Apex Exam Guide

Physical Education
Year 12 QCE
Queensland Curriculum

2025 Edition

Paul Cambridge

Apex Exam Guide
Physical Education
Year 12 QCE

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Contents

Unit 4 – Energy, fitness and training and physical activity

Note: All questions are from Unit 4, Topic 1. Questions have been divided into Paper 1 Section 1 and Paper 1 Section 2.

Unit 4 – Topic 1: Energy, fitness and training integrated

Paper 1 Section 1

2023 Paper 1 Section 1 Question 1	Identify the feature of a training program where exercise is reduced prior to competition to ensure no negative impacts from fatigue. (A) tapering (B) recovery (C) work volume (D) specific training objectives

2023 Paper 1 Section 1 Question 2	Which training method for physical activity has direct links to mobilising joints to maintain and improve range of motion? (A) circuit training (B) fartlek training (C) interval training (D) flexibility training

2023 Paper 1 Section 1 Question 3	The table shows the combination of energy system contributions for different lengths of running races.

Event	ATP-PC (%)	Lactic acid (%)	Aerobic (%)
100 m	53	44	3
200 m			
400 m	12	50	38
800 m	6	33	61

Identify the contributions for the 200 m event.

	ATP-PC (%)	Lactic acid (%)	Aerobic (%)
(A)	15	45	40
(B)	30	60	10
(C)	45	32	23
(D)	50	44	6

2023 Paper 1 Section 1 Question 4	When ATP is resynthesised using muscle glycogen as the fuel in the absence of oxygen, the end product is (A) adenosine diphosphate. (B) creatine phosphate. (C) glucose. (D) lactate.

2023 Paper 1 Section 1 Question 5	The table shows an athlete's fartlek training session.

Step	Time (in minutes)	Activity
1	5	Hard run — 4:45 min per km pace
2	5	Easy slow jog
3	5	Hard run — 4:35 min per km pace
4	5	Walk
5	5	Hard run — 4:45 min per km pace
6	5	Easy slow jog

Identify what is occurring in steps 2, 4 and 6.

(A) warm-up
(B) cool down
(C) active recovery
(D) passive recovery

2023 Paper 1 Section 1 Question 6

An athlete is targeting the lactic acid system.

Activity	Description
1	1500 m run / 65% MHR
2	Rest for 2 minutes
3	30 m sprint x 12 Work:rest ratio 1:10

Identify what modification would allow the athlete to better train to their target.

(A) Increase the intensity of activity 1 and decrease the rest in the ratio for activity 3.
(B) Decrease the duration of activity 1 and decrease the rest in the ratio for activity 3.
(C) Increase the intensity of activity 1 and decrease the intensity of activity 3.
(D) Remove activity 2 and increase the sprint distance for activity 3.

2023 Paper 1 Section 1 Question 7	The graph shows an athlete's oxygen consumption and blood lactate accumulation during exercise.
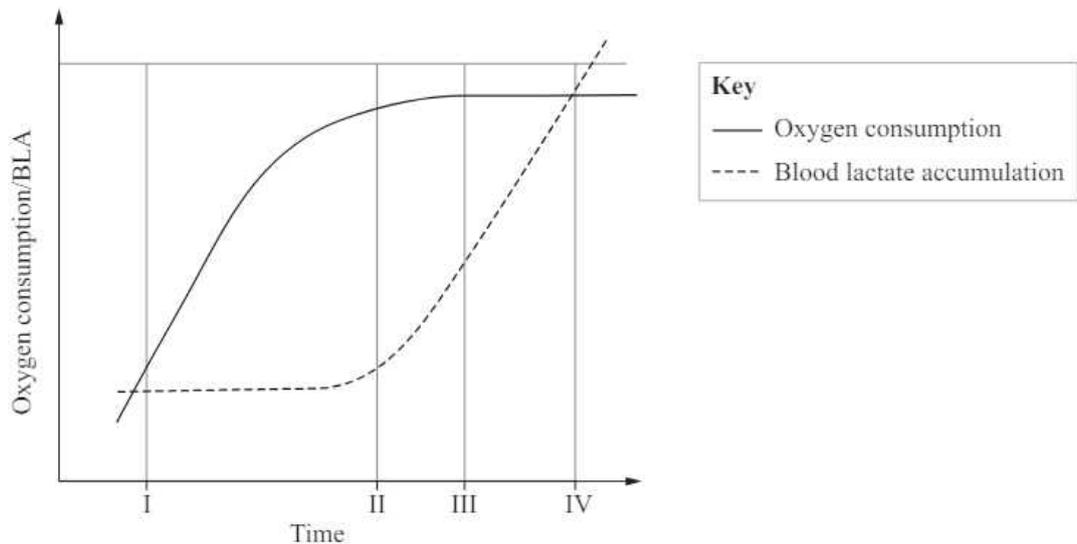
Determine where the athlete first reaches their VO2 max.

(A) I
(B) II
(C) III
(D) IV

2023 Paper 1 Section 1 Question 8	Which training principle is used when an endurance runner introduces full-body resistance training to help improve motivation and muscle imbalances? (A) progressive overload (B) individuality (C) specificity (D) variety

2023 Paper 1 Section 1 Question 9	The table shows resistance-based training methods.

	1	2	3
Sets	3–6	2–3	2–6
Repetitions	4–6	12–15	2–4
Load	60–80%	50–65%	85–95%
Rest	3 minutes between sets	30 seconds between sets	3 minutes between sets

Which training methods correspond with each number?

	1	2	3
(A)	Muscular power	Muscular endurance	Muscular strength
(B)	Muscular power	Muscular strength	Muscular endurance
(C)	Muscular strength	Muscular endurance	Muscular power
(D)	Muscular strength	Muscular power	Muscular endurance

2023 Paper 1 Section 1 Question 10	Identify the main limiting factor for continued exercise when operating above the lactate threshold. (A) glycogen depletion (B) aerobic system exhaustion (C) creatine phosphate accumulation (D) lactic acid accumulation in the working muscles

2022 Paper 1 Section 1 Question 1	An athlete measuring the amount of oxygen they can consume during gradual increases in exercise intensity is collecting data relating to (A) VO_2 max. (B) lactate threshold. (C) muscular endurance. (D) phosphocreatine resynthesis rate.

2022 Paper 1 Section 1 Question 2	An athlete gives their coach information about personal needs, goals, fitness level and motivation to assist in the development of the athlete's training program. Which principle of training is being applied? (A) variety (B) intensity (C) specificity (D) individuality

2022 Paper 1 Section 1 Question 3	The process allowing the body to overcome the effects of fatigue and increase readiness for competition or future training is (A) flexibility in training. (B) recovery in training. (C) warm down. (D) tapering

2022 Paper 1 Section 1 Question 4	Which feature in a training session is evident in the conditioning phase? (A) RAMP (B) dynamic stretching (C) work:rest ratios and repetitions (D) waste product removal and muscular relaxation

2022 Paper 1 Section 1 Question 5	The table shows an athlete's fitness testing results.

Fitness test	Standard				
	Poor	Below average	Average	Good	Excellent
Illinois agility test		✓			
Vertical jump test		✓			
Sit-up test (total in 1 minute)			✓		
12 m Cooper's run			✓		
Sit and reach test	✓				
Barbell squat (1 repetition max)					✓
Bench press (1 repetition max)				✓	
40 m sprint test		✓			

Which type of training would be most effective in addressing the athlete's biggest weakness?

(A) fartlek
(B) continuous
(C) flexibility
(D) resistance

2022 Paper 1 Section 1 Question 6	An athlete working at maximal intensity for 30 seconds, with 90 seconds rest between efforts, is using which training method? (A) fartlek training (B) sprint interval training (SIT) (C) aerobic interval training (AIT) (D) high-intensity interval training (HIIT)
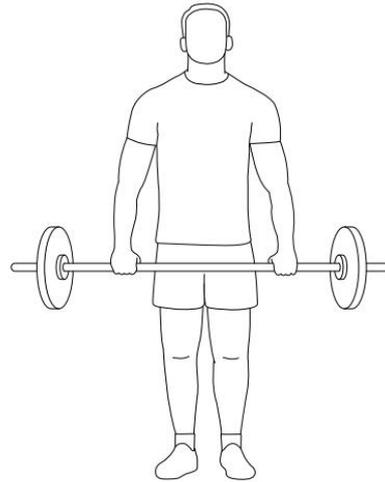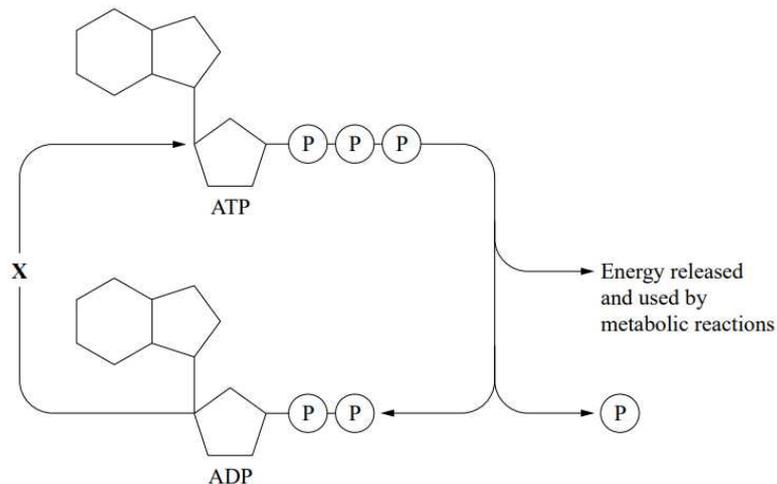
2022 **Paper 1** **Section 1** **Question 7**	Identify which combination of fitness components would be most beneficial in optimising the performance of both athletes in their sport. 100 m sprinter Weightlifter (A) muscular endurance, agility and power (B) power, aerobic capacity and strength (C) strength, power and flexibility (D) flexibility, power and agility
2022 **Paper 1** **Section 1** **Question 8**	Determine which option best describes the process occurring at X during ATP resynthesis. (A) ADP loses a phosphate molecule from the breakdown of CP. (B) ADP uses a phosphate molecule from the breakdown of CP to resynthesise ATP. (C) ATP uses a phosphate molecule from the breakdown of CP to resynthesise ADP. (D) ADP uses a phosphate molecule obtained from the breakdown of lactic acid to resynthesise ATP.

2022 Paper 1 Section 1 Question 9	What is occurring at Z?
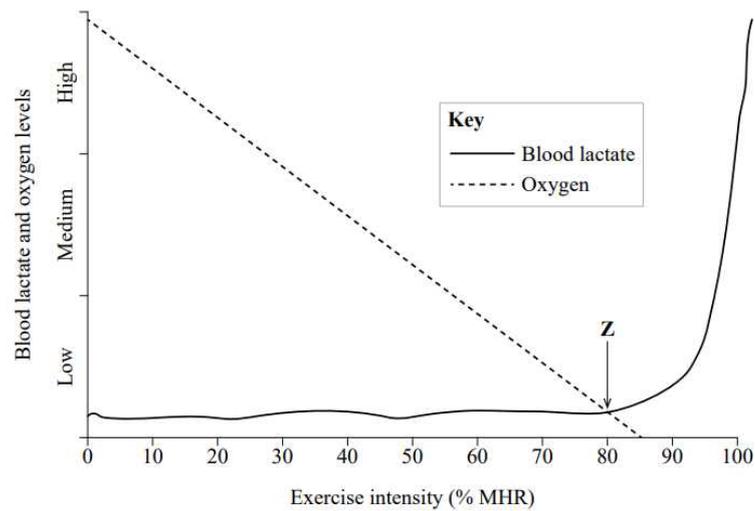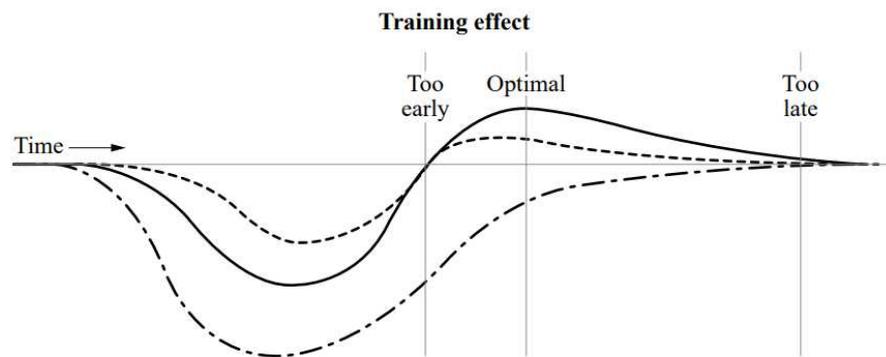
(A) VO$_2$ max
(B) aerobic capacity
(C) lactate threshold
(D) onset of blood lactate accumulation

2022 Paper 1 Section 1 Question 10	The graph shows the impact of three different intensity workouts during the tapering phase of training in the lead-up to competition.

It can be determined that

(A) optimum training effect is based on the individual and not a result of training manipulation.
(B) minimal reduction in training results in optimum training effect being lower and achieved earlier than required.
(C) excessive training during the tapering phase impacts an athlete's recovery and the training effect peaks prior to the required timeframe.
(D) minimal reduction in training in the lead-up to competition results in an athlete achieving optimal training effect by the desired timeframe.

| 2021 Paper 1 Section 1 Question 1 | Which option is best classified as a feature of a training session?

(A) frequency of training
(B) performance analysis
(C) tapering and recovery
(D) rise in body temperature |
|---|---|

2021 **Paper 1** **Section 1** **Question 2**	The RAMP approach to warming up before starting a training session refers to (A) raise, activate, mobilise, prepare. (B) rest, activate, mobilise, prepare. (C) rise, articulate, moderate, plan. (D) raise, activate, moderate, plan.

2021 **Paper 1** **Section 1** **Question 3**	The point at which lactic acid begins to accumulate in the muscles at a faster rate than it can be removed is known as (A) the aerobic threshold. (B) the lactate threshold. (C) anaerobic glycolysis. (D) lactate formation.

2021 **Paper 1** **Section 1** **Question 4**	According to the principle of *progressive overload*, what must happen before an increased load can be applied to a training program? (A) completion of the previous microcycle (B) adaptation to the previous training load (C) improvement in an authentic performance (D) training conducted within the aerobic energy system

2021 **Paper 1** **Section 1** **Question 5**	The key features of an effective warm-up include (A) conditioning and recovery. (B) low intensity and high duration. (C) muscle activation and dynamic stretching. (D) reduced heart rate and removal of waste products from exertion.

2021 **Paper 1** **Section 1** **Question 6**	Energy for physical activity is provided by the interplay of three energy systems. During this interplay, the body uses energy from food to continuously (A) release energy from ATP. (B) release energy from ADP. (C) resynthesise ADP and phosphate into ATP. (D) resynthesise ATP and phosphate into ADP.

The table contains features of each energy system.

Energy system	ATP–PC	lactic acid	aerobic
Anaerobic/aerobic	anaerobic	anaerobic	aerobic
Fuel/energy source	ATP–PC	?	fat and glucose
By-products	creatine	?	CO_2 and water
Intensity	very high	?	low to moderate
Duration	10–15 seconds	?	3 minutes onwards
Examples of physical activities	short sprints, swimming sprints	800 m and 1500 m running events	endurance events, running, cycling

Which option accurately completes the table of features?

(A)

Fuel/energy source	glycogen
By-products	lactic and pyruvic acid
Intensity	high
Duration	up to 3 minutes

(B)

Fuel/energy source	fat
By-products	lactic and pyruvic acid
Intensity	very high
Duration	up to 3 minutes

(C)

Fuel/energy source	glycogen
By-products	water
Intensity	moderate
Duration	1–2 minutes

(D)

Fuel/energy source	fat
By-products	CO_2 and water
Intensity	very high
Duration	30 seconds

2021 Paper 1 Section 1 Question 8	The table shows four microcycles.

Microcycle 1	Run each day, with low-intensity continuous movement for a minimum of 1 hour.
Microcycle 2	Run every second day, with: • a minimum of 30 short (30-second) efforts • 1:3 work:rest (W:R) ratio.
Microcycle 3	Run each day, with: • 30 short efforts (30 seconds per effort) with 1:3 W:R ratio followed by • a low-intensity continuous run for a minimum of 1 hour.
Microcycle 4	Run every second day, with: • 30 short efforts with medium rest followed by • a low-intensity continuous run for a minimum of 1 hour.

Which 1-week microcycle would be most effective in maintaining aerobic capacity?

(A) Microcycle 1
(B) Microcycle 2
(C) Microcycle 3
(D) Microcycle 4

2021 Paper 1 Section 1 Question 9

The table shows combinations of energy system contributions for physical activities.

Physical activity	ATP–PC (%)	Lactic acid (%)	Aerobic (%)
1	80	15	5
2	98	2	0
3	50	44	6
4	85	15	0

Which list best represents the physical activities in the table?

(A) 100 m sprint, marathon run, 200 m sprint, Australian football
(B) 1500 m run, rowing, volleyball, 400 m freestyle swim
(C) baseball, diving, 200 m sprint, 100 m freestyle swim
(D) baseball, basketball, marathon run, diving

2021 Paper 1 Section 1 Question 10

An athlete is completing the training session shown in the table.

| Sets	3–6
Repetitions	4–6
Load	60–80%
Rest	3 minutes between sets
Speed	fast/explosive

Which component of fitness is being targeted?

(A) power
(B) strength
(C) flexibility
(D) muscular endurance

2020 Paper 1 Section 1 Question 1	Which of the following components of fitness best aligns with the aerobic energy system? (A) muscular endurance (B) strength (C) power (D) speed

2020 Paper 1 Section 1 Question 2	Which training method provides scope and flexibility for targeting a broad range of components of fitness? (A) circuit training (B) fartlek training (C) flexibility training (D) high-intensity interval training

2020 Paper 1 Section 1 Question 3	Lactate threshold is the exercise intensity at which (A) lactate enables VO_2 max. (B) lactic acid begins to increase. (C) ATP is removed from the muscles. (D) lactate begins to accumulate in the blood faster than it can be removed.

2020 Paper 1 Section 1 Question 4	A mesocycle is (A) shorter than a microcycle. (B) generally one week of training. (C) made up of a number of microcycles. (D) an organised description of activities in a time frame.

2020 Paper 1 Section 1 Question 5	Adenosine diphosphate (A) produces creatine phosphate. (B) is the molecule that provides energy. (C) is produced by the breakdown of ATP. (D) is specific to anaerobic energy systems.

2020 Paper 1 Section 1 Question 6	The training principle of individuality considers an individual's (A) fitness levels, goals and age. (B) motivation, skill and gender. (C) personal needs, motivation and gender. (D) goals, personal needs and fitness levels.

2020 Paper 1 Section 1 Question 7	During an invasion game, a player tracks their total distance travelled as 6.2 km. A game performance assessment instrument on the same match demonstrates that the player completed a total of 32 high-intensity sprints over distances ranging from 5 m to 20 m. The remainder of their performance mostly consisted of low-to-moderate-intensity running and walking. Which training method would most contribute to optimising the player's energy system requirements? (A) circuit training (B) fartlek training (C) continuous training (D) high-intensity interval training

2020 Paper 1 Section 1 Question 8	The graph shows the energy system contributions for two sporting events.

Energy system contributions for two events
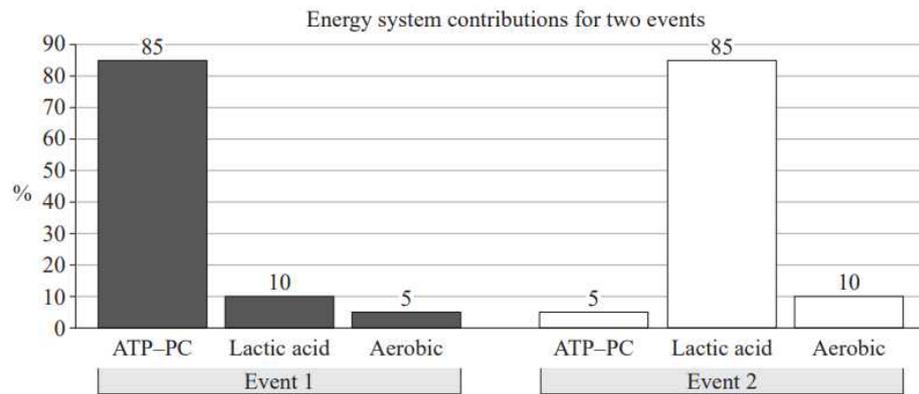
Which event pairing is best represented by the data?

	Event 1	Event 2
(A)	400 m sprint event	100 m sprint event
(B)	100 m sprint event	800 m running event
(C)	200 m sprint event	1500 m running event
(D)	110 m hurdle event	5000 m running event

2020 Paper 1 Section 1 Question 9	Which session most effectively addresses the objectives of a cool down?

Cool down 1	Cool down 2	Cool down 3	Cool down 4
1. 5 × 100 m runs (75%) 2. 10 × 50 m runs (40%) 3. lower-body static stretches, held for 15–30 seconds each	1. 800 m run (50%) 2. static stretches, held for 15–30 seconds each	1. static stretches, held for 15–30 seconds each 2. 800 m run (60%)	1. 800 m run (50%) 2. dynamic/active stretches

(A) Cool down 1
(B) Cool down 2
(C) Cool down 3
(D) Cool down 4

2020 Paper 1 Section 1 Question 10	The table outlines the energy system priorities for four different physical activity contexts.

Physical activity	Energy system priorities		
	ATP–PC	Lactic acid	Aerobic
Activity 1	moderate priority	moderate priority	high priority
Activity 2	high priority	low priority	low priority
Activity 3	high priority	moderate priority	moderate priority
Activity 4	moderate priority	high priority	low priority

Which option best represents the energy system priorities for a successful performance in an invasion game?

(A) Activity 1
(B) Activity 2
(C) Activity 3
(D) Activity 4

2023 Paper 1 Section 2 Question 11	Describe dynamic stretching and its role in preparing the body for exercise. Apply two specific examples to a physical activity context. (11 marks)

2023 Paper 1 Section 2 Question 12	a) Describe two contributions fitness testing makes in developing athlete training programs. [4 marks]
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b) Demonstrate how the identified contributions in Question 12a) can be applied to specialised movement sequences in a position- or event-specific context of your choice. [6 marks]

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Annual training plan						
Phases of training	Preparatory			Competition		Transition
Sub-phases	General preparation		Specific preparation	Pre-competition	Competition	Transition

I   II   III

a) Identify the labelled elements of the annual training plan. [3 marks]

I. _____

II. _____

III. _____

b) Explain how the elements identified in Question 13a) contribute to targeting specific, or a series of, energy and/or fitness requirements within a designated timeframe. [9 marks]

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2022 **Paper 1** **Section 2** **Question 11**	Explain the aims of the cool down feature of a training session. [6 marks]

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Explain the aims of the cool down feature of a training session. [6 marks]

2022 **Paper 1** **Section 2** **Question 12**	Explain how data collection during games analysis can assist with planning in the remaining features of an effective individualised training program. [9 marks] _____

2022 **Paper 1** **Section 2** **Question 13**	Explain the interplay that occurs between energy systems during physical activity. Use indicators from the graph to support your answer. Identify three specialised movement sequences within a physical activity context and describe the connection of each sequence to a different energy system when optimising performance. [12 marks]

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2021
Paper 1
Section 2
Question 11
	The table shows gameplay data for an athlete for the first 15 weeks of the 25-week competition phase.
	
	Training notes/comments
	The athlete:
	   • completes all training sessions at a high level of exertion
	   • works on personally identified areas of fitness aimed at improving aerobic performance, in addition to team training
	   • presents on game days as fatigued and lethargic, producing progressively poorer performances throughout the season.
	
	a) Identify the reason for the athlete's declining performance during the competition phase. Support your response with four indicators from the information. [5 marks]
	
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	b) Devise modifications to optimise the athlete's performance in the remainder of the competition phase. Justify your modifications by referring to three principles of training. [9 marks]
	
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2021 Paper 1 Section 2 Question 12	

Training session design
Warm-up:
• 1 km jog — low intensity (50% maximum heart rate (MHR))
• 5 minutes dynamic stretching

Session:
Repeat × 5, 1-minute rest between efforts:
• 1500 m run at 80% MHR, no rest (active recovery)
• 500 m run at 50% MHR, no rest (active recovery)

Cool down:
• 500 m walk
• stretches

a) Determine the variation of interval training evident in the training session design. Support your response with an example from the training session. [2 marks]

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b) Evaluate how effectively the training session targets the specific energy and fitness requirements of a physical activity you have studied in Unit 4. Justify the maintenance or modification of the training session to meet the specific energy and fitness requirements of the selected physical activity. [12 marks]

Selected physical activity (and position, if applicable):
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2020 Paper 1 Section 2 Question 11	Explain how training intensity would change over the course of each of the four training phases. In your response, refer to how training zones and percentage of maximum heart rate (MHR) contribute to optimising performance at competition. [8 marks] _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

2020 **Paper 1** **Section 2** **Question 12**	a) Identify the component of fitness targeted by the mesocycle in Stimulus 1 in the stimulus book. Explain how four indicators from the stimulus support your identification. [5 marks] _____

b) Evaluate how training principles and energy systems are used to support the improvement of this component of fitness across the four-week training progression in Stimulus 1. Justify your response using the stimulus. [15 marks]

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2023 Paper 1 Section 3 Question 14	Consider the one-week competition phase training plan.

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
AM session	Interval training	Rest day	Fartlek training	Rest day	Interval training	Competition day	Recovery
PM session	Resistance training		Circuit training		Circuit training		

Select Monday, Wednesday or Friday from the training plan. Using the identified training methods for that day, develop two conditioning phase training sessions, specifically referencing specialised movement sequences within a physical activity that you have engaged with during Unit 4.

Justify by applying the features of the conditioning phase of a training session and the aims of the competition phase in your response.

Selected day: _____

Corresponding training sessions for your selected day

AM session: _____   PM session: _____

Physical activity context (position- or event-specific): _____

| | | 2022
Paper 1
Section 3
Question 14 | Analyse the tables to identify relevant components of fitness that the amateur athlete should focus on to optimise their competitive performance.

Devise two training sessions targeting the identified components of fitness. Apply the appropriate training methods and principles of training to both training sessions. Justify how the training sessions have been developed to complement the pursuit of optimal performance. Connect evidence from the tables and identified components of fitness in your response. [20 marks]

	Elite athlete	Amateur athlete
Minutes played	35	35
Total number of 0 to 10-second efforts (90% + MHR[1])	6	12
Total distance covered in 0 to 10-second efforts	70 m	50 m
Total distance covered during physical activity	4.2 km	2.2 km
Average heart rate	150 BPM[2]	170 BPM

Approximate heart rate ranges	
MHR range (%)	**Heart rate (BPM)**
40–50	81–101
51–60	102–122
61–70	123–142
71–80	143–162
81–90	163–182
91–100	183–203

_____

1 maximum heart rate
2 beats per minute

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2021 **Paper 1** **Section 3** **Question 13**	Analyse the position-specific or event-specific components of fitness relevant to optimal performance in a physical activity you have studied in Unit 4. Determine which two components are the most important to ensure optimal performance. Devise a two-session microcycle to optimise performance in a relevant specialised movement sequence in the selected physical activity context. Justify the selected training methods, principles of training and recovery principles. [14 marks] Selected physical activity (and position, if applicable):

2020 **Paper 1** **Section 3** **Question 13**	Use Stimulus 2 in the stimulus book to evaluate which athlete is more suited to the physical activity you have participated in during Unit 4. Devise a three-session microcycle to develop the athlete's components of fitness and energy system limitations to optimise their performance. Justify the design of your microcycle. [24 marks] Selected physical activity: _____

2023 Paper 1 Section 1 Question 1	Identify the feature of a training program where exercise is reduced prior to competition to ensure no negative impacts from fatigue. **(A) tapering – Answer** (B) recovery (C) work volume (D) specific training objectives

2023 Paper 1 Section 1 Question 2	Which training method for physical activity has direct links to mobilising joints to maintain and improve range of motion? (A) circuit training (B) fartlek training (C) interval training (D) flexibility training – **Answer**

2023 Paper 1 Section 1 Question 3	The table shows the combination of energy system contributions for different lengths of running races. 	Event	ATP-PC (%)	Lactic acid (%)	Aerobic (%)
---	---	---	---
100 m	53	44	3
200 m			
400 m	12	50	38
800 m	6	33	61 | Identify the contributions for the 200 m event. |	ATP-PC (%)	Lactic acid (%)	Aerobic (%)
---	---	---	---
(A)	15	45	40
(B)	30	60	10
(C)	45	32	23
(D)	50	44	6	 **Answer is B.**

2023 Paper 1 Section 1 Question 4	When ATP is resynthesised using muscle glycogen as the fuel in the absence of oxygen, the end product is (A) adenosine diphosphate. (B) creatine phosphate. (C) glucose. **(D) lactate. – Answer**

2023 Paper 1 Section 1 Question 5	The table shows an athlete's fartlek training session.

Step	Time (in minutes)	Activity
1	5	Hard run — 4:45 min per km pace
2	5	Easy slow jog
3	5	Hard run — 4:35 min per km pace
4	5	Walk
5	5	Hard run — 4:45 min per km pace
6	5	Easy slow jog

Identify what is occurring in steps 2, 4 and 6.

(A) warm-up
(B) cool down
(C) active recovery – Answer
(D) passive recovery

2023 Paper 1 Section 1 Question 6	An athlete is targeting the lactic acid system.

Activity	Description
1	1500 m run / 65% MHR
2	Rest for 2 minutes
3	30 m sprint x 12 Work:rest ratio 1:10

Identify what modification would allow the athlete to better train to their target.

(A) Increase the intensity of activity 1 and decrease the rest in the ratio for activity 3. – Answer
(B) Decrease the duration of activity 1 and decrease the rest in the ratio for activity 3.
(C) Increase the intensity of activity 1 and decrease the intensity of activity 3.
(D) Remove activity 2 and increase the sprint distance for activity 3.
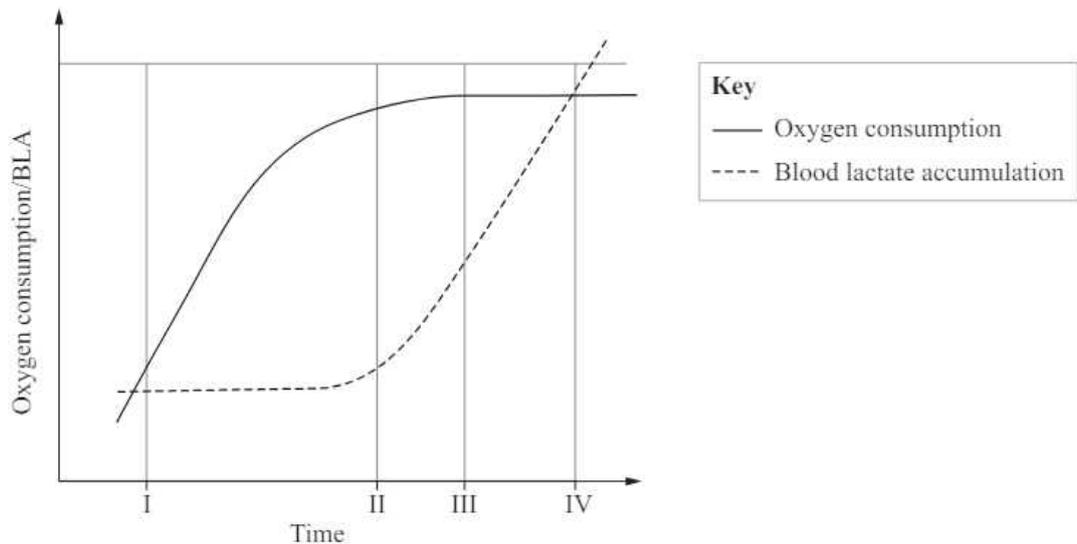
2023 Paper 1 Section 1 Question 7	The graph shows an athlete's oxygen consumption and blood lactate accumulation during exercise. Determine where the athlete first reaches their VO2 max. (A) I (B) II **(C) III – Answer** (D) IV

2023 Paper 1 Section 1 Question 8	Which training principle is used when an endurance runner introduces full-body resistance training to help improve motivation and muscle imbalances? (A) progressive overload **(B) individuality – Answer** (C) specificity (D) variety

2023 Paper 1 Section 1 Question 9	The table shows resistance-based training methods.

	1	2	3
Sets	3–6	2–3	2–6
Repetitions	4–6	12–15	2–4
Load	60–80%	50–65%	85–95%
Rest	3 minutes between sets	30 seconds between sets	3 minutes between sets

Which training methods correspond with each number?

	1	2	3
(A)	Muscular power	Muscular endurance	Muscular strength
(B)	Muscular power	Muscular strength	Muscular endurance
(C)	Muscular strength	Muscular endurance	Muscular power
(D)	Muscular strength	Muscular power	Muscular endurance

Answer is A.

Unit 4 – Energy, fitness and training and physical activity – Unit 4 – Topic 1: Energy, fitness and training integrated

2023 **Paper 1** **Section 1** **Question 10**	Identify the main limiting factor for continued exercise when operating above the lactate threshold. (A) glycogen depletion (B) aerobic system exhaustion (C) creatine phosphate accumulation **(D) lactic acid accumulation in the working muscles – Answer**

2022 **Paper 1** **Section 1** **Question 1**	An athlete measuring the amount of oxygen they can consume during gradual increases in exercise intensity is collecting data relating to **(A) VO_2 max. – Answer** (B) lactate threshold. (C) muscular endurance. (D) phosphocreatine resynthesis rate.

2022 **Paper 1** **Section 1** **Question 2**	An athlete gives their coach information about personal needs, goals, fitness level and motivation to assist in the development of the athlete's training program. Which principle of training is being applied? (A) variety (B) intensity (C) specificity **(D) individuality – Answer**

2022 **Paper 1** **Section 1** **Question 3**	The process allowing the body to overcome the effects of fatigue and increase readiness for competition or future training is (A) flexibility in training. **(B) recovery in training. – Answer** (C) warm down. (D) tapering

2022 **Paper 1** **Section 1** **Question 4**	Which feature in a training session is evident in the conditioning phase? (A) RAMP (B) dynamic stretching **(C) work:rest ratios and repetitions – Answer** (D) waste product removal and muscular relaxation

2022 Paper 1 Section 1 Question 5	The table shows an athlete's fitness testing results.

Fitness test	Standard				
	Poor	Below average	Average	Good	Excellent
Illinois agility test		✔			
Vertical jump test		✔			
Sit-up test (total in 1 minute)			✔		
12 m Cooper's run			✔		
Sit and reach test	✔				
Barbell squat (1 repetition max)					✔
Bench press (1 repetition max)				✔	
40 m sprint test		✔			

Which type of training would be most effective in addressing the athlete's biggest weakness?

(A) fartlek
(B) continuous
(C) flexibility – Answer
(D) resistance

2022 Paper 1 Section 1 Question 6	An athlete working at maximal intensity for 30 seconds, with 90 seconds rest between efforts, is using which training method? (A) fartlek training **(B) sprint interval training (SIT) – Answer** (C) aerobic interval training (AIT) (D) high-intensity interval training (HIIT)
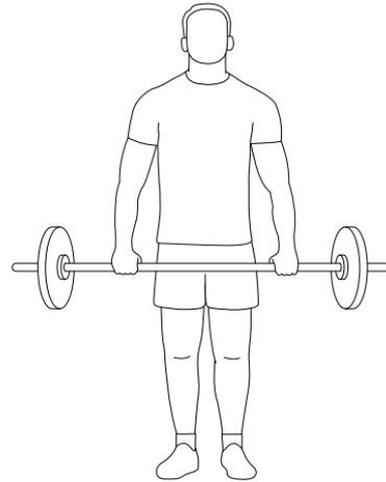
2022 **Paper 1** **Section 1** **Question 7**	Identify which combination of fitness components would be most beneficial in optimising the performance of both athletes in their sport. 100 m sprinter Weightlifter (A) muscular endurance, agility and power (B) power, aerobic capacity and strength **(C) strength, power and flexibility – Answer** (D) flexibility, power and agility
2022 **Paper 1** **Section 1** **Question 8**	Determine which option best describes the process occurring at X during ATP resynthesis. (A) ADP loses a phosphate molecule from the breakdown of CP. **(B) ADP uses a phosphate molecule from the breakdown of CP to resynthesise ATP. – Answer** (C) ATP uses a phosphate molecule from the breakdown of CP to resynthesise ADP. (D) ADP uses a phosphate molecule obtained from the breakdown of lactic acid to resynthesise ATP.
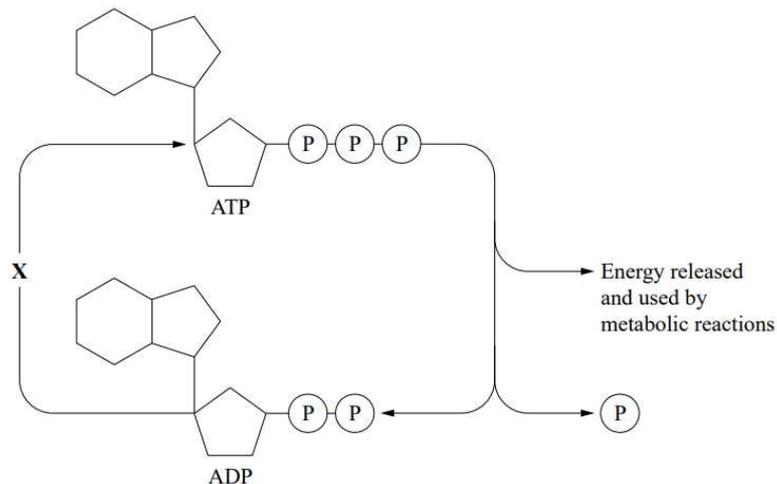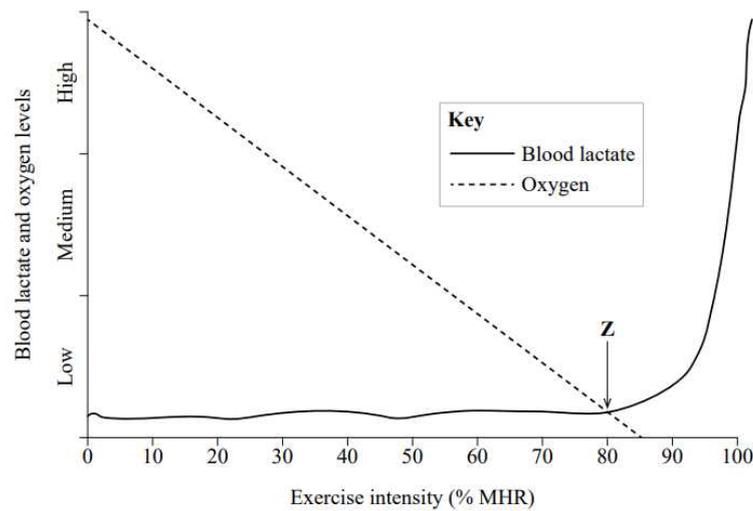
2022 **Paper 1** **Section 1** **Question 9**	What is occurring at Z? (A) VO$_2$ max (B) aerobic capacity (C) lactate threshold **(D) onset of blood lactate accumulation – Answer**
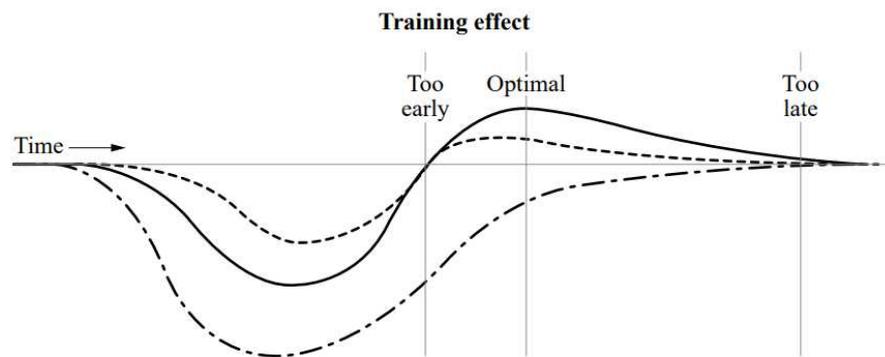
2022 **Paper 1** **Section 1** **Question 10**	The graph shows the impact of three different intensity workouts during the tapering phase of training in the lead-up to competition. It can be determined that (A) optimum training effect is based on the individual and not a result of training manipulation. **(B) minimal reduction in training results in optimum training effect being lower and achieved earlier than required. – Answer** (C) excessive training during the tapering phase impacts an athlete's recovery and the training effect peaks prior to the required timeframe. (D) minimal reduction in training in the lead-up to competition results in an athlete achieving optimal training effect by the desired timeframe.

2021 **Paper 1** **Section 1** **Question 1**	Which option is best classified as a feature of a training session? (A) frequency of training (B) performance analysis (C) tapering and recovery **(D) rise in body temperature – Answer**

2021 **Paper 1** **Section 1** **Question 2**	The RAMP approach to warming up before starting a training session refers to **(A) raise, activate, mobilise, prepare. – Answer** (B) rest, activate, mobilise, prepare. (C) rise, articulate, moderate, plan. (D) raise, activate, moderate, plan.

2021 **Paper 1** **Section 1** **Question 3**	The point at which lactic acid begins to accumulate in the muscles at a faster rate than it can be removed is known as (A) the aerobic threshold. **(B) the lactate threshold. – Answer** (C) anaerobic glycolysis. (D) lactate formation.

2021 **Paper 1** **Section 1** **Question 4**	According to the principle of *progressive overload*, what must happen before an increased load can be applied to a training program? (A) completion of the previous microcycle **(B) adaptation to the previous training load – Answer** (C) improvement in an authentic performance (D) training conducted within the aerobic energy system

2021 **Paper 1** **Section 1** **Question 5**	The key features of an effective warm-up include (A) conditioning and recovery. (B) low intensity and high duration. **(C) muscle activation and dynamic stretching. – Answer** (D) reduced heart rate and removal of waste products from exertion.

2021 **Paper 1** **Section 1** **Question 6**	Energy for physical activity is provided by the interplay of three energy systems. During this interplay, the body uses energy from food to continuously (A) release energy from ATP. (B) release energy from ADP. **(C) resynthesise ADP and phosphate into ATP. – Answer** (D) resynthesise ATP and phosphate into ADP.

The table contains features of each energy system.

Energy system	ATP–PC	lactic acid	aerobic
Anaerobic/aerobic	anaerobic	anaerobic	aerobic
Fuel/energy source	ATP–PC	?	fat and glucose
By-products	creatine	?	CO_2 and water
Intensity	very high	?	low to moderate
Duration	10–15 seconds	?	3 minutes onwards
Examples of physical activities	short sprints, swimming sprints	800 m and 1500 m running events	endurance events, running, cycling

Which option accurately completes the table of features?

(A)

Fuel/energy source	glycogen
By-products	lactic and pyruvic acid
Intensity	high
Duration	up to 3 minutes

(B)

Fuel/energy source	fat
By-products	lactic and pyruvic acid
Intensity	very high
Duration	up to 3 minutes

(C)

Fuel/energy source	glycogen
By-products	water
Intensity	moderate
Duration	1–2 minutes

(D)

Fuel/energy source	fat
By-products	CO_2 and water
Intensity	very high
Duration	30 seconds

Answer is A.

2021 Paper 1 Section 1 Question 8	The table shows four microcycles.

Microcycle 1	Run each day, with low-intensity continuous movement for a minimum of 1 hour.
Microcycle 2	Run every second day, with: • a minimum of 30 short (30-second) efforts • 1:3 work:rest (W:R) ratio.
Microcycle 3	Run each day, with: • 30 short efforts (30 seconds per effort) with 1:3 W:R ratio followed by • a low-intensity continuous run for a minimum of 1 hour.
Microcycle 4	Run every second day, with: • 30 short efforts with medium rest followed by • a low-intensity continuous run for a minimum of 1 hour.

Which 1-week microcycle would be most effective in maintaining aerobic capacity?

(A) Microcycle 1
(B) Microcycle 2
(C) Microcycle 3
(D) Microcycle 4 – Answer

2021 Paper 1 Section 1 Question 9

The table shows combinations of energy system contributions for physical activities.

Physical activity	ATP–PC (%)	Lactic acid (%)	Aerobic (%)
1	80	15	5
2	98	2	0
3	50	44	6
4	85	15	0

Which list best represents the physical activities in the table?

(A) 100 m sprint, marathon run, 200 m sprint, Australian football
(B) 1500 m run, rowing, volleyball, 400 m freestyle swim
(C) baseball, diving, 200 m sprint, 100 m freestyle swim – Answer
(D) baseball, basketball, marathon run, diving

2021 Paper 1 Section 1 Question 10

An athlete is completing the training session shown in the table.

Sets	3–6
Repetitions	4–6
Load	60–80%
Rest	3 minutes between sets
Speed	fast/explosive
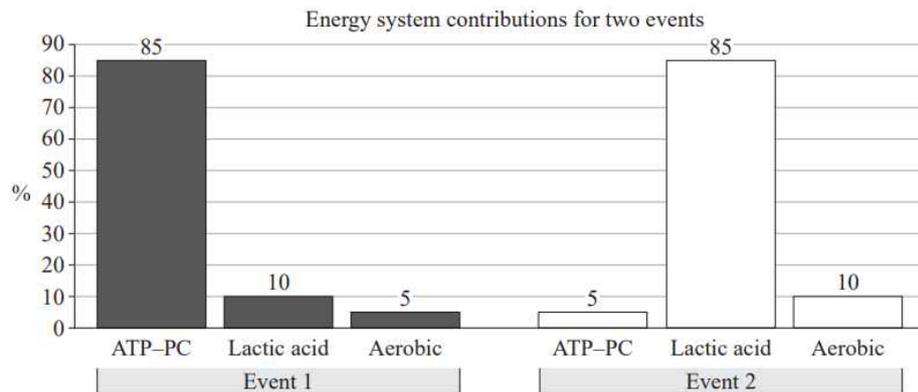
Which component of fitness is being targeted?

(A) power – Answer
(B) strength
(C) flexibility
(D) muscular endurance

2020 **Paper 1** **Section 1** **Question 1**	Which of the following components of fitness best aligns with the aerobic energy system? **(A) muscular endurance – Answer** (B) strength (C) power (D) speed

2020 **Paper 1** **Section 1** **Question 2**	Which training method provides scope and flexibility for targeting a broad range of components of fitness? **(A) circuit training – Answer** (B) fartlek training (C) flexibility training (D) high-intensity interval training

2020 **Paper 1** **Section 1** **Question 3**	Lactate threshold is the exercise intensity at which (A) lactate enables VO_2 max. (B) lactic acid begins to increase. (C) ATP is removed from the muscles. **(D) lactate begins to accumulate in the blood faster than it can be removed. – Answer**

2020 **Paper 1** **Section 1** **Question 4**	A mesocycle is (A) shorter than a microcycle. (B) generally one week of training. **(C) made up of a number of microcycles. – Answer** (D) an organised description of activities in a time frame.

2020 **Paper 1** **Section 1** **Question 5**	Adenosine diphosphate (A) produces creatine phosphate. (B) is the molecule that provides energy. **(C) is produced by the breakdown of ATP. – Answer** (D) is specific to anaerobic energy systems.

2020 **Paper 1** **Section 1** **Question 6**	The training principle of individuality considers an individual's (A) fitness levels, goals and age. (B) motivation, skill and gender. (C) personal needs, motivation and gender. **(D) goals, personal needs and fitness levels. – Answer**

2020 **Paper 1** **Section 1** **Question 7**	During an invasion game, a player tracks their total distance travelled as 6.2 km. A game performance assessment instrument on the same match demonstrates that the player completed a total of 32 high-intensity sprints over distances ranging from 5 m to 20 m. The remainder of their performance mostly consisted of low-to-moderate-intensity running and walking. Which training method would most contribute to optimising the player's energy system requirements? (A) circuit training **(B) fartlek training – Answer** (C) continuous training (D) high-intensity interval training

2020 Paper 1 Section 1 Question 8	The graph shows the energy system contributions for two sporting events. Energy system contributions for two events Which event pairing is best represented by the data? |	Event 1	Event 2
(A)	400 m sprint event	100 m sprint event
(B)	100 m sprint event	800 m running event
(C)	200 m sprint event	1500 m running event
(D)	110 m hurdle event	5000 m running event | **Answer is B.**
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2020 Paper 1 Section 1 Question 9	Which session most effectively addresses the objectives of a cool down? | Cool down 1	Cool down 2	Cool down 3	Cool down 4
1. 5 × 100 m runs (75%) 2. 10 × 50 m runs (40%) 3. lower-body static stretches, held for 15–30 seconds each	1. 800 m run (50%) 2. static stretches, held for 15–30 seconds each	1. static stretches, held for 15–30 seconds each 2. 800 m run (60%)	1. 800 m run (50%) 2. dynamic/active stretches | (A) Cool down 1 **(B) Cool down 2 – Answer** (C) Cool down 3 (D) Cool down 4
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2020 Paper 1 Section 1 Question 10	The table outlines the energy system priorities for four different physical activity contexts. | Physical activity	Energy system priorities		
	ATP–PC	Lactic acid	Aerobic
Activity 1	moderate priority	moderate priority	high priority
Activity 2	high priority	low priority	low priority
Activity 3	high priority	moderate priority	moderate priority
Activity 4	moderate priority	high priority	low priority | Which option best represents the energy system priorities for a successful performance in an invasion game? (A) Activity 1 (B) Activity 2 **(C) Activity 3 – Answer** (D) Activity 4
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2023 **Paper 1** **Section 2** **Question 11**	Describe dynamic stretching and its role in preparing the body for exercise. Apply two specific examples to a physical activity context. (11 marks)

Sample response	The response
Dynamic stretching uses functional movements to prepare muscles for more intense activity. It mimics the movements you're about to make as part of your training session, allowing the athlete to warm up specific muscles. It is a gentle way to ease into a workout; therefore, it should be low intensity. In the context of a midfielder in football, examples may include leg swings or walking lunges. These target the major muscle groups required for football, in addition to mimicking the actions of kicking and running. This would prepare the body for exercise by gradually raising body temperature and increasing blood flow to the working muscles. Warming up may also help reduce muscle soreness, lessen your risk of injury and aid post-session recovery.	• defines dynamic stretching **[1 mark]** • describes characteristics relating to the role of dynamic stretching in preparing the body for exercise **[1 mark]** • identifies one example of dynamic stretching from a physical activity context **[1 mark]** • explains how one example of dynamic stretching prepares the body for exercise in the physical activity context **[1 mark]** • identifies a second example of dynamic stretching from a physical activity context **[1 mark]** • explains how a second example of dynamic stretching prepares the body for exercise in the physical activity context **[1 mark]**

2023 Paper 1 Section 2 Question 12

a) Describe two contributions fitness testing makes in developing athlete training programs. [4 marks]

Sample response	The response, for the first contribution	The response, for the second contribution
Fitness testing makes various contributions to developing athlete training programs. Fitness testing can help determine athlete performance capabilities by establishing baseline test results prior to commencing a general fitness development training program. Repeating fitness testing can measure improvement of targeted fitness components throughout a training program. Additionally, fitness testing can be used for specific athlete objectives identified during game analysis/performance evaluation or when returning from injury. The process of using fitness testing to identify areas that will underpin the w/r, duration and intensity of training sessions within a program ensures appropriate sequencing.	[2 marks] • provides characteristics and features of a contribution fitness testing makes to developing athlete training programs	[2 marks] • provides characteristics and features of a second contribution fitness testing makes to developing athlete training programs
	[1 marks] • identifies a role fitness testing contributes to developing athlete training programs **OR** • provides a characteristic of how fitness testing contributes to developing athlete training programs	[1 marks] • identifies a second role fitness testing contributes to developing athlete training programs **OR** • provides a characteristic of how fitness testing contributes to developing athlete training programs
	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

b) Demonstrate how the identified contributions in Question 12a) can be applied to specialised movement sequences in a position- or event-specific context of your choice. [6 marks]

Sample response	The response	The response
In volleyball, the outside hitter needs to have high explosive power to optimise the height and power of a spike, along with high agility to assist in blocking defence and opposition movements. Fitness testing for this position could determine baseline test results for these attributes and other relevant fitness components using tests for power and agility, such as the vertical jump test, the seated medicine ball throw and the Illinois agility test. From this ongoing and targeted data collection, a coach creates the opportunity to track growth across a training program. Fitness testing can also be used to devise training sessions. Training objectives specific to the athlete can be optimised with the required training methods and principles of training. Fitness testing results can be used to identify growth or maintenance areas for the athlete in various stages of training or when recovering from injury and pursuing a return to preinjury fitness. An example of this is a blocker in volleyball completing a vertical jump test to determine if they have returned to preinjury heights or if further conditioning is required.	[3 marks] • applies one identified contribution of fitness testing to address specialised movement sequences in a position- or event-specific context	[3 marks] • applies a second identified contribution of fitness testing to address specialised movement sequences in a position- or event-specific context
	[2 marks] • describes the appropriate application of one identified contribution of fitness testing to address specialised movement sequences in a position- or event-specific context	[2 marks] • describes the appropriate application of a second identified contribution of fitness testing to address specialised movement sequences in a position- or event-specific context
	[1 marks] • identifies a feature of applying one identified contribution of fitness testing	[1 marks] • identifies a feature of applying a second identified contribution of fitness testing
	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

Annual training plan					
Phases of training	Preparatory		Competition		Transition
Sub-phases	General preparation	Specific preparation	Pre-competition	Competition	Transition

I   II   III

a) Identify the labelled elements of the annual training plan. [3 marks]

Sample response	The response
1. Mesocycle 2. Microcycle 3. Training sessions	• correctly identifies one element **[1 mark]** • correctly identifies a second element **[1 mark]** • correctly identifies a third element **[1 mark]**

b) Explain how the elements identified in Question 13a) contribute to targeting specific, or a series of, energy and/or fitness requirements within a designated timeframe. [9 marks]

Sample response	The response	The response
Mesocycles come from the sub-phases. These training periods are generally 4–6 weeks long and have a specific training focus. Mesocycles are generally made up of three to four microcycles. Microcycles are the shortest training cycles. These generally last one week and have a more specific training focus, targeted using numerous training sessions. It allows for a focused block of training. Training sessions are the organised description of activities that will occur during the identified timeframe. Training sessions detail the specific way appropriate training methods and principles should be used. When consideration is given to each of these parts, you can achieve the optimal training environment.	[3 marks] • explains the contribution of mesocycles in targeting specific, or a series of, energy and/or fitness requirements within a designated timeframe as part of an annual plan	[3 marks] • explains the contribution of microcycles in targeting specific, or a series of, energy and/or fitness requirements within a designated timeframe as part of an annual plan
	[2 marks] • describes the contribution of mesocycles to an annual plan	[2 marks] • describes the contribution of microcycles to an annual plan
	[1 marks] • identifies a feature of a mesocycle	[1 marks] • identifies a feature of a microcycle
	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

| 2022 Paper 1 Section 2 Question 11 | Explain the aims of the cool down feature of a training session. [6 marks] |

Sample Response	The response
The cool down feature of a training session aims to use gentle cardiovascular exercise and stretching to slow down body exertion, gradually reducing heart rate and body temperature to resemble pre-exercise rates more closely. This allows the body to commence tissue repair and the process of replenishing energy stores. This process also allows the muscles to relax, assisting in the removal of waste products such as lactic acid, contributing to a more effective rate of recovery.	[6 marks] • discerningly explains the aims of the cool down feature
	[5 marks] • explains the aims of the cool down feature
	[4 marks] • describes the aims of the cool down feature
	[3 marks] •describes some aims of the cool down feature OR • identifies all aims of the cool down feature
	[2 marks] • identifies some aims of the cool down feature
	[1 mark] • identifies one aim of the cool down feature
	[0 marks] • does not satisfy any of the descriptors above.

2022 Paper 1 Section 2 Question 12	Explain how data collection during games analysis can assist with planning in the remaining features of an effective individualised training program. [9 marks]

Sample Response	The response	The response	The response
Data collection during games analysis greatly assists with delivering an effective individualised training program. Specifically, it can be used to ensure the identification of specific training objectives for the athlete, determine work volumes, frequency, intensity and duration of sessions elements, and provide key insights into the formation of individualised tapering and recovery objectives. Data collection can be used to identify an athlete's strengths and weaknesses in related components of fitness. Once identified, the training program can be individually tailored to ensure there is a focus on improving weaknesses and maintaining strengths. The training program then becomes solely focused on the athlete's individual needs. This can then be used to set and measure specific training objectives, ensuring the delivery of an effective individualised training program. Once the data has been used to establish specific training objectives, the training program can then manipulate work volume, frequency, duration and intensity of set training activities to cater for the identified components of fitness requiring training. For example, if an effort determines they require a focus on being able to work for longer periods at submaximal levels, the program will modify their duration and frequency to suit accordingly, e.g. 70% MHR for 45 minutes. Games analysis data can also provide individualised insight into the specific tapering and recovery requirements of an athlete. The data can indicate preor post-game recovery requirements of the athlete and be used to determine individualised tapering periods to optimise game performance.	[3 marks] • explains how games analysis data can be used to assist in developing individualised and specific training objectives to achieve a desired outcome	[3 marks] • explains how games analysis data can be used to assist in developing individualised work volume, frequency, intensity and duration to achieve a desired outcome	[3 marks] • explains how games analysis data can be used to assist in developing individualised tapering and recovery plans to achieve a desired outcome
	[2 marks] • describes how games analysis data can be used to assist in planning individualised and specific training objectives to achieve a desired outcome	[2 marks] • describes how games analysis data can be used to assist in planning individualised work volume, frequency, intensity and/or duration to achieve a desired outcome	[2 marks] • describes how games analysis data can be used to assist in planning individualised tapering and/or recovery plans to achieve a desired outcome
	[1 mark] • identifies a feature of games analysis for meeting specific training objectives	[1 mark] • identifies a feature of game analysis for individualising work volume, frequency, intensity and/or duration	[1 mark] • identifies a feature of game analysis for individualising tapering and/or recovery plans
	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

| 2022 Paper 1 Section 2 Question 13 | Explain the interplay that occurs between energy systems during physical activity. Use indicators from the graph to support your answer. |
| | |

Identify three specialised movement sequences within a physical activity context and describe the connection of each sequence to a different energy system when optimising performance. [12 marks]

Sample Response	The response	The response	The response
The graph shows the ATP/PC system uses an anaerobic pathway, with stored ATP and resynthesised ATP as the primary energy provider for maximal efforts at approximately 8–10 secs. At approximately 8 seconds, an interplay emerges as the dominant energy system then becomes the lactic acid system. This pathway is also an anaerobic energy system, using muscle glycogen as the fuel to resynthesise ATP, in a process called anaerobic glycolysis. During periods of work lasting longer than 90 seconds, the dominant energy system then becomes the aerobic energy system. This energy system is used in activities requiring approximately 75% of MHR or lower and uses oxygen and carbohydrates within the process of glycolysis to resynthesis ATP in fuelling the working muscles. Basketball requires a continuous interplay across all energy systems as the player moves between maximal, submaximal and aerobic intensities through the performance. The fast break in basketball uses the ATP/PC system. In this movement sequence, maximal efforts are required for short explosive periods, creating and exploiting space. This provides the	[6 marks] • discerningly explains the interplay between energy systems during physical activity using extensive indicators from the graph	[3 marks] • identifies 3 appropriate specialised movement sequences within a physical activity context	[3 marks] • describes the connections between the identified movement sequences and each energy system for optimising performance
	[5 marks] • explains the interplay between energy systems during physical activity using indicators from the graph	[2 marks] • identifies 2 appropriate specialised movement sequences within a physical activity context	[2 marks] • describes the connections between the identified movement sequences and 2 energy systems for optimising performance OR • identifies 2/3 connections between identified movement sequences and an energy system
	[4 marks] • describes the interplay between energy systems during physical activity using extensive indicators from the graph	[1 mark] • identifies an appropriate specialised movement sequence within a physical activity context	[1 mark] • identifies a connection between an identified movement sequence and an energy system

		[3 marks] • describes the interplay between energy systems during physical activity using indicators from the graph	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.
	player the opportunity to score without opposition pressure. Moving down the court and driving into the key uses the lactic acid system. This movement sequence requires sharp increases of intensity to create attacking options. Effective performance of this movement sequence would allow ongoing production of submaximal efforts above the anaerobic threshold (80–85% MHR). The continuous nature of court movements without stationary rest relies on the aerobic system. This optimises the athlete's performance in transitioning and dribbling up and down the court.	[2 marks] • describes the interplay between energy systems		
		[1 mark] • identifies a feature from the graph OR • identifies a feature of the interplay between energy systems		
		[0 marks] • does not satisfy any of the descriptors above.		

2021 Paper 1 Section 2 Question 11	The table shows gameplay data for an athlete for the first 15 weeks of the 25-week competition phase. Training notes/comments The athlete: • completes all training sessions at a high level of exertion • works on personally identified areas of fitness aimed at improving aerobic performance, in addition to team training • presents on game days as fatigued and lethargic, producing progressively poorer performances throughout the season. a) Identify the reason for the athlete's declining performance during the competition phase. Support your response with four indicators from the information. [5 marks]

Sample Response	The response
The athlete is overtraining. Completion of all training sessions at the highest intensity, in addition to further training sessions to target identified aerobic areas, have adverse effects on the athlete's readiness to perform. The athlete is presenting with increased fatigue and lethargy that has resulted in a decrease in distance covered and minutes played per game from 60 min/16 km to 50 min/9 km. Errors have increased from 3 per game to 8 per game. The athlete's inability to recover fully before competition has resulted in this observable decline in performance.	**For identification of reason:** [1 mark] • states that the athlete is overtraining [0 marks] • does not satisfy any of the descriptors above **For support referring to indicators:** [4 marks] • use of 4 indicators to support the statement [3 marks] • use of 3 indicators to support the statement [2 marks] • use of 2 indicators to support the statement [1 mark] • use of 1 indicator to support the statement [0 marks] • does not satisfy any of the descriptors above

b) Devise modifications to optimise the athlete's performance in the remainder of the competition phase. Justify your modifications by referring to three principles of training. [9 marks]

Sample Response	The response, for the first training principle	The response, for the second training principle	The response, for the third training principle
To prevent overtraining and optimise performance, modifications must target frequency, intensity and duration. Frequency refers to the number and regularity of training sessions. To allow the athlete to better recover, the number of sessions should be reduced by removing the additional aerobic sessions. These cause fatigue and may be directly responsible for the decline in distance run.	[3 marks] • provides a detailed justification of how this training principle will address the identified key indicator/s	[3 marks] • provides a detailed justification of how this training principle will address the identified key indicator/s	[3 marks] • provides a detailed justification of how this training principle will address the identified key indicator/s
The athlete completes all training sessions at the highest level of exertion. To assist recovery before game day, the intensity of some sessions throughout the week should be at or below the ATZ — 75% maximum heart rate (MHR) — and some sessions working in or above the anaerobic zone (75–85% MHR). This variety in the intensities will assist athlete recovery.	[2 marks] • describes how this training principle will address the identified indicator/s	[2 marks] • describes how this training principle will address the identified indicator/s	[2 marks] • describes how this training principle will address the identified indicator/s
	[1 mark] • identifies a feature of a training principle	[1 mark] • identifies a feature of a training principle	[1 mark] • identifies a feature of a training principle
Session duration needs to be reduced to assist the athlete's recovery. Duration and recovery periods do not allow for full recovery, as indicated by the athlete's fatigue and lethargy.	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

Training session design
Warm-up:
• 1 km jog — low intensity (50% maximum heart rate (MHR))
• 5 minutes dynamic stretching

Session:
Repeat × 5, 1-minute rest between efforts:
• 1500 m run at 80% MHR, no rest (active recovery)
• 500 m run at 50% MHR, no rest (active recovery)

Cool down:
• 500 m walk
• stretches

a) Determine the variation of interval training evident in the training session design. Support your response with an example from the training session. [2 marks]

Sample Response	The response
The duration and intensity are in the aerobic threshold with sections of higher intensity. Based on the above features, this variation of interval training is aerobic interval training.	[2 marks] • determines that the interval training variation is aerobic interval training, using features from the stimulus to support the response
	[1 mark] • states that the interval training variation is aerobic interval training OR • identifies a feature/s of aerobic interval training from the stimulus
	[0 marks] • does not satisfy any of the descriptors above.

b) Evaluate how effectively the training session targets the specific energy and fitness requirements of a physical activity you have studied in Unit 4. Justify the maintenance or modification of the training session to meet the specific energy and fitness requirements of the selected physical activity. [12 marks]

Sample Response	The response, for evaluation	The response, for justification
Selected physical activity (and position, if applicable): Volleyball, hitter This session would be ineffective in targeting the specific energy and fitness requirements of a hitter in volleyball. The session targets the aerobic energy system and focuses more on the endurance-based fitness components. A hitter in volleyball requires a focus on the anaerobic energy systems to enable general movement around the court with intermittent explosive contractions. The hitter position does not require continuous effort periods of this duration or intensity.	[6 marks] • provides a critical evaluation of the effectiveness of aerobic interval training in targeting the specific energy and fitness requirements of the selected physical activity	[6 marks] • provides a discerning justification of the maintenance or modification of the training session in targeting the energy and fitness requirements of the selected physical activity • demonstrates insightful use of examples linked to the selected physical activity or positional/event movement sequences
	[5 marks] • evaluates the effectiveness of aerobic interval training in targeting the specific energy and fitness requirements of the selected physical activity	[5 marks] • justifies the maintenance or modification of the training session in targeting the energy and fitness requirements of the selected physical activity • demonstrates appropriate use of examples linked to the selected physical activity or positional/event movement sequences
	[4 marks] • explains the effectiveness of aerobic interval training, or another identified interval training variation, in targeting the specific energy and fitness requirements of the selected physical activity	[4 marks] • explains the maintenance or modification of the training session in targeting the energy and fitness requirements of the selected physical activity • provides appropriate use of examples linked to the selected physical activity or positional/event movement sequences OR

	• justifies the maintenance or modification of the training session in targeting the energy OR fitness requirements of the selected physical activity • provides appropriate use of examples linked to the selected physical activity or positional/event movement sequences
[3 marks] • describes the effectiveness of aerobic interval training using features of the targeted physical activity in targeting the specific energy OR fitness requirements of the selected physical activity	[3 marks] • explains the maintenance or modification of the training session in targeting the energy OR fitness requirements of the selected physical activity • provides superficial use of examples linked to the selected physical activity OR • describes the interval training variation in targeting the energy and fitness requirements of the selected physical activity
[2 marks] • identifies features of aerobic interval training • identifies features of the energy OR fitness requirements of the selected physical activity	[2 marks] • identifies features of the selected physical activity related to energy and fitness requirements
[1 mark] • identifies a feature of aerobic interval training OR • identifies a feature of the energy OR fitness requirements of the selected physical activity	[1 mark] • identifies a feature of the selected physical activity
[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

2020 Paper 1 Section 2 Question 11	Explain how training intensity would change over the course of each of the four training phases.

In your response, refer to how training zones and percentage of maximum heart rate (MHR) contribute to optimising performance at competition. [8 marks]

Sample Response	The response	The response
The preparatory phase emphasises developing base fitness levels through a high volume of training performed at low-to-moderate intensity. The athlete trains in the aerobic training zone, with the target heart rate (THR) at 70–80% of maximum heart rate (MHR). Intensity slowly increases to ensure the focus remains on regaining base-level aerobic fitness. Training above this intensity too early may cause injury or issues with motivation. In the pre-competition phase, intensity increases and volume decreases as training becomes more targeted to specific movement sequences, enhancing specific movement strategies. In a typical pre-competition training session, heart rate (HR) should be well into the anaerobic training zone, at 80–90% of MHR.	[4 marks] • provides a discerning explanation of how the changes in the training zones optimise competitive performance	[4 marks] • provides a discerning explanation of how the changes in the percentage of maximum heart rate (MHR) optimise competitive performance
	[3 marks] • provides a considered explanation of how the changes in the training zones optimise competitive performance	[3 marks] • provides a considered explanation of how the changes in the percentage of MHR optimise competitive performance
	[2 marks] • provides a feasible explanation of how the changes in the training zones optimise competitive performance	[2 marks] • provides a feasible explanation of how the changes in the percentage of MHR optimise competitive performance
During the competition phase, the athlete performs at near MHR in the anaerobic zone, maximising performance outcomes through operating at an intensity reflecting competition performance requirements. Reducing the rest between exertions and increasing the magnitude of exertion allows for training that is more specific to the requirements of the activity. The training focuses on intensity, ensuring the athlete is not fatigued for competition. In the transition phase, the athlete's training goals are concerned with recovery from competition and maintaining a base level of fitness. During this phase, the athlete trains in the aerobic training zone, assisting recovery by maintaining a HR around 60% of MHR.	[1 mark] • provides a description of how a change in the training zones improves competitive performance	[1 mark] • provides a description of how a change in the percentage of MHR improves competitive performance
	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

2020 Paper 1 Section 2 Question 12	a) Identify the component of fitness targeted by the mesocycle in Stimulus 1 in the stimulus book. Explain how four indicators from the stimulus support your identification. [5 marks]

Sample Response	The response
The mesocycle targets muscular endurance. Muscular endurance is promoted by keeping the heart rate (HR) high for a long period of time. This mesocycle has many low-intensity and high repetition activities, which allows HR to remain high and movement to be extended over a longer time frame. This correlates to contractions being held for an extended time, requiring HR to remain high for longer. Many activities involve constant movement. This promotes elevated HR, while limited recovery time between activities also keeps HR high.	[5 marks] • identifies that muscular endurance is the component of fitness targeted in the mesocycle • explains 4 indicators that support the identified component of fitness
	[4 marks] • identifies a relevant component of fitness that would be targeted in the mesocycle • explains 3 indicators that support the identified component of fitness
	[3 marks] • identifies a relevant component of fitness that would be targeted in the mesocycle • provides a description of 2 indicators
	[2 marks] • identifies a relevant component of fitness that would be targeted in the mesocycle • provides a description of 1 indicator
	[1 mark] • identifies a component of fitness that would be targeted in the mesocycle OR • identifies a relevant indicator present in the mesocycle
	[0 marks] • does not satisfy any of the descriptors above.

b) Evaluate how training principles and energy systems are used to support the improvement of this component of fitness across the four-week training progression in Stimulus 1. Justify your response using the stimulus. [15 marks]

Sample Response	The response	The response	The response
The volume is increasing with the increased weight in the back squats and increased repetitions in the box jumps. By increasing volume, we target increased adaptations through progressive overload. Limited rest between repetitions does not permit sufficient recovery for repeated maximal efforts. This infers power and strength will be reduced in consecutive sets/efforts, targeting muscular endurance. Heart rate (HR) stays high, operating at or above threshold. The work periods are relatively short, not developing cardiovascular endurance. Work:rest ratios are increasing in the back squats, because the repetitions are decreasing; however, the work:rest ratios	[5 marks] • provides a discerning justification of how the training principles support the improvement of the component of fitness	[5 marks] • provides a discerning justification of how the energy system supports the improvement of the component of fitness	[5 marks] • provides a critical evaluation of the effectiveness of the mesocycle and uses comprehensive evidence from the stimulus to support evaluative statements
	[4 marks] • provides a considered justification of how the training principles support the improvement of the component of fitness	[4 marks] • provides a considered justification of how the energy system supports the improvement of the component of fitness	[4 marks] • provides a considered evaluation of the effectiveness of the mesocycle and uses extensive evidence from the stimulus to support evaluative statements
	[3 marks] • provides a feasible justification of how the training principles support the improvement of the component of fitness	[3 marks] • provides a feasible justification of how the energy system supports the improvement of the component of fitness	[3 marks] • provides a feasible evaluation of the effectiveness of the mesocycle and uses detailed evidence from the stimulus to

are decreasing in the box jumps, because the repetitions are increasing, while rest remains constant.

Intensity is increasing in the back squats, which will increase muscular fatigue prior to beginning the box jumps. As the repetitions of box jumps increase, athlete fatigue increases. This targets muscular endurance through progressive overload. Muscular endurance is optimised using the lactic acid system, as the work has a longer duration than more explosive power-based or strength-based movements. The aerobic system also provides contributions to the energy requirements; however, due to the work periods being short, it is not a primary contributor. This mesocycle supports improvements in muscular endurance through focusing on the required energy system, building of lactate tolerance and repeated contractions against a resistance. | | | support evaluative statements |
	[2 marks] • provides a superficial justification of how the training principles support the improvement of the component of fitness	[2 marks] • provides a superficial justification of how the energy system supports the improvement of the component of fitness	[2 marks] • provides a superficial evaluation of the effectiveness of the mesocycle and uses evidence from the stimulus to support evaluative statements
	[1 mark] • provides a description of how the training principles support the improvement of the component of fitness	[1 mark] • provides a description of how the energy system supports the improvement of the component of fitness	[1 mark] • identifies a relevant piece of information about training principles or energy systems OR • identifies evidence from the stimulus that relates to a training principle or energy systems
	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

2023 Paper 1 Section 3 Question 14	Consider the one-week competition phase training plan.

Consider the one-week competition phase training plan.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
AM session	Interval training	Rest day	Fartlek training	Rest day	Interval training	Competition day	Recovery
PM session	Resistance training		Circuit training		Circuit training		

Select Monday, Wednesday or Friday from the training plan. Using the identified training methods for that day, develop two conditioning phase training sessions, specifically referencing specialised movement sequences within a physical activity that you have engaged with during Unit 4.

Justify by applying the features of the conditioning phase of a training session and the aims of the competition phase in your response.

Sample response, for one training session	The response, for a second training session	The response	The response
[4 marks] • provides a detailed first training session for the selected day • provides an insightful application of the training method • discerningly explains the relationship to specific movement sequences within the selected context	[4 marks] • provides a detailed second training session for the selected day • provides an insightful application of the training method • discerningly explains the relationship to specific movement sequences within the selected context	[4 marks] • provides discerning reasons for decisions connecting the developed training sessions to all features of the conditioning phase of a training session	[4 marks] • provides discerning reasons for decisions connecting the developed training sessions to the role of the competition phase
[3 marks] • provides an appropriate first training session for the selected day • provides a considered application of the training method • explains the relationship to specific movement sequences within the selected context	[3 marks] • provides an appropriate second training session for the selected day • provides a considered application of the training method • explains the relationship to specific movement sequences within the selected context	[3 marks] • provides considered reasons for decisions connecting the developed training sessions to features of the conditioning phase of a training session	[3 marks] • provides considered reasons for decisions connecting the developed training sessions to the role of the competition phase
[2 marks] • provides an appropriate first training session for the selected day • provides a feasible application of the training method • describes the relationship to specific movement sequences within the selected context	[2 marks] • provides an appropriate second training session for the selected day • provides a feasible application of the training method • describes the relationship to specific movement sequences within the context	[2 marks] • describes features of the conditioning phase of a training session connecting to the developed training sessions	[2 marks] • describes features of the competition phase connecting to the developed training sessions
[1 mark] • provides a feasible application of a training	[1 mark] • provides a feasible application of a second	[1 mark]	[1 mark]

method in a training session	training method in a training session	• identifies a feature of the conditioning phase of a training session	• identifies a feature of the competition phase of periodisation
[0 marks] • does not satisfy any of descriptors the above.	[0 marks] • does not satisfy any of descriptors the above.	[0 marks] • does not satisfy any of descriptors the above.	[0 marks] • does not satisfy any of descriptors the above.

2022
Paper 1
Section 3
Question 14

Analyse the tables to identify relevant components of fitness that the amateur athlete should focus on to optimise their competitive performance.

Devise two training sessions targeting the identified components of fitness. Apply the appropriate training methods and principles of training to both training sessions. Justify how the training sessions have been developed to complement the pursuit of optimal performance. Connect evidence from the tables and identified components of fitness in your response. [20 marks]

	Elite athlete	Amateur athlete
Minutes played	35	35
Total number of 0 to 10-second efforts (90% + MHR[1])	6	12
Total distance covered in 0 to 10-second efforts	70 m	50 m
Total distance covered during physical activity	4.2 km	2.2 km
Average heart rate	150 BPM[2]	170 BPM

Approximate heart rate ranges	
MHR range (%)	**Heart rate (BPM)**
40–50	81–101
51–60	102–122
61–70	123–142
71–80	143–162
81–90	163–182
91–100	183–203

1   maximum heart rate
2   beats per minute

The response	The response	The response	The response
[5 marks] • provides a discerning analysis of the tables to synthesise meaning when identifying the relevant components of fitness • uses comprehensive evidence from the tables to support the identification of the relevant components of fitness	[5 marks] • provides two training sessions • provides a comprehensive description of the training sessions	[5 marks] • uses a range of training method/s and principles of training • provides a comprehensive explanation of the links between the training sessions and the correctly identified components of fitness	[5 marks] • provides a discerning justification of how the devised training sessions will optimise performance • demonstrates discerning use of the tables when linking to the identified components of fitness in the pursuit of optimal performance
[4 marks] • provides an analysis of the tables to identify the	[4 marks] • provides two training sessions	[4 marks]	[4 marks] • provides a considered justification of how the

relevant components of fitness • uses evidence from the tables to support the identification of the relevant components of fitness	• provides a detailed description of the training sessions	• uses a range of training method/s and principles of training • provides a detailed explanation of the links between the training sessions and the correctly identified components of fitness	devised training sessions will optimise performance • demonstrates considered use of the tables when linking to the identified components of fitness in the pursuit of optimal performance
[3 marks] • describes the tables when identifying the relevant components of fitness • identifies evidence from the tables	[3 marks] • provides two training sessions • provides an appropriate description of the training sessions	[3 marks] • uses training method/s and principles of training • provides an appropriate explanation of the links between the training sessions and the identified components of fitness	[3 marks] • provides an appropriate explanation of how the devised training sessions will optimise performance • demonstrates appropriate use of the tables when linking to the identified components of fitness in the pursuit of optimal performance
[2 marks] • identifies relevant components of fitness • identifies a relevant feature or features from the tables	[2 marks] • provides aspects of a training session • describes a feature of the training session	[2 marks] • identifies a training method and a principle of training • provides a description of a link between the training session/s and an identified component of fitness	[2 marks] • provides a feasible explanation of how the devised training session/s will optimise performance • demonstrates feasible use of the tables when linking to the identified components of fitness in the pursuit of optimal performance
[1 mark] • identifies a component of fitness OR • identifies a feature from the tables	[1 mark] • provides an aspect of a training session OR • identifies a feature of training sessions	[1 mark] • identifies a training method or a principle of training OR • provides a description of a link between the training session/s and an identified component of fitness	[1 mark] • provides a description of how the devised training session/s will optimise performance OR • identifies a feature from the tables linking to an identified component of fitness
[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.

	2021 Paper 1 Section 3 Question 13	Analyse the position-specific or event-specific components of fitness relevant to optimal performance in a physical activity you have studied in Unit 4. Determine which two components are the most important to ensure optimal performance.

Devise a two-session microcycle to optimise performance in a relevant specialised movement sequence in the selected physical activity context.

Justify the selected training methods, principles of training and recovery principles. [14 marks]

The response, for analysing components of fitness	The response, for devising a microcycle	The response, for justifying training methods, principles of training and recovery principles
[4 marks] • provides a discerning analysis of the relevant components of fitness for the selected physical activity • demonstrates discerning links to the position or event requirements • determines the two most important components of fitness for the selected physical activity	[4 marks] • provides a relevant two-session microcycle • explains the training sessions • makes discerning links to one specialised movement sequence in the physical activity context	[6 marks] • provides a discerning justification of the selected training methods, principles of training and recovery principles in optimising performance • demonstrates insightful use of evidence from the devised microcycle to support how the selected training methods, principles of training and recovery principles optimise performance • makes discerning links to one specialised movement sequence in the physical activity context
[3 marks] • explains the relevant components of fitness for the selected physical activity • demonstrates considered links to the position or event requirements • determines the two most important components of fitness for the selected physical activity	[3 marks] • provides a relevant two-session microcycle • describes the training sessions • makes considered links to one specialised movement sequence in the physical activity context	[5 marks] • justifies the selected training methods, principles of training and recovery principles in optimising performance • demonstrates appropriate use of evidence from the devised microcycle to support how the selected training methods, principles of training and recovery principles optimise performance • makes considered links to one specialised movement sequence in the physical activity context
[2 marks] • describes the relevant components of fitness for the selected physical activity • demonstrates feasible links to the position or event requirements OR • identifies relevant components of fitness for the selected physical activity • determines the two most important components of fitness for the selected physical activity	[2 marks] • provides a microcycle with a training session • describes the training sessions OR • identifies features of a training sessions • identifies a specialised movement sequence in the physical activity context	[4 marks] • justifies the selected training method/s and/or principle/s of training and/or recovery principle/s in optimising performance • demonstrates feasible use of evidence from the devised microcycle to support how the selected training method/s and principle/s of training and recovery principle/s to optimise performance • makes appropriate links to one specialised movement sequence in the physical activity context OR

		• explains the selected training methods, principles of training and recovery principles in optimising performance • demonstrates superficial use of evidence from the devised microcycle to support how the selected training methods, principles of training and recovery principles optimise performance in one specialised movement sequence in the physical activity context
[1 mark] • identifies relevant components of fitness for the selected physical activity OR • identifies features of the position or event	[1 mark] • identifies features of a training session OR • identifies a specialised movement sequence in the physical activity context	[3 marks] • explains the selected training method/s and/or principle/s of training and/or recovery principle/s in optimising performance • demonstrates superficial use of evidence from the devised microcycle to support how the selected training method/s, principle/s of training and recovery principle/s optimise performance in one specialised movement sequence in the physical activity context OR • describes the selected training methods and/or principles of training and/or recovery principles in optimising performance • demonstrates feasible use of evidence from the devised microcycle to support how the selected training methods, principles of training and recovery principles optimise performance in one specialised movement sequence in the physical activity context
[0 marks] • does not satisfy any of the descriptors above.	[0 marks] • does not satisfy any of the descriptors above.	[2 marks] • describes the training method/s and/or principle/s of training and/or recovery principle/s in optimising performance
		[1 mark] • identifies a feature from the microcycle aimed at improving performance
		[0 marks] • does not satisfy any of the descriptors above.

2020 **Paper 1** **Section 3** **Question 13**	Use Stimulus 2 in the stimulus book to evaluate which athlete is more suited to the physical activity you have participated in during Unit 4. Devise a three-session microcycle to develop the athlete's components of fitness and energy system limitations to optimise their performance. Justify the design of your microcycle. [24 marks]

Criterion: Recognise and explain [5 marks]

The response
[5 marks] • provides a critical evaluation of how the selected athlete's components of fitness align with the selected physical activity
[4 marks] • provides a considered evaluation of how the selected athlete's components of fitness align with the selected physical activity
[3 marks] • provides a feasible evaluation of how the selected athlete's components of fitness align with the selected physical activity OR • identifies specific movement sequences associated with the selected physical activity
[2 marks] • provides a superficial evaluation of how the selected athlete's components of fitness align with the selected physical activity OR • identifies movement sequences associated with the selected physical activity
[1 mark] • identifies a movement sequence associated with the selected physical activity
[0 marks] • does not satisfy any of the descriptors above.

Criterion: Analyse and synthesise - Training sessions [5 marks]

The response
[5 marks] • provides a relevant microcycle with an appropriate number of training sessions • provides a comprehensive description of the training sessions
[4 marks] • provides a relevant microcycle with an appropriate number of training sessions • provides a detailed description of the training sessions
[3 marks] • provides a microcycle with an appropriate number of training sessions • provides a description of the training sessions
[2 marks] • provides a microcycle with training sessions • provides a description of the training sessions
[1 mark] • provides a microcycle with training sessions
[0 marks] • does not satisfy any of the descriptors above.

Criterion: Analyse and synthesise - Components of fitness [4 marks]

The response
[4 marks] • uses a range of training methods • provides a comprehensive explanation of the links between the microcycle and the component of fitness
[3 marks] • uses a range of training methods • provides a detailed explanation of the links between the microcycle and the component of fitness
[2 marks] • uses a training method • provides a detailed explanation of the links between the microcycle and the component of fitness OR • uses a range of training methods • provides an explanation of the links between the microcycle and the component of fitness
[1 mark] • uses a training method • provides a description of a link between the microcycle and the component of fitness
[0 marks] • does not satisfy any of the descriptors above.

Criterion: Analyse and synthesise - Energy systems [4 marks]

The response
[4 marks] • uses a range of training methods • provides a comprehensive explanation of the links between the microcycle and the energy system
[3 marks] • uses a range of training methods • provides a detailed explanation of the links between the microcycle and the energy system
[2 marks] • uses a training method • provides a detailed explanation of the links between the microcycle and the energy system OR • uses a range of training methods • provides an explanation of the links between the microcycle and the energy system
[1 mark] • uses a training method • provides a description of a link between the microcycle and the energy system
[0 marks] • does not satisfy any of the descriptors above.

Criterion: Justify training strategies [6 marks]
The response
[6 marks] • provides a discerning justification of how the devised microcycle will optimise the athlete's competitive performance • uses comprehensive evidence from the stimulus to support the maintenance or modification of the microcycle
[5 marks] • provides a considered justification of how the devised microcycle will optimise the athlete's competitive performance • uses extensive evidence from the stimulus to support the maintenance or modification of the microcycle
[4 marks] • provides a feasible justification of how the devised microcycle will optimise the athlete's competitive performance • uses detailed evidence from the stimulus to support the maintenance or modification of the microcycle
[3 marks] • provides superficial justification of how the devised microcycle will optimise the athlete's competitive performance • uses evidence from the stimulus to support the maintenance or modification of the microcycle
[2 marks] • identifies features of the devised microcycle that will improve the athlete's competitive performance
[1 mark] • identifies a feature of the devised microcycle that will improve the athlete's competitive performance
[0 marks] • does not satisfy any of the descriptors above.