 2 = 78 Week 3 = 76 Week 4 = 74	Graphs that have only been 'plotted', i.e. no lines.		1x1	1
12	g	Accept any two of the following Resting heart rate is decreasing each week (1) Regular effect of exercise occurring (1) Heart is more efficient pumping the same blood in fewer beats		Accept any other long term effect of exercise from the cardiovascular system i.e. cardiac output or stroke volume	1x1	1

Question	Answer
13	A discussion of the application of the methods of training to improve performance that makes reference to:

Indicative content

To progress through the levels there needs to be evidence of the ability to write coherent discussion points that relate to the question. These points could take a variety of forms but should be linked and show progression of an argument/point that links application of the methods of training used to improve performance in the 400 metres

NB - Question asks how 'this' improves performance therefore developed statements must link to the methods of training

A - Identify methods of training with definition/description (example simple statements)

List of training methods (no description)/acronyms, e.g. CCCIFW (S)

- Interval training high intense periods of work followed by periods or rest (S)
- Continuous training steady training at low intensity without rest (S)
- Fartlek training Short bursts of activity over different terrain (S)
- Circuit training various exercises for a period of time/repetitions followed by rest (S)
- Weight training progressive resistance exercise to increase levels of fitness (S)
- Cross training is a mixture of training (S)

B – Identify methods of training with examples (example simple statements) then linked to improving performance (developed)

- Interval training suitable to the 400m as you exercise at a high intensity followed by rest (S). This way you can adapt your training to suit the needs of the activity (D).
- Continuous training suitable for the 400m as you can use this do improve cardiovascular fitness and muscular endurance (S). This way your cardiovascular fitness will improve and help performance (D).
- Fartlek training not specific to 400 metre runners but the type of training will improve cardiovascular fitness and muscular endurance (S). Running over different terrains will improve fitness and you could plan your training to be flexible to match needs (reference to principles of training (D)
- Circuit training improves cardiovascular fitness and muscular endurance as well as the efficiency of cardio-respiratory system (S). Training can be adapted to suit individual needs and develops our general fitness by strengthening our muscles and improve levels of fitness (D).
- Weight training not directly specific to 400 metre running but uses progressive resistance to develop muscles (S). Regular training will improve the efficiency of muscular system, improving strength, endurance and speed by increasing muscle bulk and help prevent injury (D).
- Cross training breaks up monotony of one training session (S). Reduces stress placed on the body as a
 result of completing only one training method repeatedly as it can be adapted to meet individual needs (D).

C – Effectively applied: (example developed statements where training methods and their description linked to explanation of how they could be applied, using examples)

- Interval training training can be adapted to ensure it improves cardiovascular fitness as we exercise at high intensity to ensure he trains his anaerobic capacity. An example might be that he runs as far as possible in 30 seconds and rests for 30 seconds before repeating. This will be relevant to his sport because he will train at the high end of his target zone and develop his lactic threshold (DS).
- Continuous training can be adapted to match the FITT principle to improve general fitness. Not relevant to
 improving performance specifically but can be used as part of cross training to help the athlete maintain
 general fitness and recover from exercise. However, high intensity continuous training will improve
 efficiency of cardio-respiratory systems (DS).
- Fartlek training principles are very similar to interval training but training over different terrains and up hills allow the athlete to train against a resistance which improves both the cardiovascular fitness and muscular endurance. It can be adapted to match the FITT principle and can be tailored specifically to suit your needs (DS).
- Circuit training exercise stations can be tailored to match individual needs and can exercise a range of muscle groups e.g. body weight exercises using abdominal and lower leg muscles to improve muscular endurance (DS).
- Weight training exercise stations can be tailored to match individual needs and can exercise a range of
 muscle groups e.g. resistance weight exercises using abdominal and lower leg muscles to improve
 muscular endurance and strength to improve efficiency of muscle contractions when exercising (DS).
- Cross training uses a variety of training methods to maintain interest and motivation. Allows you to rest
 certain muscle groups and prevent possible injury e.g. high intensity interval training session followed by a
 low intensity upper body weight training session the next day (DS).

Level	Mark	Descriptor
Level 0	0	No rewardable material
Level 1	1-2	 i. A number of simple statements that comment on the methods of training E.g. Interval training – high intense exercise followed by periods of rest ii. A number of simple statements that give examples to describe the methods of training. E.g. Interval training could include 30 metre sprint followed by a 30 second period of rest
		Candidates will produce brief and narrative responses, making a limited number of simple statements, probably with limited reference to the question. Little knowledge and understanding of the range of requirements. Responses produced by candidates will be mostly generalised, and may not fully address the requirement of the question. Candidates' writing communicates ideas using everyday language, but lacks clarity and
Level 2	3-4	 organisation. There will be frequent errors in candidates' spelling, grammar and punctuation. i. Developed statements, i.e. simple statements with description and example of methods of training that, if used effectively would improve performance. E.g. Interval training could be used to match the needs of the activity to improve performance at various point of the race e.g. improve sprint finish ii. Developed statements, i.e. simple statements with explanation of how training method should be applied to bring about improvement in performance. iii. Basic (but accurate) conclusion in line with previous points.
		Candidates' responses will be mostly accurate and include relevant factual material. Some knowledge and understanding of the application of the principles of training. Candidates will have addressed the requirement of the question to discuss the use of the principles of training to improve fitness with some success. Candidates' writing communicates ideas with accurate use of appropriate terminology, and the organisation of the response shows some direction and control. There will be few errors in spelling, punctuation and grammar.
Level 3	5-6	 Developed statements (using relevant examples) balanced and succinct. Conclusion provided based on points raised Candidates will offer factually accurate and sustained responses that relate well to the focus of the question and successfully addresses the discursive demands. Sound knowledge and understanding of the principles of training and their application. The discussion will be supported by accurate factual material that is relevant to the question. The majority of the specification principles of training will be fully discussed with appropriate conclusions reached. Candidates' writing communicates ideas effectively using appropriate terminology, and organises material clearly and coherently. Spelling, punctuation and grammar will be accurate throughout the response.

	14		A discussion of the application of the effects of regular exercise on the cardiovascular system that makes reference to:
Indicative content			

Indicative content

To progress through the levels there needs to be evidence of the ability to write coherent discussion points that relate to the question. These points could take a variety of forms but should be linked and show progression of an argument/point **that links application of the effects of regular exercise on the cardiovascular system** NB - Question asks how 'this' improves performance therefore developed statements must link to the methods of training

A - Identify regular effects of exercise on the cardiovascular system with definition/description (example simple statements)

List the regular effects of exercise on the cardiovascular system (no description)/acronyms (S)

- Decreased resting heart rate heart beats fewer times at rest supplying the same amount of blood
- Increased recovery rate Speed of which the heart returns to normal after exercise
- Increased stroke volume The amount of blood pumped from the heart in one beat
- Increased cardiac output (maximum cardiac output) The amount of blood pumped from the heart in one minute
- Decreased blood pressure regular exercise reduces blood pressure as exercise helps with weight loss
- · Healthier veins and arteries Vessels are more flexible and efficient
- Size and volume of heart increases Increase in the number of capillaries in the heart **and/or** the size of the ventricles increase
- Increase number of red blood cells can carry more oxygen to the working muscles.

B – Identify regular effects of exercise with examples (example simple statements) then linked to improving the cardiovascular system (developed)

- Resting heart rate heart beats fewer times at rest due to the increase in stroke volume (S). The lower our resting heart rate means the fitter we are and less stress is placed on the heart (D)
- Increased recovery rate How quickly we return to our resting heart rate (S). The faster we recover from
 exercise means we can exercise more frequently and increase cardiovascular fitness (D).
- Increased stroke volume Stroke volume increases meaning the heart is more efficient (S). The heart is
 therefore stronger and contract more powerfully to pump blood around the body (D).
- Increased cardiac output (maximum cardiac output) The amount of blood pumped around the body (S) means we can get more oxygen to the working muscles to exercise/participate in physical activity (D).
- Decreased blood pressure Regular exercise helps get rid of plaque build-up in the vessels (S) which
 constricts the arteries and increases blood pressure. Therefore the arteries are clear and can allow more
 blood to be transported through them allowing oxygen to get to the working muscles
- Healthier veins and arteries Vessels are more flexible and efficient (S) so they are clear of plaque. If there a person has a heart attack the area of damage is likely to be less critical because they are fitter (D)
- Size and volume of heart increases More efficient heart allows for the cardio-respiratory system to be more efficient (S). As a result eh cardiovascular system can transport oxygen to and carbon dioxide from the working muscles

C – **Effectively applied:** (example developed statements where effects of exercise and their description linked to explanation of how they impact on the cardiovascular system, using examples)

- Reference should be made to how the developed statements above improve performance of the cardiovascular system. An example of how the performance of a fit athlete against the performance of an unfit athlete should be made clear.
- A fit athlete will be able to work at a higher intensity as a result of regular training. Their levels of cardiovascular fitness will be greater because... (reference to the above)
- A stronger heart means that an athlete can pump more blood around the body which means more oxygen can be transported to the working muscles. Athletes can then perform at a higher intensity as they are more tolerant to lactic acid. If an athlete was racing against an opponent, the fitter the athlete would mean they can work anaerobically at the end of the race (i.e. sprint finish).

Level	Mark	Descriptor
Level 0	0	No rewardable material
Level 1	1-2	 iii. A number of simple statements that comment on the effects of exercise on the cardiovascular system E.g. regular training increases stroke volume and cardiac output. iv. A number of simple statements that give examples to describe the effects of exercise on the cardiovascular system. E.g. regular training increases stroke volume and cardiac output meaning we can pump more blood around the body.
		Candidates will produce brief and narrative responses, making a limited number of simple statements, probably with limited reference to the question. Little knowledge and understanding of the range of requirements. Responses produced by candidates will be mostly generalised, and may not fully address the requirement of the question. Candidates' writing communicates ideas using everyday language, but lacks clarity and organisation. There will be frequent errors in candidates' spelling, grammar and punctuation.
Level 2	3-4	 iv. Developed statements, i.e. simple statements with description and example of methods of training that, if used effectively would improve performance. E.g. regular training increases stroke volume and cardiac output meaning our heart can pump the same amount of blood as it previously could in fewer beats. Therefore the heart has capacity to work harder during exercise v. Developed statements, i.e. simple statements with explanation of how effect of exercise which has been applied will bring about improvement in cardiovascular system. vi. Basic (but accurate) conclusion in line with previous points.
		Candidates' responses will be mostly accurate and include relevant factual material. Some knowledge and understanding of the application of the principles of training. Candidates will have addressed the requirement of the question to discuss the use of the principles of training to improve fitness with some success. Candidates' writing communicates ideas with accurate use of appropriate terminology, and the organisation of the response shows some direction and control. There will be few errors in spelling, punctuation and grammar.
Level 3	5-6	 iii. Developed statements (using relevant examples) balanced and succinct. iv. Conclusion provided based on points raised Candidates will offer factually accurate and sustained responses that relate well to the focus of the question and successfully addresses the discursive demands. Sound knowledge and understanding of the principles of training and their application. The discussion will be supported by accurate factual material that is relevant to the question. The majority of the specification principles of training will be fully discussed with appropriate conclusions reached. Candidates' writing communicates ideas effectively using appropriate terminology, and organises material clearly and coherently. Spelling, punctuation and grammar will be accurate throughout the response.