SHORE

Exam Number: ☐☐☐

Year 12

Personal Development, Health and Physical Education

HSC Trial Examination

2020

General instructions

- Reading time – 5 minutes
- Working time – 3 hours
- Write using black or blue pen
- Write your exam number at the top of this page

Total marks – 100

Section 1 Pages 3 - 15

60 marks

This section has two parts, Part A and Part B

Part A – 20 marks

- Attempt Questions 1 - 20
- Allow about 40 minutes for this section

Part B – 40 marks

- Attempt Questions 21 – 28
- Allow about 1 hour and 10 minutes for this part

Section 2 Pages 16 - 17

40 marks

- Attempt TWO questions from Questions 29 - 33
- Allow about one hour and 10 minutes for this section
- Complete each question from each option in separate booklets

Note: Any time you have remaining should be spent revising your answers.

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Section I

Part A – 20 marks
Attempt Questions 1 – 20
Allow about 40 minutes for this section

Use the multiple-choice answer sheet for Questions 1 – 20

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1 What is the name of the process of plaque building up on the inside walls of an artery called?

(A) Arteriosclerosis
(B) Atherosclerosis
(C) Angina pectoris
(D) Angioplasty

2 How is morbidity measured?

(A) Health surveys and reports, adult death rates, disability and handicaps
(B) Health surveys and reports, infant death rates, disability and handicaps
(C) Medicare statistics, health surveys and reports, disability and handicaps
(D) Medicare statistics, adult death rates, disability and handicaps

3 What type of stretching involves a held stretch, followed by an isometric contraction, followed by a held stretch?

(A) Static
(B) Ballistic
(C) PNF
(D) Dynamic

4 When identifying a health priority, the cost to the community needs to be considered. What would be a direct cost to the community?

(A) Absenteeism
(B) Money spent on prevention
(C) Retraining replacement staff
(D) Reduced work when employees are ill

5 Which energy system requires the anaerobic breakdown of glycogen?

(A) Aerobic
(B) Alactacid
(C) Glycolytic
(D) Lactic Acid

6 Observe the image.

How is the skill for the soccer player about to take a penalty kick best described?

(A) Discrete, gross and externally paced
(B) Continuous, open and self-paced
(C) Continuous, gross and externally paced
(D) Discrete, gross and self-paced

7 Which of the following is an example of a social justice principle in action?

(A) Increasing access to cancer treatment for rural patients
(B) Studying the number of young males involved in motor vehicle accidents
(C) Promoting the protective factors for cardiovascular disease
(D) Reducing the number of sick days due to asthma

8 Which of the following is an example of positive extrinsic motivation?

(A) Fear of being dropped from a team
(B) Prize money
(C) Increased self confidence
(D) Satisfaction of making a team

9 What is the cost to the patient of a bulk-billed General Practitioners visit?

(A) 15% of the scheduled fee
(B) 85% of the scheduled fee
(C) 100% of the scheduled fee
(D) No cost

10 Which of the following would be a valid test to assess the skills of a basketball player?

(A) Running 1.6km and recording the time taken
(B) Sprinting a series of 10m shuttles in a set time period
(C) Shooting 10 balls from the free throw line and recording accuracy
(D) Performing 5 vertical jumps and measuring the height jumped

11 Which of the following is a responsibility of the State and Territory Governments?

(A) Funding Medicare services provided by health practitioners
(B) Management of Public Hospitals
(C) Funding Pharmaceutical Benefits Scheme
(D) Management of research projects

12 A netball player observes the position of an opposing player's body and sprints to successfully intercept a pass. What characteristic of a skilled performer is this athlete demonstrating?

(A) Anticipation and timing
(B) Consistency
(C) Kinaesthetic sense
(D) Mental approach

13 What is a benefit of emerging new treatments and technologies on health care?

(A) Reduced cost for health care
(B) Greater access for all Australians
(C) Enabling early detection of diseases
(D) Less reliance on Medicare and Pharmaceutical Benefits Scheme

14 A long jumper 'imagines' the placement of their foot close to the take-off board prior to a jump. This psychological strategy is best described as?

(A) Concentration
(B) Goal setting
(C) Mental rehearsal
(D) Attention skills (focusing)

15 According to Australia's Health 2018, as a disease group, which of the following is the greatest contributor to mortality in Australia?

(A) Cancer
(B) Cardiovascular disease
(C) Diabetes
(D) Respiratory disease

16 After an event, what would an athlete's strategy be to achieve complete neural recovery?

(A) Relaxing muscles with hydrotherapy and hydration
(B) Relaxing muscles with hydrotherapy and massage
(C) Relaxing muscles with cryotherapy and massage
(D) Relaxing muscles with relaxation and cryotherapy

17 Which of the following is a limitation of epidemiology?

(A) It can only be interpreted by health professionals
(B) It identifies areas of inequity between population groups
(C) It promotes behaviours that have a positive impact on the health status of the population
(D) It does not provide accurate information regarding the quality of life of an individual

18 A coach is instructing a group of soccer players in the cognitive stage of skill acquisition. What should they focus on in their drills?

(A) Replicate the competition situation to help in a soccer game
(B) Improve the smoothness or fluency as the player's kinesthesis increases
(C) Practice the soccer skills randomly rather than in blocks
(D) Improve the feel for the desired movement and the learner's coordination when dribbling

19 Which of the following best describes the *Medicare levy surcharge*?

(A) A 2% levy on your taxable income, in addition to your tax paid on your income, to help fund the public health system
(B) The amount paid by the Federal Government for each Doctor's visit
(C) An extra surcharge on top of the Medicare levy for high income individuals and families who do not have an appropriate level of hospital insurance
(D) The premium charged by Private Health Insurers each month for Hospital and ancillary services

20 When would tactical decision making be a focus of skill acquisition?

(A) In the cognitive stage as learners will become familiar with the use of technology to playback performance for technique correction
(B) In the associative stage so that skills are learned and practised in a game context
(C) In the autonomous stage because repetition of skill drills helps build mental practice
(D) In the autonomous stage because learners need a proficient level of skill to understand tactics

Section I (continued)

Part B – 40 marks
Attempt Questions 21-28
Allow about 1 hour and 10 minutes for this part

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.
Extra writing space is provided on page 15. If you use this space, clearly indicate which question you are answering.

Question 21 (3 marks)
Describe how building healthy public policy can improve the health of Australians.

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Question 22 (4 marks)
Discuss the impact of a growing and ageing population on the availability of carers and volunteers.

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Question 23 (5 marks)
Compare the major causes of morbidity and mortality for males and females.

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Question 24 (8 marks)
Analyse the impact of socioeconomic determinants on cancer in Australia.

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Question 25 (3 marks)
Distinguish between anxiety and arousal.

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Question 26 (4 marks)
How can progressive overload and specificity be applied to strength training?

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Question 27 (5 marks)
Discuss the use of supplementation in an athlete's diet.

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Question 28 (8 marks)
Analyse the physiological adaptations that occur during a 6-week aerobic training program for an untrained athlete.

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Section I Part B extra writing space.

If you use this space, clearly indicate which question you are answering.

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Section II

40 marks
Attempt any TWO questions from Questions 29-33
Allow about 1 hour and 10 minutes for this section
Answer each part of each question in its own writing booklet (i.e. FOUR writing booklets in total). Extra writing books are available.

Your answers will be assessed on how well you:
■ demonstrate knowledge and understanding of health and physical activity concepts relevant to the question
■ apply the skills of critical thinking and analysis
■ communicate ideas and information using relevant examples
■ present a logical and cohesive response

Question 29 – The Health of Young People (20 marks)

(a) Explain the sociocultural and environmental determinants on ONE major health issue that impacts young people. **8**

(b) Analyse the skills and actions that enable young people to attain better health. **12**

Question 30 – Sport and Physical Activity in Australian Society (20 marks)

(a) Explain how physical activity and sport have influenced the lives and identities of Indigenous Australians.
8

(b) Analyse why sport is now viewed as a commodity. **12**

Question 31 – Sports Medicine (20 marks)

(a) Explain the processes the body uses to regulate its temperature during physical activity. **8**

(b) An athlete suffers a hamstring injury. Analyse the procedures required to successfully rehabilitate this injury. **12**

Question 32 – Improving Performance (20 marks)

(a) Evaluate safe and potentially harmful training procedures for TWO types of training. **8**

(b) Analyse how the elements of a training session could be modified to meet the ability of the athlete. **12**

Question 33 – Equity and Health (20 marks)

(a) Explain how the characteristics of a specific health promotion strategy will contribute to its potential for success. **8**

(b) Analyse how funding can be used to reduce the gap in the health of all Australians. **12**

End of Paper

SHORE

Year 12
Personal Development, Health and Physical Education

HSC Trial Examination 2020
Marking Guidelines

Section I
Part A

Multiple-choice Answer Key

Question	Answer
1	B
2	C
3	C
4	B
5	D
6	D
7	A
8	B
9	D
10	C
11	B
12	A
13	C
14	C
15	A
16	B
17	D
18	D
19	C
20	D

Multiple-choice Answer Key

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 ○
16	A ○	B ●	C ○	D ○
17	A ○	B ○	C ○	D ●
18	A ○	B ○	C ○	D ●
19	A ○	B ○	C ●	D ○
20	A ○	B ○	C ○	D ●

Section I
Part B

Question 21
Describe how building healthy public policy can improve the health of Australians.

Criteria	Marks
• Provides the characteristics and features of how building healthy public policy can improve the health of Australians • Provides relevant examples	3
• Sketches in general terms how building healthy public policy can improve the health of Australians • Provides examples	2
• Provides some relevant information about building healthy public policy and/or the health of Australians	1

Sample answer
Building healthy public policy refers to the different levels of government developing, introducing and implementing policies and legislation that prompt and support the Australian population to make good choices regarding their health.
This includes road safety laws like speed limits that ensure all road users are maintaining a safe speed limit for the road conditions and environment to prevent motor vehicle accidents. These road safety laws are enforced by the NSW Police and fines can be issued for non-compliant road users. The tax on cigarettes and alcohol is also designed to increase the cost of these products and this is designed to persuade people from purchasing these products.

Question 22
Discuss the impact of a growing and ageing population on the availability of carers and volunteers.

Criteria	Marks
• Identifies issues and provides points positives and negatives on the impact of a growing and ageing population on the availability of volunteers • Provides relevant examples	4
• Provides characteristics and features of the impact of a growing and ageing population on the availability of volunteers • Provides examples	2-3
• Sketches in general terms a growing and ageing population and/or the availability of volunteers	1

Sample answer
The proportion of older people (usually defined as 65+) in the Australian population is currently increasing. This is a result of an increasingly healthy population where the onset of chronic disease and illness has been delayed and life expectancy increased. This is due to healthy ageing which refers to the participation in a healthy lifestyle that promotes health and increases the quality of life as one ages.

A healthy population means that Australians can be more productive and contribute to the workforce (either in paid capacity or as a volunteer in the local community) for a longer period. Therefore, the older person can remain in the workforce or they may choose to retire if financially stable. These people could then assist in the community either at local community initiatives like Rotary Club or helping their family members by providing care to younger or older relatives. However, due to an increased population living with chronic disease and disability this may mean that the older person is not capable of volunteering and they may become more reliant on these volunteer services like meals on wheels and informal carers like family members.

Volunteer organisations like the Salvation Army are heavily reliant on donations and assistance. A growing and ageing population only increases the need for these organisations.

Question 23
Compare the major causes of morbidity and mortality for males and females.

Criteria	Marks
• Clearly demonstrates the similarities and differences of the major causes of morbidity and mortality for males and females • Provides relevant examples	5
• Demonstrates the similarities and differences of the major causes of morbidity and mortality for males and females • Provides examples	4
• Sketches in general terms the major causes of morbidity and mortality for males and females • Provides limited examples	2-3
• Provides some relevant information about morbidity AND/OR mortality for males and females	1

Sample answer
Females have a life expectancy approximately 4 years greater than males and experience different health outcomes. Males are more likely than females to engage in risky health behaviours like smoking and alcohol consumption and die prematurely. Males are also more likely to be homeless or in custody. Compared with females, males experienced more of their total disease burden due to dying early from disease and injury than from living with disease.

The major causes of morbidity for males aged above 45+ years include coronary heart disease and for males aged 5 – 44 years the major cause of disease burden is suicide and self-inflicted injuries whereas the major causes of morbidity for females is dementia (85+ years), coronary heart disease (65-84 years), musculoskeletal conditions (45-64 years),
anxiety disorders (5-44 years).

Breast cancer is the most commonly diagnosed cancer for females and prostate cancer for men. However, lung cancer is the leading cause of cancer death for both males and females. Similar proportions of males and females are classified as obese and this will have serious health consequences for the individual. More males are overweight than females and more females are of normal weight than males.

The major causes of mortality for males are coronary heart disease, lung cancer and dementia whereas the leading causes of mortality for females are dementia, coronary heart disease and cerebrovascular disease (stroke). With domestic violence, one woman is killed each week by a past or future partner in comparison to one male per month.

Question 24
Analyse the impact of socioeconomic determinants on cancer in Australia.

Criteria	Marks
• Clearly identifies the relevant socioeconomic determinants and extensively draws out how these determinants impact on cancer in Australia • Provides relevant examples • Presents ideas in a clear and logical way	8
• Identifies the socioeconomic determinants and draws out how these determinants impact on cancer in Australia • Provides examples	6-7
• Provides the characteristics and features of the socioeconomic determinants and the impact of these on cancer in Australia • Provides limited examples	4-5
• Sketches in general terms some of the determinants and may include the impact on cancer in Australia	2-3
• Provides some relevant information about determinants and/or cancer	1

Sample answer
Cancer refers to a large group of diseases that are characterised by the uncontrolled growth and spread of normal cells. The most common forms of cancer are lung cancer, breast cancer and skin cancer. The socioeconomic determinants that impact the potential for contracting cancer include education, income and employment.

People who have lower levels of education have lower levels of health literacy and are less aware of the risk factors and protective factors for a range of cancers. They may also not be aware of preventative screening procedures like mammograms and pap smears that could assist the early detection of the cancers and thus earlier treatment that will result in more desired outcome than if the cancer is detected when it has progressed and is stage 4. Lower levels of education also limit opportunities for employment. People who work outside have greater exposure to the sun, which places them at higher risk for skin cancers. People who work with other known sources of radiation, such as X-ray or are around electromagnetic fields also have a higher risk of cancer.

People who are unemployed also have higher rates of smoking, physical inactivity and poor diet that are risk factors for a variety of cancers including lung cancer and bowel cancer. Blue-collar workers may also be exposed to hazardous fumes and substances such as asbestos that could increase the risk of developing lung cancer through this dangerous exposure. Income can restrict access to some health services, especially some specialists, surgeries and diagnostic screening including MRIs. People with a lower socioeconomic status have higher rates of cancer and higher mortality rates for cancer when compared to other Australians. This is due to the decreased access to health services, limited options for food and physical activity, and decreased awareness of risk and protective behaviours that may result.

Question 25
Distinguish between anxiety and arousal.

Criteria	Marks
• Notes clear differences between anxiety and arousal in terms of performance • Provides relevant examples	3
• Sketches in general terms some differences between anxiety and arousal • Includes examples	2
• Provides some relevant information about anxiety AND/OR arousal AND/OR performance	1

Sample answer
Anxiety is a psychological process characterised by fear or apprehension in anticipation of confronting a situation perceived to be potentially threatening. It generates a 'fight or flight' response and anxiety can be either state (related to a specific event like a sporting competition) or trait (a behavioural or personality disposition). It usually has a negative impact on sport and performance which can diminish because of the perceived threat. For example, a footballer suffering from anxiety leading up to their grand final may be unable to perform the required sporting skills like catching the ball from kick off and receiving a pass from their teammate.

In contrast, arousal is a physiological response to a specific moment or event and is usually represented by the inverted u hypothesis that shows arousal can either have a positive or negative impact on sporting performance depending upon the desired level of arousal required for a particular event for example, golf requires a lower level of arousal than a rugby league game.

Question 26
How can progressive overload and specificity be applied to strength training?

Criteria	Marks
• Relates how progressive overload and specificity can be applied to strength training • Provides a range of relevant examples	4
• Provides characteristics and features of how progressive overload and specificity can be applied to strength training • Provides examples	2-3
• Provides some relevant information about principles of training AND/OR strength training	1

Sample answer
There are six principles of training that can be applied to different training types. These include progressive overload and specificity.

Progressive overload describes a training effect that is produced when the system or tissue is worked at a greater level than it is normally accustomed to working at. As the body adapts to these new levels, training should continue to be progressively increased. Overload in strength training can be achieved by varying the frequency, duration and intensity (load) of the resistance training, with increases in intensity having the greatest effect. An athlete may gradually increase the load used when completing their resistance training program when using pin loaded weight machines at the gym. This increase may be an increase of 5kg every 2 weeks when training 4 times per week. Considerable stress must be placed on the system or tissue so that improvements can occur. If there is too much overload, fatigue can result as well as potential injury; if the training load is too little, the training effect will plateau or decrease.

Specificity is where the exercise must be specific to the type of strength required and is therefore related to the athlete's event/sport. The athlete should have knowledge of the predominant types of muscle activity associated with their event, the movement patterns involved, and the type of strength required. It may be more appropriate for the athlete to use elastics for ROM activities to best simulate the movement actions required, for example, when bowling in cricket.

Question 27
Discuss the use of supplementation in an athlete's diet.

Criteria	Marks
• Accurately identifies the issues associated with the use of supplementation in an athlete's diet • Provides a detailed discussion of the points for and against the use of supplementation in an athlete's diet • Provides relevant examples	5
• Identifies the issues associated with the use of supplementation in an athlete's diet • Provides a discussion of the points for AND/OR against the use of supplementation in an athlete's diet • Provides examples	3-4
• Sketches in general terms the use of supplementation in an athlete's diet	2
• Provides some relevant information on supplementation	1

Sample answer
Dietary supplements act to supply nutrients to individuals that are missing or not consumed in sufficient quantities in people's diets. Athletes commonly supplement their diet with protein, vitamins and minerals and creatine.

Protein and amino acids are essential components of an athlete's diet, with protein required for muscle recovery and development. Many athletes take protein supplements in the form of powdered protein before and after a training session. Many protein supplements have approx. 30g of protein per serve. The RDI for protein intake is 46g/day for females and 64g/day for males. Athletes require a greater amount of protein than the average sedentary adult, however, they also generally consume a greater amount of food than the average adult. Most protein supplements are expensive, so for many who consume a balanced diet it is money wasted.

Vitamins and minerals are micronutrients that are required in small amounts by the body. A varied diet that contains fruit, vegetables and dairy products usually supplies the body with the adequate quantities of essential vitamins and minerals. Many athletes, however, feel it is necessary to supplement their diet with multivitamins and mineral tablets. Vitamin and mineral deficiencies can have serious consequences such as anaemia if iron deficient, however, vitamins and minerals consumed in excess can have toxic effects. Vitamin A toxicity can cause fatigue, headaches and weight loss. While the supplementation of calcium and iron in some female athletes and some vitamins and minerals in other athletes is sometimes recommended, much of the time vitamins and minerals consumed are excreted as waste from the body as sufficient quantities are obtained from the diet.

Creatine usually occurs naturally in the body and is responsible for supplying a short burst of energy to muscles. Many athletes, particularly weightlifters and body builders, take creatine supplements to increase the availability of creatine to produce ATP in muscle cells. Creatine use can cause water retention, which is detrimental to athletes who compete in power to weight competitions, and overuse can cause liver and kidney dysfunction. Creatine is, however, useful for developed athletes undertaking resistance training to increase lean body mass and athletes that partake in interval or sprint training sessions.

Question 28

Analyse the physiological adaptations that occur during a 6-week aerobic training program for an untrained athlete.

Criteria	Marks
• Provides an extensive analysis of the physiological adaptations that occur in response to aerobic training • Provides relevant examples • Presents ideas in a clear and logical way	8
• Provides a sound analysis of the physiological adaptations that occur in response to one type of aerobic training • Provides examples	6-7
• Demonstrates some understanding of the physiological adaptations that occur in response to aerobic exercise • Provides limited examples	4-5
• Sketches in general terms the physiological adaptations AND/OR aerobic training	2-3
• Provides some relevant information about physiological adaptations and/or aerobic training	1

Sample answer

An athlete's body responds with physiological adaptations to training. This is a result of the body adjusting to the level of stress placed on it. It takes approx. 12 weeks for all the adaptations to the resting heart rate, stroke volume and cardiac output, oxygen uptake and lung capacity, haemoglobin levels, muscle hypertrophy, and the effect on fast and slow twitch muscles to improve performance.

After 6 weeks, the athlete's resting heart rate will decrease because of progressive aerobic training. This is a measurement of heart beats per minute (bpm), when the body is at rest. The more trained an athlete is, the lower their resting heart rate. Therefore, for this untrained athlete it will decrease but not as much as a trained athlete. RHR is a direct result of the cardiovascular system's efficiency; for instance, an inactive person's RHR is about 72 bpm, whereas an elite athlete can have 40 bpm at rest.

Another long-term adaptation to aerobic training is an increase in stroke volume; this is the blood pumped out of the left ventricle during each contraction and is measured by millilitres per beat. This adaptation allows for greater blood circulation during diastole (relaxation), meaning more oxygen is being transported around the body, making the aerobic system more efficient, thus improving performance. Moreover, aerobic training increases cardiac output, which is calculated by multiplying heart rate (HR) with stroke volume (SV). It is the total volume of blood pumped by the heart per minute and is a good indicator of aerobic training. Trained athletes usually have 25-40 litres per minute, while for untrained athletes; this is closer to 15-20 litres per minute.

Aerobic training significantly improves the muscles ability to utilise oxygen being delivered to it. Oxygen uptake of muscles is assessed in VO_2 max, and it is considered the most accurate measure of cardiorespiratory endurance. A high VO_2 max denotes a highly efficient system of oxygen delivery to muscles, which significantly enhances performance. An individual's lung capacity is usually not altered with aerobic training but remains a

significant factor in supplying enough energy to support the cardiovascular system. There is a slight increase in vital capacity (air expelled after max respiration), and a small decrease in residual volume (amount of air that must always be present in the lungs). Tidal volume increases during max effort exercise where the individual breathes in and out more oxygen.

Haemoglobin levels of athletes tend to increase with sustained aerobic over time. Haemoglobin transports oxygen in the blood and delivers it to the body's muscles; thus, an increase in haemoglobin levels allows for a greater volume of oxygen to be delivered around the body. The most effective way to increase haemoglobin levels is with altitude training. Training affects slow twitch muscle fibres. Aerobic training is the most beneficial to improve the effectiveness of slow muscle fibres. It increases hypertrophy, capillary supply, mitochondrial function, myoglobin content and oxidative enzymes.

Section II

Question 31(a)
Explain the processes the body uses to regulate its temperature during physical activity.

Criteria	Marks
• Makes the relationship clearly evident of the strategies the athlete uses to support the body's temperature mechanisms during physical activity. • Presents ideas in a clear and logical way • Illustrates answers with relevant examples	8
• Provides the characteristics and features of the strategies the athlete uses to support the body's temperature mechanisms during physical activity • Illustrates answers with examples	6-7
• Provides the characteristics and features of the strategies the athlete uses to support the body's temperature mechanisms during physical activity	4-5
• Sketches in general terms the strategies the athlete uses to support the body's temperature mechanisms during physical activity	2-3
• Provides some relevant information about the strategies AND/OR thermoregulation	1

Sample answer
To maintain the core body temperature at 37 degrees, there are a number of natural processes, which are evident. When an athlete participates in physical activity, they must have knowledge of how they can maintain thermoregulation.

Convection occurs when fluid (air or water) passes over the skin and draws heat away from the body. To enhance this on hot days, the athlete should aim to wear loose clothing and ensure adequate airflow indoors. To minimise this on cold and windy days, the athlete should wear tight clothing that covers the body (for example, arm warmers for cyclists) to reduce the body heat lost.

Radiation occurs when the heat is naturally released to the outside environment, or when the body heats up on very hot days. In hot temperatures, the athlete should try to wear loose and light-coloured clothing that reflects the sun's rays and prevents heat from being trapped near the skin.

Conduction occurs when heat is transferred from the skin to an object it is in contact with. This has less relevance for an athlete participating in physical activity but is evident when the athlete is holding onto an implement (for example, tennis racquet, cricket bat) or coming into contact with an object (when a cyclist sits on the seat). This means that body heat is lost and must be monitored.

Evaporation occurs when warm moisture on the skin converts from a liquid to a gas and is released into the atmosphere. This can have a cooling effect and is the body's greatest means of dispersing excessive heat. To enhance this, the athlete should try to wear breathable fabrics that wick the moisture away from the skin, however, this is made more difficult when the

humidity is high, as the air is already saturated. Adequate intake of water is necessary to prevent dehydration and hyperthermia.

Therefore, the athlete has many strategies that they can employ to ensure body temperature regulation when participating in physical activity.

Question 31 (b)

An athlete suffers a hamstring injury. Analyse the procedures required to successfully rehabilitate this injury.

Criteria	Marks
• Draw out and relate implications of the procedures required to successfully rehabilitate a hamstring injury • Makes clear links between a hamstring injury and successful rehabilitation • Presents ideas in a clear and logical way • Illustrates answers with relevant examples	11-12
• Draw out and relate implications of the procedures required to successfully rehabilitate a hamstring injury • Illustrates answers with examples	8-10
• Provides the characteristics and features of the procedures required to successfully rehabilitate a hamstring injury • Provides limited examples	5-7
• Sketches in general terms the ways procedures required to successfully rehabilitate a hamstring injury	3-4
• Provides some relevant information about the procedures required to successfully rehabilitate a hamstring injury	1-2

Sample answer
Following a hamstring injury there are many procedures that the athlete must follow during their rehabilitation procedures. This is after assessment and management of the injury to assist the athlete to be able to return to play as soon as possible.

Rehabilitation procedures are the procedures used by sports physiotherapists and exercise physiologists in the care and management of sports injuries. **Progressive mobilisation** is the gradual increase in pain free joint range of motion, while **graduated exercise**, refers to the gradual increase in exercise intensity and the forces going through the injury area. During rehabilitation, procedures help to ensure the athlete does not lose all fitness via the reversibility effect. Instead, some form of **training** will still be prescribed and monitored if possible. The procedures for rehabilitation will also **use heat and cold** in the treatment of the injury. Heat is used to increase flood flow and elasticity of the joint, while cold is used to decrease blood flow and inflammation around the injury.

There should be no stretching of the hamstring during the initial acute period of injury. This will allow the injury to begin to heal before it is pulled at, which will cause further injury. Once a professional has declared this to be over, stretching becomes the first rehabilitation procedure for a hamstring tear. Stretching should begin using isometric stretching, where the hamstring is stretched with no pain. The muscle should just begin to stretch and then it should be held there, not taken further. Adjustments to the stretch, such as straight legged, then bent leg, should be used to target each hamstring individually. Stretching can then progress to PNF and dynamic stretches as functional capacity begins to return to the leg. Stretching will help to increase and restore the range of motion/movement at the knee and hip as the hamstring goes across both joints.

Conditioning is another aspect of the rehabilitation procedures for a hamstring tear. General strengthening exercises should be pain free. The athlete should begin with isometric contractions of the hamstring that are a low intensity to begin with. Isometric exercises should be conducted throughout the pain free range of movement. Conditioning exercises will then progress through a range of dynamic activities as recovery continues. Movements will then become functional, before sport specific exercises are given. During these exercises, it is important to minimise pain, and often cold therapy is used if pain occurs.

After the acute phase of injury, stationary equipment is used to maintain and/or enhance total body fitness. Arm ergometers can be used to help maintain cardiovascular fitness, but also rowing machines and cross trainers can be used, as long as the intensity keeps the hamstring pain free. From these low impact machines, the athlete will progress to light jogging and before agility runs. Finally, the athlete will progress to full sprints.

One of the final rehabilitation procedures for a hamstring tear is training. Once the athlete has been given the clear from a professional, they may return to training. It will take a while for the muscular endurance and power produced by the hamstring to return. The athlete will also become more confident to use the hamstring to their full potential through training drills.

The use of heat and cold as a rehabilitation procedure for a hamstring tear is used throughout the recovery process. Cold therapy is used when pain occurs, especially during the acute phase of injury, or after rehabilitation exercises. Heat is not used in the acute phase, but may be used to enhance blood flow to the hamstring before stretching or rehabilitation exercises in order to increase flexibility, and to provide blood flow to the area in order to speed up the healing process.

The use of these rehabilitation procedures for a hamstring tear will help provide a speedy recovery, while maintaining athlete safety and reducing the chance of re-injury.

Question 32 (a)
Evaluate safe and potentially harmful training procedures for TWO types of training.

Criteria	Marks
• Makes a judgement regarding safe and potentially harmful procedures for TWO types of training • Provides accurate and relevant examples	8
• Provides characteristics and features of both safe and potentially harmful training procedures related to TWO training types • Shows some link between training procedures and their outcomes • Provides example/s	6-7
• Describes features regarding safe and potentially harmful procedures for two types of training • May provide examples	4-5
• Sketches in general terms safe and/or potentially harmful procedures for types of training	2-3
• Identifies information on safe/harmful training practices OR training types	1

Sample answer
There are many safe and many potentially harmful training procedures related to the various training types. Strength training exposes athletes to a high risk of injury when executing training if certain procedures are not followed. Participants should be aware of all safety precautions and potential harm from procedures before they commence a training program as incorrect forms and/or procedures will result in injury.

It is essential that an athlete uses only safe and well-maintained equipment as damaged or poorly-maintained equipment can result in injury. Precede specific strength-training programs with a general program to ensure that all required muscles are adequately developed and resistant to injury. Warm up prior to all strength-training sessions to reduce the chance of muscle strains or tears. Athletes must also use weights, sets and reps that are indicative of a person at their stage or development. Using weight that is too heavy will result in injury with possible long recovery periods. These measures are essential in ensuring safe participation in strength training.

Another essential safety procedure is the use of spotters to ensure that technique is maintained, which will reduce cheat reps and exposure to injury. With the use of a spotter, an athlete can ensure controlled execution of movement and avoid the jerky contracts that result in muscle injuries. Ensure exercises are equally balanced to avoid an imbalance in muscle hypertrophy, resulting in such conditions as kyphosis (rounded shoulders due to an imbalance of the chest and back muscles).

To avoid injuries an athlete must ensure that they progressively overload in small increments to ensure that the body has the required time to adapt. This will avoid injury in joints and muscles and prevent long periods of recovery. To effectively and safely participate in strength training, an athlete must ensure that they adequately cool down and allow appropriate rest days to allow muscle recovery and prevent injuries from fatigue.

Although the level of intensity is not high in flexibility training, it essential that an athlete does not push themselves to a point that it causes injury. The principle of progressive overload should be applied to flexibility training. To ensure the athlete does not sustain an injury during flexibility training they would always warm up adequately before commencing training and only elite athletes would engage in ballistic movements.

Question 32 (b)
Analyse how the elements of a training session could be modified to meet the ability of the athlete

Criteria	Marks
• Identifies the elements of a training session • Draws out and relates implications of how these elements can be modified to match the abilities of athletes • Presents ideas in a clear and logical way • Illustrates answers with relevant examples	11-12
• Identifies the elements of a training session • Attempts to draw out and relates implications of how these elements can be modified to match the abilities of athletes • Illustrates answers with examples	8-10
• Provides characteristics and features of some elements of a training session and refers to the abilities of athletes	5-7
• Sketches in general terms some of the elements of a training session and/or refers to the abilities of athletes	3-4
• Provides some relevant information about elements of a training session OR matching the abilities of athletes	1-2

Sample answer
There are many elements to be considered when designing a training session. These include safety, including the safety of the equipment, facilities and training being designed to meet the levels of the athlete/s. Other elements to be considered when designing a training session include how much time will be allocated to each activity, what the goals or aims of the session will be, how warm up and cool down will be done and making sure you leave room at the end to evaluate the session. The timing of the elements is also important to consider, for example, warming up, conditioning work, or skill development and the order that these will be done in order to gain the most from the training session.

Health and safety considerations – These include safe environment for example, playing surfaces, well-maintained equipment and facilities, adequate drink and rest breaks and consideration for weather/climatic conditions. Young athletes are more susceptible to injury and overtraining, therefore it is essential a coach monitors their wellbeing for example, avoid training sessions during excessively hot and humid conditions, monitor dangerous behaviours that may result in injury by providing them with regular drink breaks and rest sessions depending upon the age and skill of the individual athletes.

Providing an overview of the session – A brief explanation, usually by the coach, of the objectives and goals for a session will help athletes to psychologically prepare for training. In explaining the focus of the session, coaches of elite athletes will often review previous games and/or training sessions identifying elements that need to be improved. Clear expectations and goals are set at this time, this will maximise the effectiveness of a session.

Warm up and cool down – The warmup physically and mentally prepares the body for training. Usually involves low intensity aerobic activity, followed by stretching and then higher intensity activity, drills and skills. Cool down restores body back to pre-training levels, aids with recovery and removal of waste products. For junior athletes, both the warm-up and

cool down will be structured activities, often lead by the coach. The importance of these elements should be regularly reinforced for junior athletes and coaches should educate players on the correct procedures and techniques. Elite level athletes need less input from a coach and are often capable of performing their own warm up, cool down routines.

Skill instruction and practice – New skills and drills are best included after the warmup, before athletes are fatigued. Junior athletes will spend considerable time learning and practising new skills, eg the coach of a young soccer team will modify training to include drills and games to develop the skills of passing, kicking and dribbling etc. Generally, high-level soccer players have well developed skills and therefore spend time practising in game like situations and working on decision making, team strategies and tactics.

Conditioning – Includes the development of fitness components necessary for success in the specific sport for example, speed, strength, endurance, power etc. Generally, the conditioning element is most important during the pre-season and it forms a significant part of training sessions for elite athletes who require high levels of fitness for success. Conversely, junior sport has more of a focus on participation, skill development and enjoyment.

Evaluation – This often occurs during or immediately after the session, providing the coach and players the opportunity to provide feedback and reflect on the effectiveness of the session. At the junior level, an evaluation may be quite brief, with the coach asking players to think about what they learnt during the session and reminding them about the time and location of the weekend game. At the elite level, the evaluation will likely be more in depth, with coaches providing athletes with detailed information about individual performance. Furthermore, high level coaches may want to discuss strategies and tactics to be used in the coming competition.

2020 Higher School Certificate
Trial Examination
Personal Development, Health and Physical Education
Mapping Grid

Section I
Part A

Question	Marks	Content	Syllabus Outcomes
1	1	Cardiovascular disease – nature	H1
2	1	Aerobic training	H8
3	1	Measures of epidemiology	H2
4	1	Flexibility training	H10
5	1	Costs to the community	H15
6	1	Energy systems	H7
7	1	Social justice principles	H15
8	1	Motivation	H11
9	1	Medicare	H5
10	1	Validity of tests	H9
11	1	Responsibility for health facilities and services	H5
12	1	Characteristics of a skilled performer	H9
13	1	Impact of emerging new treatments and technologies on health care	H14
14	1	Psychological strategies	H11
15	1	Measures of epidemiology	H2
16	1	Recovery strategies	H8
17	1	Epidemiology	H1
18	1	Stages of skill acquisition	H9
19	1	Private health insurance	H5
20	1	The performance elements	H8

Section I
Part B

Question	Marks	Content	Syllabus Outcomes
21	3	The Ottawa Charter in action	H4
22	4	A growing and ageing population	H15
23	5	Measuring health status	H2
24	8	Cancer – socioeconomic determinants	H3
25	3	Anxiety and arousal	H11
26	4	Principles of training / Strength training	H10
27	5	Supplementation	H11
28	8	Physiological adaptations	H7

Section II

Question	Marks	Content	Syllabus Outcomes
31 (a)	8	Environmental considerations – temperature regulation	H17
31 (b)	12	Rehabilitation procedures	H13
32 (a)	8	Types of training	H8
32 (b)	12	Elements to be considered when designing a training session	H10