Neap

Trial Examination 2020

VCE Physical Education Units 3&4

Written Examination

Question and Answer Booklet

Reading time: 15 minutes
Writing time: 2 hours

Student's Name: _____

Teacher's Name: _____

Structure of booklet

Section	*Number of questions*	*Number of questions to be answered*	*Number of marks*
A	15	15	15
B	8	8	105
			Total 120

Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.

Students are NOT permitted to bring into the examination room: blank sheets of paper and/or correction fluid/tape.

No calculator is allowed in this examination.

Materials supplied

Question and answer booklet of 24 pages

Answer sheet for multiple-choice questions

Instructions

Write your **name** and your **teacher's name** in the space provided above on this page, and on the answer sheet for multiple-choice questions.

All written responses must be in English.

At the end of the examination

Place the answer sheet for multiple-choice questions inside the front cover of this booklet.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

SECTION A – MULTIPLE-CHOICE QUESTIONS

Instructions for Section A

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.
Choose the response that is **correct** or that **best answers** the question.
A correct answer scores 1; an incorrect answer scores 0.
Marks will **not** be deducted for incorrect answers.
No marks will be given if more than one answer is completed for any question.

Question 1
Which one of the following fuels produces the most amount of energy per molecule?

A. stored ATP and CP
B. glycogen
C. triglycerides
D. blood glucose

Question 2
Which one of the following improvements would be most important for a 100 m sprinter?

A. an increased reaction time
B. increased muscular endurance
C. a decreased reaction time
D. increased agility

Question 3
A characteristic of the autonomous stage of learning is

A. rapid improvement.
B. automatic performance of skills.
C. little focus on strategy and tactics.
D. a high level of variability in performance.

Question 4
A runner runs two laps around a 400 m running track, starting and ending at the same point.
Which row of the following table correctly shows the distance and displacement of the runner?

	Distance	Displacement
A.	800 m	0 m
B.	800 m	400 m
C.	400 m	0 m
D.	0 m	800 m

Question 5

Which one of the following statements about high-intensity interval training (HIIT) is correct?

A. HIIT results in aerobic-based chronic adaptations.

B. HIIT involves periods of high-intensity work followed by periods of reduced intensity recovery.

C. HIIT can be a more efficient aerobic training method than continuous training.

D. HIIT results in aerobic-based chronic adaptations, involves periods of high-intensity work followed by periods of reduced intensity recovery and can be a more efficient aerobic training method than continuous training.

Question 6

Melanie is competing at the national athletics championships in shot put.

Between her throws, Melanie is best to utilise a

A. passive recovery, as her ATP-CP system has been heavily used.

B. passive recovery, as her aerobic system has been heavily used.

C. active recovery, as her ATP-CP system has been heavily used.

D. active recovery, as her anaerobic glycolysis system has been heavily used.

Question 7

What types of training data should be recorded in a training diary?

A. physiological and sociocultural data

B. physiological and psychological data

C. psychological and emotional data

D. physiological, psychological and sociocultural data

Question 8

Which row of the following table gives an example of blocked and massed practice for a tennis player?

	Blocked practice	Massed practice
A.	performing two three-hour sessions per week	performing 20 tennis serves in a row
B.	performing 20 tennis serves in a row	performing seven one-hour sessions per week
C.	performing a forehand, then a backhand, then a volley	performing two three-hour sessions per week
D.	performing 20 tennis serves in a row	performing two three-hour sessions per week

Question 9

James is a rugby player. He finds that he is being knocked over too easily when tackled and wants to increase his stability.

What is one change that James could make?

A. bring his feet closer together to reduce his base of support

B. reduce the friction between himself and the ground

C. crouch slightly to lower his centre of gravity

D. reduce his body mass

Question 10

Which one of the following is an example of a third-class lever?

A. standing on tiptoes

B. the upward stage of a sit-up

C. tipping the head backwards

D. the downward stage of a sit-up

Question 11

A coach with a direct approach is most likely to

A. exert a high level of control over the training session.

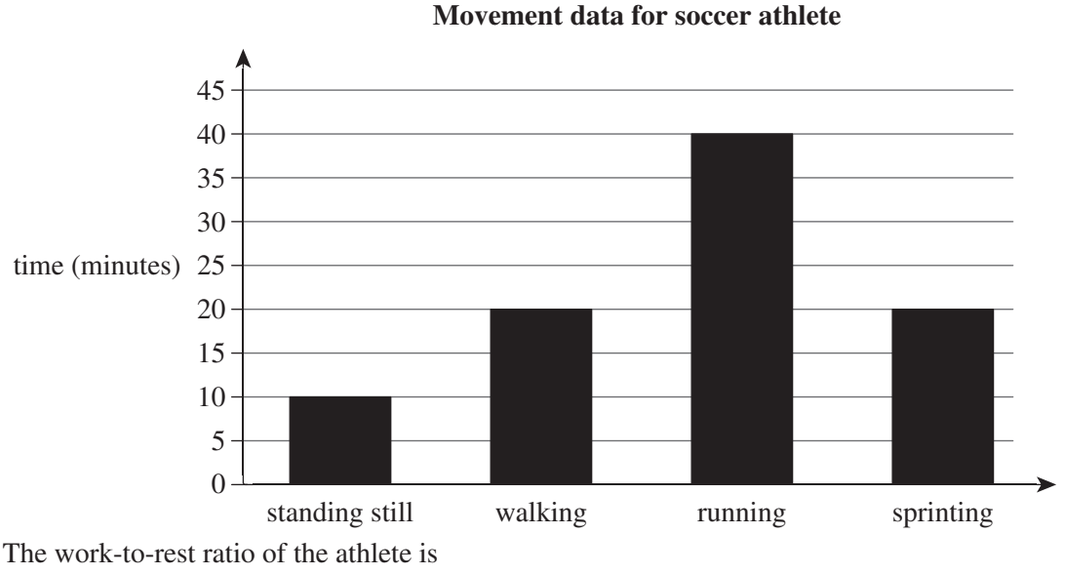
B. involve a lot of variability in the training session.

C. modify drills according to the strengths and weaknesses of the athletes.

D. provide little feedback to the athlete.

Question 12

A coach collected data on one soccer player's movement during a match. The data is shown in the graph below.



The work-to-rest ratio of the athlete is

A. 1 : 2

B. 1 : 4

C. 3 : 1

D. 2 : 1

Question 13

Which one of the following gives the four principles of qualitative movement analysis in the correct order?

A. evaluation, reliability, validity, error correction

B. preparation, observation, evaluation, error correction

C. intra-rater reliability, error correction, validity, accuracy

D. preparation, evaluation, error correction, observation

Question 14

A beginner athlete wants to improve muscular endurance through resistance training.

Which one of the following would be the best option for this athlete?

	Sets	Repetitions	Repetition weight (% of one repetition maximum)	Repetition speed
A.	1–3	10–12	70–80	slow to moderate
B.	1–3	10–12	60–70	slow to moderate
C.	1–3	15–25	40–60	slow to moderate
D.	1–3	3–6	30–60	fast

Question 15

How does the vertical acceleration of a projectile change once it is in flight, assuming upwards is positive?

A. The vertical acceleration does not change, it remains constant at 0 m/s^2.

B. The vertical acceleration is positive while the projectile is increasing in height, is zero at the peak of the flight, and then is negative when the projectile is decreasing in height.

C. The vertical acceleration is negative while the projectile is increasing in height, is zero at the peak of the flight, and then is positive when the projectile is decreasing in height.

D. The vertical acceleration does not change, it remains constant at –9.8 m/s^2.

END OF SECTION A

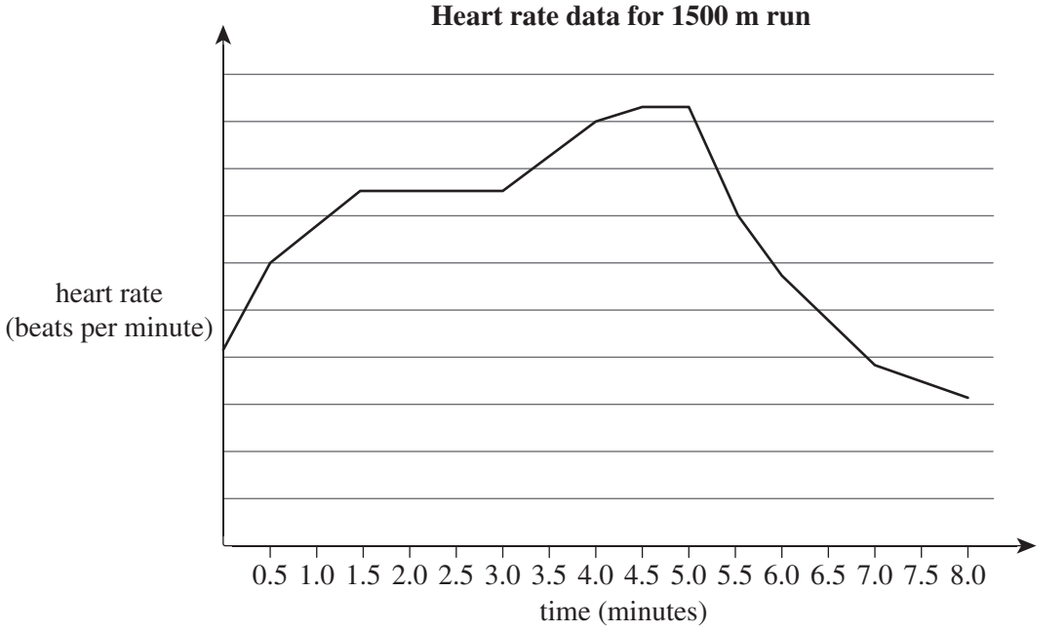
SECTION B

Instructions for Section B

Answer **all** questions in the spaces provided.

Question 1 (10 marks)

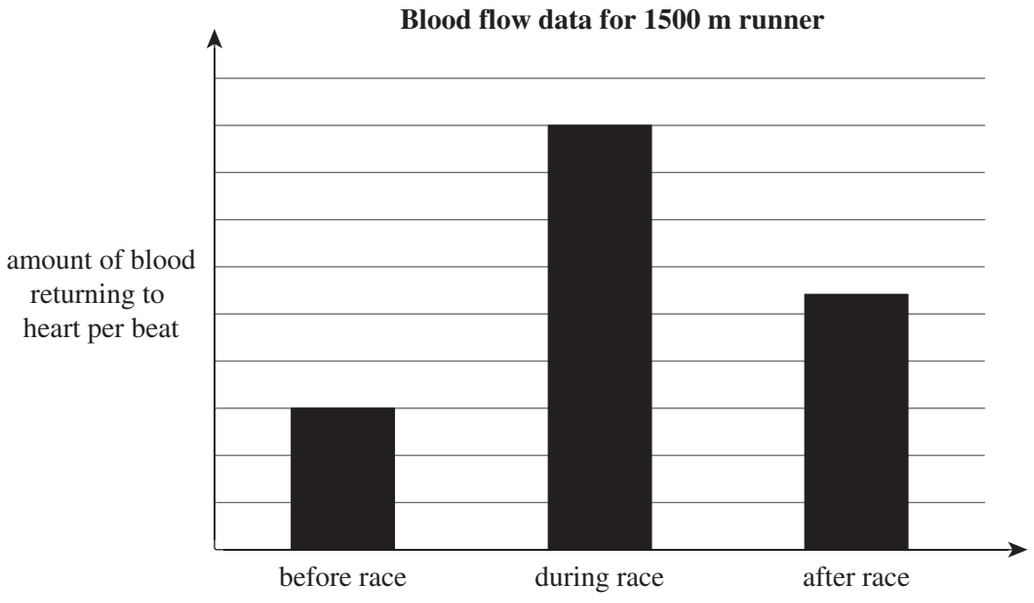
The heart rate data in the graph below was taken from a 1500 m runner during a race. The race finished at the five-minute mark of the graph.



a. On the graph above, shade and label where the following physical states would occur: oxygen deficit, excess post-exercise oxygen consumption (EPOC) and steady state. 3 marks

b. Identify **two** physiological changes that occur during periods of EPOC. 2 marks

c. The following data was taken from the 1500 m runner before, during and immediately after the race.



Identify the acute response shown in the graph above **and** explain **two** physiological mechanisms that allow this acute response to occur. 5 marks

Question 2 (6 marks)

The data shown in the following table was taken from a high jumper before and after an eight-week training program.

	Before training program	**After training program**
Average diameter of fast twitch muscle fibres (μm)	43.6	54.7
Oxidative enzyme muscle concentration (%)	2.3	2.4
Phosphocreatine stores (seconds worth)	8.9	11.2
Thickness of left ventricle wall (mm)	51	78
Blood volume (L)	5.2	5.2

a. Identify the type of training that is most likely to have caused the above changes. Use the data to support your answer. 3 marks

b. Explain how an increase in the average diameter of fast twitch muscle fibres would improve the performance of the high jumper. 3 marks

Question 3 (15 marks)

During a 10 m platform dive, a diver will often transition from a straight position into a tuck position.

a. How will moving from a straight position to a tuck position change the diver's moment of inertia, angular velocity and angular momentum? Explain your answers with reference to relevant formulae. 5 marks

b. At the 2008 Beijing Olympics, Australian diver Matthew Mitcham won a gold medal after receiving a record score for his final dive, which involved a back two-and-a-half somersault with a two-and-a-half twist.

Would Mitcham's dive best be classed as a discrete, serial or continuous motor skill? Justify your response. 2 marks

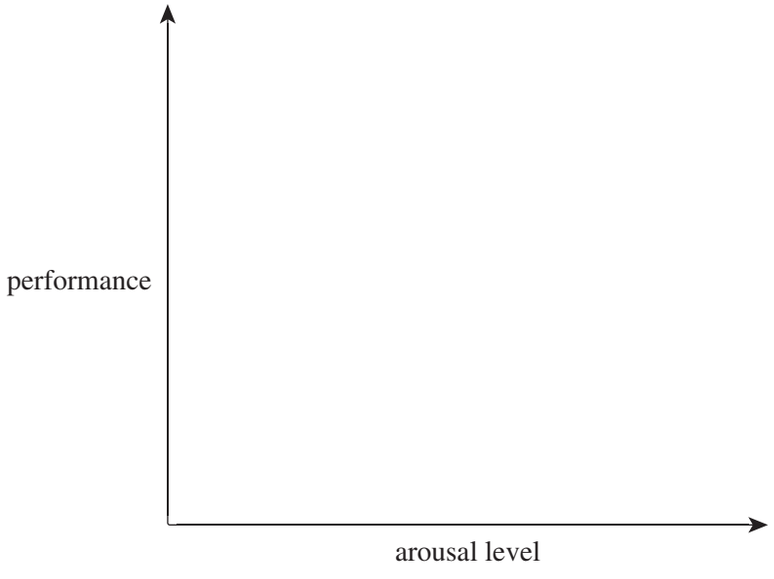
c. The following image shows a diver in a pike position during a 10-metre dive.

Source: Sandro Halank Wikimedia Commons (2018) CC BY-SA 4.0. Accessed July 2020. https://commons.wikimedia.org/wiki/File:2018-10-13_Jump_4_(Diving_Girls_10m_platform)_at_2018_Summer_Youth_Olympics_by_Sandro_Halank%E2%80%93087.jpg

Identify **two** fitness components that would be important for platform divers. Justify your response with reference to the image above. 4 marks

d. Explain how the optimal arousal levels for a platform diver would be different to the optimal arousal levels of an Australian Rules Football (AFL) player. 2 marks

e. Draw and label **two** inverted U-shapes on the axes below to show the optimal arousal level for a platform diver and an AFL player. 2 marks



Question 4 (9 marks)

The data shown in the following table was collected from a netballer and a triathlete.

	Netballer	Triathlete
Event duration (min)	45	150
Average heart rate (HR)(% of maximum HR)	87	72
Number of high-intensity efforts (above 85% maximum HR)	16	3
Total distance covered (km)	4.9	51.5
Glycogen stores remaining after event (%)	63	14
Blood lactate concentration (mmol/L)	6.4	2.2

a. Using the data above, compare the energy system usage and likely causes of fatigue for the netballer and the triathlete. 6 marks

b. Identify **one** acute muscular response that would occur for both athletes during their sport **and** explain how it would improve their performance. 3 marks

Question 5 (19 marks)

A tennis coach has multiple training groups for players. When a new player begins, they spend two months in group 1, and then move on to group 2. After they have spent two months in group 2, they move on to group 3, and so on.

a. The coach finds that the dropout rate of players is much higher in group 1 than in the later groups.

With reference to stages of learning, explain why this occurs. 3 marks

b. Outline the muscular contraction sequence that occurs during plyometric training. 2 marks

The coach wants to implement plyometric training into her training sessions for the more advanced groups.

c. Describe **two** exercises that could be performed during a plyometric training session. 2 marks

d. Outline **three** safety guidelines that the tennis players and coach should follow when conducting plyometric training. 3 marks

Aerobic power has been identified as an important fitness component for advanced tennis players.

e. Define the term 'aerobic power'. 1 mark

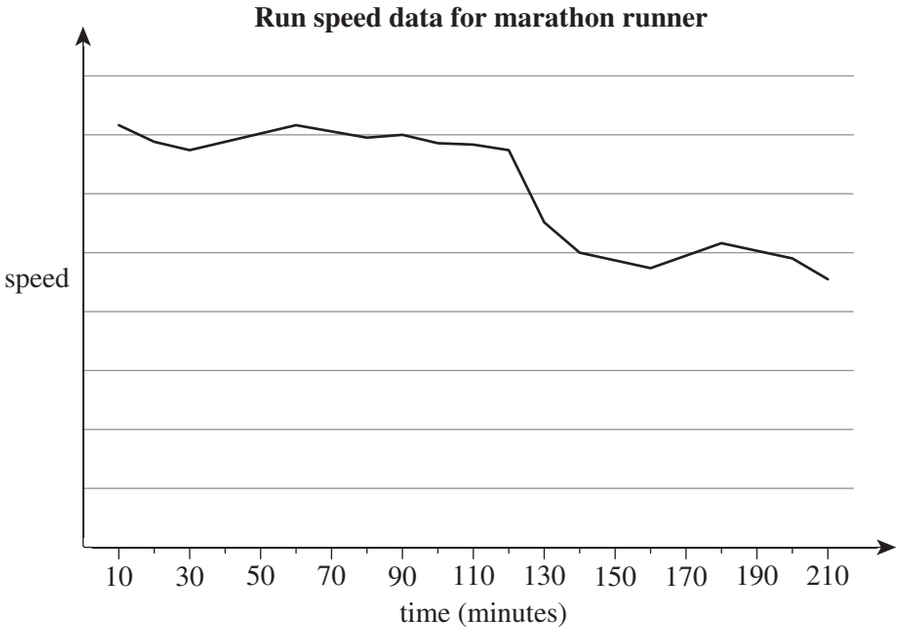
f. List **two** factors that affect an individual's level of aerobic power. 2 marks

g. Design an interval training session to improve the aerobic power of a tennis player. 3 marks

h. State **one** cardiovascular chronic adaptation that is likely to occur if the training session designed in **part g.** is performed consistently, **and** explain how this chronic adaptation would improve the performance of a tennis player. 3 marks

Question 6 (16 marks)

The following graph shows the speed of a runner while running a marathon.



a. Assuming the environment remained constant, explain **one** reason why the marathon runner's speed significantly decreased after approximately 120 minutes. 3 marks

Lelisa Desisa won the men's marathon event at the 2019 World Athletics Championships with a time of 2 hours, 10 minutes and 40 seconds. The marathon was run in temperatures near 30°C. Desisa's time was almost five minutes slower than his time at the 2018 New York Marathon, where the temperature was around 10°C.

b. With reference to the information above, explain why Desisa's time was slower in the 2019 World Athletics Championships. 3 marks

c. Explain why it would be important for Desisa to consume high-GI foods immediately after finishing a marathon. 3 marks

In October 2019, Eliud Kipchoge became the first person to run a marathon distance in under two hours, recording a time of 1 hour, 59 minutes and 40 seconds. Kipchoge ran the marathon on a specifically designed course with no uphill sections.

d. With reference to energy system usage and Newton's second law of motion, explain why a course with no uphill sections would assist Kipchoge to run the marathon in a faster time. State Newton's second law of motion as part of your response. 5 marks

e. During the run, a pace car with a laser provided Kipchoge with information about the shortest possible route around the track.

Outline what type of feedback this laser provided. 2 marks

Question 7 (20 marks)

Ebony, a 16-year-old hockey player, is designing a training program focused primarily on improving her aerobic power. She completes a series of fitness tests, and then writes and performs the following six-week training program.

	Session 1	Session 2	Session 3	Session 4
Week 1	30-minute run at 75% maximum HR	Circuit (3 sets with a 3-minute break between sets): • 20 push-ups • 20 sit-ups • 20 burpees • 20 box jumps • 20 star jumps	50-minute swim at 75% maximum HR	5-kilometre fartlek run
Week 2	Repeat week 1 sessions.			
Week 3	Repeat week 1 sessions.			
Week 4	30-minute run at 80% maximum HR	Circuit (3 sets with a 3-minute break between sets): • 22 push-ups • 22 sit-ups • 22 burpees • 22 box jumps • 22 star jumps	55-minute swim at 75% maximum HR	5-kilometre fartlek run
Week 5	Repeat week 4 sessions.			
Week 6	Repeat week 4 sessions.			

a. Identify the step that Ebony forgot to perform **and** explain how this will affect her training program. 3 marks

b. Identify **and** explain **two** training principles that Ebony has correctly incorporated into her training program. Your answer should refer to the data provided. 4 marks

c. Explain the role of a warm-up and a cool-down in Ebony's training sessions. 2 marks

Warm-up

Cool-down

Data recorded from Ebony and a professional female hockey player is shown in the following table.

	Ebony	Professional hockey player
Swing speed (m/s)	9	12
Weight of hockey stick used (g)	480	620
Average speed of hockey ball after being struck (m/s)	21	37

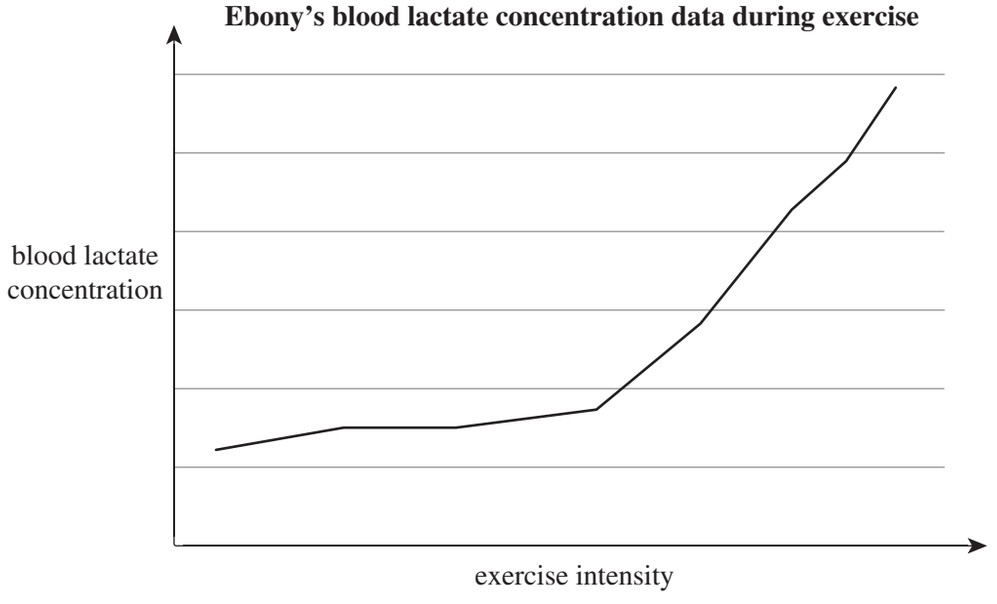
d. With reference to the data above and relevant biomechanical principles, explain why the professional hockey player hits the ball much faster than Ebony. 3 marks

e. Explain why junior hockey players often use smaller and lighter hockey sticks. 2 marks

Following her training program, Ebony decides that she wants to improve her lactate inflection point.

f. What is the meaning of 'lactate inflection point'. 1 mark

g. Label Ebony's lactate inflection point on the graph below. 1 mark



Ebony is arguing with her coach about how best to improve her lactate inflection point. Ebony believes she should be training anaerobically, while her coach believes she should be training aerobically.

h. State whether Ebony or her coach is correct. Justify your answer by contrasting the lactate inflection point with lactate tolerance **and** suggesting how the lactate inflection point and lactate tolerance should optimally be trained. 4 marks

Question 8 (10 marks)

Basketball is a sport in which two teams compete to try and shoot the basketball through the opposing teams' hoop, with 5 players from each team allowed on the court at the same time. The court is approximately 28 metres long and 15 metres wide, and each team's hoop is located at the centre of one of the short sides of the court. A game consists of four quarters of 10–20 minutes depending on the code, with frequent, short stoppages when the ball goes out of the court or when a time-out is called.

An activity analysis was performed on a basketball player during a game in which the quarters were 12 minutes long, and the data shown in the following table was collected.

Game duration (including breaks)	85 min
Total distance covered	8.9 km
W : R ratio	1 : 1
Time spent below 70% maximum heart rate	32 min
Time spent between 70–85% maximum heart rate	44 min
Time spent above 85% maximum heart rate	9 min
Total number of sprints	18
Total number of jumps	27

Using the information and data provided above, discuss:

- the role and interplay of energy systems during this basketball game;
- **one** important fitness component for a basketball player;
- **one** training method that should be used to improve performance in this fitness component, and;
- **two** chronic adaptations that are likely to result from this training method, **and** how they would improve the performance of the basketballer.

END OF QUESTION AND ANSWER BOOKLET

Neap

Trial Examination 2020

VCE Physical Education Units 3&4

Written Examination

Multiple-choice Answer Sheet

Student's Name: _____

Teacher's Name: _____

Instructions

Use a **pencil** for **all** entries. If you make a mistake, **erase** the incorrect answer – **do not** cross it out. Marks will **not** be deducted for incorrect answers.
No mark will be given if more than **one** answer is completed for any question.

All answers must be completed like this example: A B **C** D

Use pencil only

1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D