SHORE

Sydney Church of England Grammar School

Student Number:

2016

HIGHER SCHOOL CERTIFICATE

TRIAL EXAMINATION

Personal Development, Health and Physical Education

General Instructions

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

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

DO NOT REMOVE THIS PAPER FROM THE EXAM ROOM

Total marks – 100

Section I Pages 1 - 14

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 part

Part B – 40 marks

- Attempt Questions 21–27
- Allow about 1 hour and 10 minutes for this part

Section II Pages 15-16

40 marks

- Attempt TWO questions from Questions 28–32
- Allow about 1 hour and 10 minutes for Section II

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 most commonly used measure to describe the health of a population?

(A) Mortality

(B) Morbidity

(C) Infant mortality

(D) Life expectancy

2. Which of the following statements defines state anxiety?

(A) Use of senses to perceive surroundings

(B) An athlete's emotional response to a particular situation

(C) An athlete's predisposition to perceive a situation in a particular manner

(D) Physiological and psychological activation that produces readiness to perform

3. Which nutrient is only broken down to produce ATP in extreme conditions?

(A) Protein

(B) Minerals

(C) Carbohydrate

(D) Triglycerides

Question 4 relates to the table below

Energy System	Efficiency of ATP Production	Cause of Fatigue
Aerobic	Slow but unlimited	X
Lactic acid	Rapid but limited	Y
Alactacid	Rapid but limited	Z

4. What is the cause of fatigue represented by the letter Z?

(A) Depletion of PC

(B) Accumulation of ATP

(C) Depletion of Glycogen

(D) Accumulation of Lactic acid

5. *An athlete learning a new motor skill is displaying the following characteristics;*

- *a sense of fluency is being developed*
- *small errors occur infrequently*
- *confidence increases.*

What stage of skill acquisition is this describing?

(A) Autonomous

(B) Associative

(C) Cognitive

(D) Planning

6. Which of the following provides the most funding for public hospitals in Australia?

(A) Local Government

(B) State Government

(C) Federal Government

(D) Non-government organisations

7. Which of the following is an example of a neural recovery strategy?

(A) Relaxation methods

(B) A cool down program

(C) Contrast water therapy

(D) Ice as a form of cryotherapy

8. Which of the following is an example of a specialist medical service?

(A) Community health centre

(B) Orthopaedic Surgeon

(C) General Practitioner

(D) Theatre nurse

9. What ways can observations of performance be made more objective?

(A) Checklists and personal judging criteria.

(B) Checklists, rating scales and established criteria

(C) Knowledge of results and knowledge of performance

(D) Measuring systems, the judge's opinion and video analysis

10. Which of the following identifies the impact of new treatments and technologies on health care?

(A) Reduced costs for expenditure on illnesses and an increase in chronic diseases

(B) Fewer people will be bulk billed for their medical services as the cost of technology rises

(C) Increased expenditure on new technology and improved ability to detect and treat illness

(D) Improved technology will lead to an aging population and longer stays in hospital for patients

11. *Aboriginal and Torres Strait Islander people have lower levels of income to Non-Indigenous Australians.*

Which determinant does this represent?

(A) Socioeconomic determinant

(B) Sociocultural determinant

(C) Environment determinant

(D) Social justice principles

12. *An athlete has reported to their coach that they are experiencing anxiety prior to performance.*

Which of the following strategies would be appropriate to incorporate to assist management of their anxiety?

(A) Focusing, relaxation techniques, imagery

(B) Mental rehearsal, focusing, neural strategies

(C) Supplementation, imagery, relaxation techniques

(D) Mental rehearsal, neural strategies, supplementation

13. Which of the following provides an example of the action area '*Developing Personal Skills"*?

(A) Increasing taxes on cigarettes to encourage people to quit smoking

(B) Employing translators in hospitals for people who are born overseas

(C) Improving the literacy and numeracy rates in indigenous communities

(D) Providing blue collar workers with sun safe personal protection equipment

14. Which of the following reflects the focus of strategic and tactical development when preparing for performance?

(A) The gene-centred approach

(B) Massed and distributed practice

(C) Space, force, direction and other players.

(D) Observation, question and whole-part-whole approach

15. Why is it important to prioritise health issues?

(A) To identify equity gaps within the Australian population where access to resources are limited

(B) To increase Government expenditure on resources to support people living with chronic health conditions

(C) To decrease Government benefits which support people to maintain their health as they age

(D) To identify how to allocate resources based on prevalence of conditions and the potential for prevention

16. What heredity characteristics influence skill acquisition and performance?

(A) Conceptual ability, somatotype and gender

(B) Personality, confidence and prior experience

(C) Enthusiasm, willingness to learn and gender

(D) The percentage of fast-twitch to slow-twitch muscle fibres and self-confidence

17. Which of the following statements defines the term ‘advocacy’?

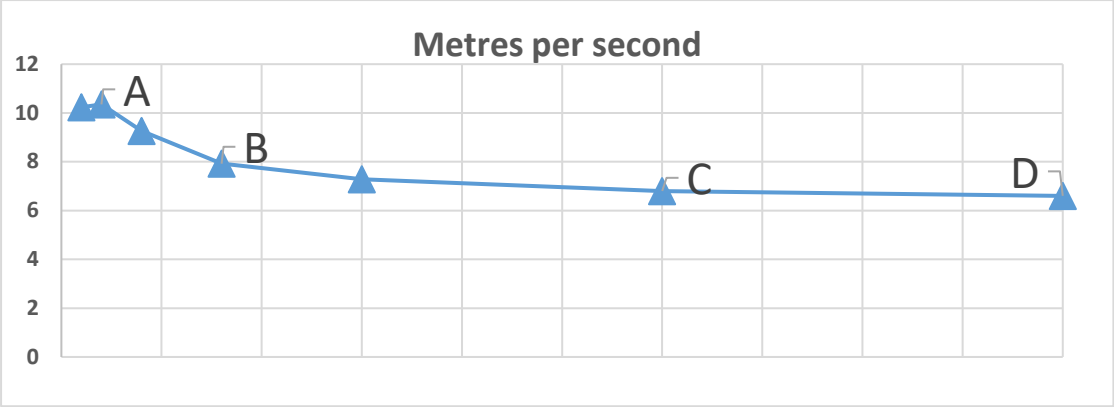
(A) Allowing all people to take control of their own decisions for health

(B) Providing to all people the fundamental conditions and resources for health

(C) Speaking up for people who do not have a strong voice within the community

(D) Working to provide common goals and directions for different sections of the society

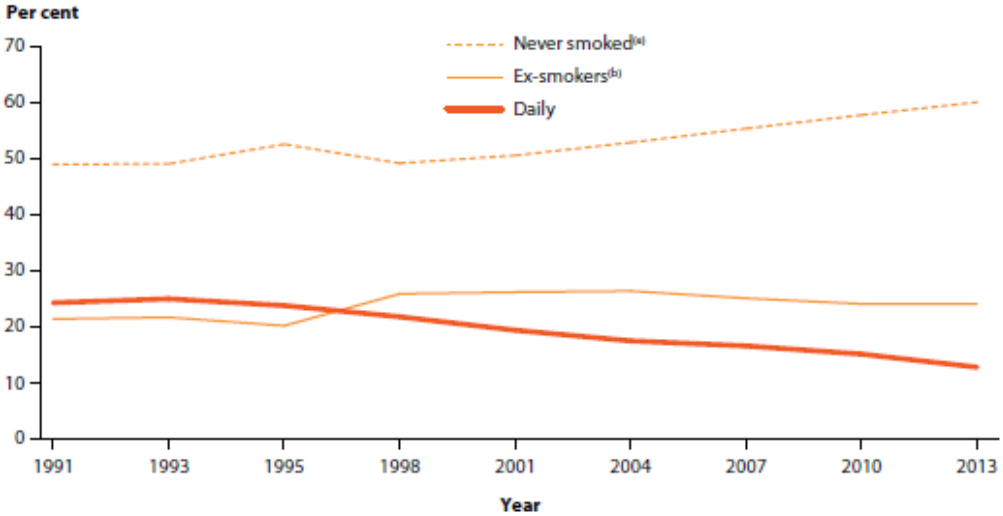
18. *The graph below shows the world record running speeds for a variety of races.*



What type of training would be specific for the runner at B?

(A) 50 – 100 metre intervals to improve leg speed
(B) Circuit training to improve whole body strength
(C) Continuous training including running and swimming
(D) 600 – 800 metre intervals to improve tolerance to lactic acid

19. *The graph below represents smoking rates in Australia.*

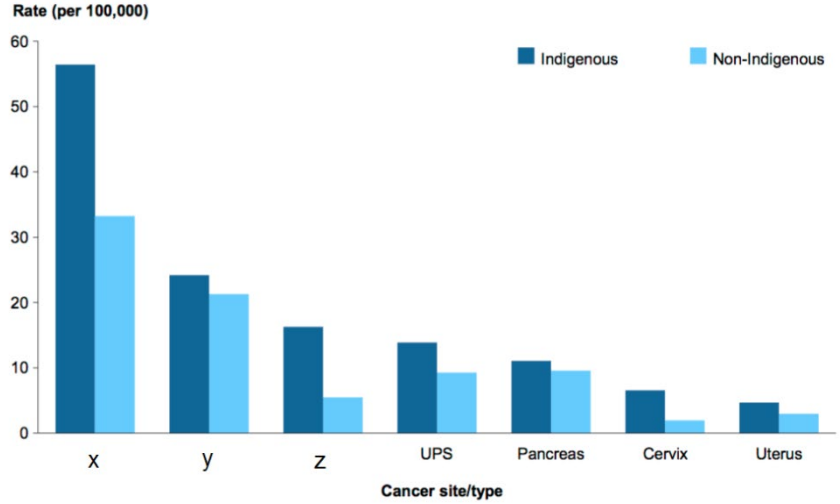


Source: www.aihw.gov.au

Which combination of action areas of the Ottawa Charter has had the biggest effect on smoking rates in Australia?

(A) Building Healthy Public Policy & Strengthening Community Action
(B) Strengthening Community Action & Reorienting Health Services
(C) Building Healthy Public Policy & Developing Personal Skills
(D) Reorienting Health Services & Developing Personal Skills

20. The graph represents the mortality rates for specific cancers for Indigenous and Non-Indigenous Australians in 2014.



Source: Cancer in Australian: an overview 2014

What type of cancer is represented by *X, Y & Z* respectively?

(A) Prostate, breast, lung

(B) Liver, lung, prostate

(C) Breast, lung, colon

(D) Lung, breast, liver

Section I continues over the page

Part B – 40 marks
Attempt Questions 21 – 27

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

Question 21a **Marks 2**

What are the groups at risk of cardiovascular disease?

Question 21b **5**

How can individuals reduce the risk factors and increase the protective factors for cardiovascular disease?

Question 22 **5**

Describe the role of governments in addressing the health inequalities of Aboriginal and Torres Strait Islander Peoples.

Question 23 **8**

Analyse the reasons for the growth of complementary and alternative health products and services.

Question 24 **3**

Identify a reason for and against the use of caffeine and creatine products as dietary supplements for improved performance by completing the table below.

	Caffeine	**Creatine products**
Reason for use	_____ _____ _____ _____	_____ _____ _____ _____
Reason against use	_____ _____ _____ _____	_____ _____ _____ _____

Question 25 **4**

Outline the characteristics of a skilled performer.

Question 26 **5**

Why are pre-performance nutritional considerations different for an endurance athlete to that of a non-endurance athlete? Use examples to support your answer.

Question 27 **8**

What is the effect of the application of the principles of training on the physiological adaptations to training?

Section I Part B extra writing space
If you use this space, clearly indicate which question you are answering.

End of section I

Section II

40 marks

Attempt TWO questions from Questions 28 – 32
Allow about 1 hour and 10 minutes for this section

Answer each question in a SEPARATE writing booklet. Extra writing booklets are available

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In your answer 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

Marks

Question 28 – The Health of Young People (20 marks)

a) Explain the patterns of morbidity and mortality of young people. **8**

b) To what extent do sociocultural, socioeconomic and environment determinants impact on two major health issues affecting young people? **12**

Question 29 – Sport and Physical Activity in Australian Society (20 marks)

a) Explain the meaning of traditional activities and sports to Indigenous Australians. **8**

b) To what extent does coverage given to a particular sport reflect which sports are valued and which ones are not. **12**

Please turn over

In your answer 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 30 – Sports Medicine (20 marks)

a) Explain the management procedures for soft tissue injuries. **8**

b) Analyse the role that sports medicine plays in addressing the needs of female athletes. **12**

Question 31 – Improving Performance (20 marks)

a) Using an athlete in a specific sport, analyse TWO training types that could improve their performance. **8**

b) Justify how each of the periodisation phases is used when planning a training year. **12**

Question 32 – Equity and Health (20 marks)

a) Explain the actions that improve health in groups experiencing inequities. **8**

b) To what extent does the exposure to multiple factors contribute to health inequities? **12**

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End of paper

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SHORE HSC TRIAL EXAMINATION 2016

Personal Development, Health and Physical Education - Mapping Grid

Question	Mark	Content	Outcome	Band
1	1	Measuring health status	H2	2-3
2	1	Anxiety and arousal	H11	2-3
3	1	Nutritional considerations	H11	2-3
4	1	Energy systems	H7	3-5
5	1	Stages of skill acquisition	H9	3-5
6	1	Responsibility for health facilities and services	H5	3-5
7	1	Recovery strategies	H8	3-5
8	1	Range and types of health facilities and services	H5	3-5
9	1	Objective and subjective performance measures	H9	3-5
10	1	Impact of emerging new treatments and technologies on health care	H3	3-5
11	1	Groups experiencing health inequities	H3	3-5
12	1	Psychological strategies to enhance motivation and manage anxiety	H11	3-5
13	1	The Ottawa Charter in action	H4	3-5
14	1	The learning environment	H8, H10	3-5
15	1	Identifying priority health issues	H1	3-5
16	1	Characteristics of the learner	H7, H17	3-5
17	1	Health promotion based on the five action areas of the Ottawa Charter	H4, H5	3-5
18	1	Energy systems	H7, H16	5-6
19	1	The Ottawa Charter in action	H4, H15	5-6
20	1	High levels of preventable chronic disease, injury and mental health problems	H2, H16	5-6
21a	2	Cardiovascular disease (CVD) – groups at risk	H2	2-3
21b	5	Cardiovascular disease (CVD) – risk factors and protective factors	H1, H14	3-5

22	5	Groups experiencing health inequities	H5, H14, H15	3-5
23	8	Complementary and alternate health care approaches	H3, H15	5-6
24	3	Supplementation	H11	2-3
25	4	Characteristics of a skilled performer	H9	3-5
26	5	Nutritional considerations	H11	3-5
27	8	Principles of training / physiological adaptations to training	H7, H17	5-6
30a	8	Soft tissue injuries	H8, H13	3-5
30b	12	Female athletes	H8, H13	5-6
31a	8	Training types	H8, H10, H17	3-5
31b	12	Planning a training year (periodisation)	H7, H8, H9, H16	5-6

SHORE HSC TRIAL EXAMINATION 2016

SUGGESTED ANSWERS AND MARKING CRITERIA

Section 1 – Part A

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

Core 1 – Health priorities in Australia

Question 21 a)
What are the groups at risk of Cardiovascular Disease?

Criteria	Marks
• Identifies a range of groups at risk of Cardiovascular Disease	**2**
• Identifies some groups of risk of Cardiovascular disease	**1**

Students learn about

- high levels of preventable chronic disease, injury and mental health problems
  - cardiovascular disease (CVD)
  - cancer (skin, breast, lung)
  - diabetes
  - respiratory disease
  - injury
  - mental health problems and illnesses

Students learn to

- research and analyse CVD, cancer and ONE other condition listed by investigating:
  - the nature of the problem
  - extent of the problem (trends)
  - risk factors and protective factors
  - the sociocultural, socioeconomic and environmental determinants
  - groups at risk

Answers could include but not be limited to:
ATSI peoples, Low SES, Family history of CVD, Smokers, People with high blood pressure, People who are overweight, People aged over 65.

Sample answer
Smokers are at risk as the nicotine and chemicals places pressure of the heart and arteries. People with a family history are more likely to have a genetic weakness in their heart. People aged over 65 as their CVD system begins to deteriorate. ATSI Peoples have many combined risk factors. Low SES many not be able to get regular medical checks.

Question 21 b)
How can individuals reduce the risk factors and increase the protective factors for Cardiovascular Disease?

Criteria	Marks
• Makes evident the steps individuals can take to reduce the risk factors and increase the protective factors for Cardiovascular Disease. • Provides a range of examples.	**5**
• Outlines the steps individuals can take to reduce the risk factors and increase the protective factors for Cardiovascular Disease. • Provides some relevant examples	**3 – 4**
• Provides some relevant information about the way to reduce the risk factors and increase the protective factors for Cardiovascular Disease	**1 – 2**

Answers could include but not be limited to:

- Risk factors such as smoking, high levels of cholesterol, obesity, or being overweight, physical inactivity, advancing age, heredity factors, gender.
- Protective factors such as exercise, a low fat diet, stop smoking, regular health checks

Sample answer
One way a person can reduce the risk associated with CVD is through stopping smoking. Cigarettes are one of the biggest factors in the development of CVD and by stopping this risk factor is reduced. Not smoking at all is an important protective factor.

Obesity is another major risk factor and it is closely associated with poor diet (high in fat) and low levels of exercise. As a person puts on weight the number of blood vessels is increased and this places more of a burden on the heart. People who are obese are more likely to have high fat diets which increases the level of atherosclerosis in the arteries. Maintaining a healthy weight and eating a low fat diet provides protection from CVD.

A lack of exercise means that the heart is not given the opportunity to get stronger. Weight gain can also occur. A sensible exercise program provides some protection against CVD.

People with a family history of CVD, males and people over 65 are all at increased risk. If regular medical checks are undertaken this is a protective factor as any underlying issues can be addressed early and not become more problematic if left untreated.

Question 22
Describe the role of governments in addressing the health inequalities of Aboriginal and Torres Strait Peoples.

Criteria	Marks
• Provides the characteristics and features of the role of governments play in addressing the health inequalities of Aboriginal and Torres Strait Peoples. • Provides a range of relevant examples.	**5**
• Sketches in general terms the role of governments play in addressing the health inequalities of Aboriginal and Torres Strait Peoples. • Some examples used to illustrate their information.	**3 – 4**
• Provides some relevant information about the role of governments play in addressing the health inequalities of Aboriginal and Torres Strait Peoples.	**1 – 2**

Students learn about:

- groups experiencing health inequities
  - Aboriginal and Torres Strait Islander peoples
  - socioeconomically disadvantaged people
  - people in rural and remote areas
  - overseas-born people
  - the elderly
  - people with disabilities

Students learn to:

- research and analyse Aboriginal and Torres Strait Islander peoples and ONE other group experiencing health inequities by investigating:
  - the nature and extent of the health inequities
  - the sociocultural, socioeconomic and environmental determinants
  - the roles of individuals, communities and governments in addressing the health inequities

Answers could include but not be limited to:

- Local, State and Federal Government initiatives.
- Social policy, access to health care, welfare programs, housing, water, health promotion initiatives

Sample answer

There are many polices the federal government controls which affect the health of the ATSI community. One is the provision of employment related services such as unemployment benefits and work schemes. The lack of opportunities to work in rural and remote communities leads to low levels of self-worth and poor physical and mental health. Programs which act to improve knowledge and skills for work will improve health if employment occurs following this, reducing health inequities.

Federal governments also provide funding for medical services such as GPs. They have recently increased the opportunities for ATSI people to train as medical practitioners so that cultural appropriate treatment can be provided to the ATSI population. Additionally, the government have given extra incentives to GPs practice in remote areas so that there is increased access to medical services. In some rural areas free GP home visits to ensure that young children's health needs are identified as early as possible and treated promptly. Regular access to affordable health care will improve health for the ATSI community.

State governments are responsible for providing the infrastructure such as water, electricity and sewerage to all populations. These services help reduce diseases which result from poor hygiene. Remote ATSI communities do not have the same reliable infrastructure as people located in the city and funding for these basics will improve health. Housing is another state government responsibility. Having local communities build their own housing will provide work and skills for the community and reduce the effects of unemployment. The state government is also responsible for health promotion such as the latest ads targeting ATSI smokers, who have a smoking rate of twice that of the general population.

Local governments provide local programs and can support initiatives such as the banning of alcohol from local communities so that the rate of violence such as domestic violence can be reduced. Good quality roads also affect service delivery such as the delivery of fresh food and the ability of medical services. The maintenance of these is a local government responsibility.

Question 23
Analyse the reasons for the growth of complementary and alternative health products and services.

Criteria	Marks
• Demonstrates thorough knowledge of the reasons for growth of complementary and alternative health products and services • Draws out and relates the reasons for growth and specific complementary and alternative health products and services. • Provides a range of relevant examples.	**8**
• Explains the reasons for growth of complementary and alternative health products and services • Provides relevant examples	**6 – 7**
• Provides characteristics and features of the growth of complementary and alternative health products and services. • Provides some relevant examples.	**4 – 5**
• Sketches in general terms the reasons for growth of complementary and alternative health products and services • Provides a relevant example.	**2 – 3**
• Provides some relevant information about the growth of complementary and alternative health care approaches.	**1**

Students learn about

- complementary and alternative health care approaches
  - reasons for growth of complementary and alternative health products and services
  - range of products and services available
  - how to make informed consumer choices

Students learn to

- critically analyse complementary and alternative health care approaches by exploring questions such as:
  - how do you know who to believe?
  - what do you need to help you make informed decisions?

Answers could include but not be limited to:

- *Products and services*

Acupuncture, Aromatherapy, Chiropractic, Homeopathy, Naturopathy, Osteopathy

- *Reasons for growth*

Community acceptance, Effectiveness, Preventative in nature, Holistic in nature, Treating cause not illness, Recognition by private health insurance, Recognised training for practitioners.

Sample answer

One of the reasons for the growth in complementary and alternate medicines is that many are holistic in nature. This means that all aspects of the person are examined and treatment is designed to make changes so that the balance between emotional, physical and social health is developed. Naturopaths utilise massage, diet and herbal medicines to treat the whole person and this is attractive to people who want to make positive change in their life and is one reason why this type of health care is increasing.

As more research is undertaken into the types of treatment offered by alternate health care providers it can be seen that many of the treatments have been proven effective for individuals. Many individuals with chronic back pain have had more success with regular treatment by a chiropractor rather than orthodox treatment and this has led to more people trailing alternate therapies.

For many years alternate therapies were not recognised by private health insurance providers and as a result people could not afford to pay to see an alternative medicine practitioner. With the ability to claim a rebate for many services such as yoga classes and osteopathy more people can afford to try these and this has led to an increase in the number of people using this type of treatment.

As the industry has become more professional there have been improvements in the training which people undertake. Chiropractors study at university for a minimum of 4 years, there are recognised colleges for other therapies and there is a peak organisation for the services so that somebody can monitor the service providers. This improved accountability gives patients more confidence in the service providers and means that more people are willing to undertake treatment from them.

As a multicultural society, Australia's migrant population have brought some of their traditional treatments with them. As the population grows there is a natural growth in the use of alternate therapies as the children of these migrants continue with the traditional treatments. For example, the Chinese have been using acupuncture for many years and the effectiveness of this leads to more people undertaking this type of treatment.

Core 2 – Factors Affecting Performance

Question 24

Identify a reason for and against the use of caffeine and creatine products as dietary supplements for improved performance by completing the table below.

Criteria	Marks
• Identifies a valid reason for and against the use of both caffeine and creatine products	**3**
• Identifies a reason for and/or against the use of caffeine and creatine products	**2**
• Identifies a reason for or against the use of either caffeine or Creatine	**1**

Students learn about

- supplementation
  - vitamins/minerals
  - protein
  - caffeine
  - creatine products

Students learn to

- critically analyse the evidence for and against supplementation for improved performance

Answers could include, but not be limited to:

	Caffeine	***Creatine products***
Reasons for use	• *prolonged endurance exercise and short-term intense exercise lasting approx. 5 minutes* • *Ergogenic aid or 'glycogen sparing'* • *Improve perception of fatigue* • *Stimulant*	• *improves resynthesis of ATP and recovery of ATP stores.* • *assist muscle hypertrophy*
Reasons against use	• *Dehydration* • *Can cause anxiety in high doses*	• *muscle cramping* • *weight gain*

Question 25
Outline the characteristics of a skilled performer.

Criteria	Marks
• Sketched in general terms the characteristics of skilled performers • Provides relevant examples	4
• Sketches in general terms some characteristics of skilled performers • OR • Identifies the characteristics of skilled performers	2 - 3
• Provides some relevant information about skilled performers	1

Students learn about

- assessment of skill and performance
  - characteristics of skilled performers, eg kinaesthetic sense, anticipation, consistency, technique
  - objective and subjective performance measures
  - validity and reliability of tests
  - personal versus prescribed judging criteria

Students learn to

- develop and evaluate objective and subjective performance measures to appraise performance

Answer could include but not be limited to:

- Kinaesthetic sense – allows the athlete to 'feel' the movement as they perform it.
- Anticipation – skilled performers are better able to predict what may happen in specific situations.
- Consistency – skilled performers have much greater consistency, they are able to perform the desired movement repeatedly.
- Technique – the way a skill is performed.

Sample answer
Kinaesthetic sense is the ability to 'feel' the movement as the athlete performs it. Muscle memory is developed in skilled performers and as a result they are alert to movement errors and can make corrections and modify movement. For example, a basketballer while in the air is able to adapt to pressure, modify his technique and make the shot.

Anticipation is being able to predict what may happen in specific situations eg flight path of the ball, speed of the ball or direction of pass or opponent. This allows added time to respond and out-manoeuver an opponent, especially in team sports such as AFL, hockey and soccer.

Consistency is the ability to perform the desired movement repeatedly without error. For example, a skilled tennis player is more consistent in rallies, clearing the net and keeping the ball in play more regularly.

Technique is the procedure or practical method applied to performing a particular task. The more efficient the movement the better the performance as it is more economical (using less energy), aesthetically pleasing and it decreases the risk of injury. For example, a golfer is able to drive big distances, a cricketer gets more runs and a basketballer will shoot successfully.

Question 26
Why are pre-performance nutritional considerations different for an endurance athlete to that of a non-endurance athlete? Use examples to support your answer.

Criteria	Marks
• Provides clear reasons showing why pre performance nutritional considerations differ for endurance to non-endurance athletes • Communicates ideas and information using relevant examples	**5**
• Provides a reason for the difference in pre performance nutritional considerations for an endurance athlete to that non-endurance athlete • Communicates ideas and information using a relevant example	**3 – 4**
• Sketches in general terms nutritional considerations for an endurance athlete and/or non-endurance athlete	**2**
• Provides some information about pre performance nutritional considerations	**1**

Students learn about

- nutritional considerations
  - pre-performance, including carbohydrate loading
  - during performance
  - post-performance

Students learn to

- compare the dietary requirements of athletes in different sports considering pre-, during and post-performance needs

Answers could include but not be limited to:

- Nutritional considerations
  - Pre-performance, including carbohydrate loading
- Compare the dietary requirements of athletes in different sports considering pre, during and post-performance needs

Sample Answer
Pre-performance nutritional considerations differ for an endurance athlete to that of a non-endurance athlete primarily due to the duration of the event. An endurance event such as a marathon, triathlon or long distance cycling such as the Tour De France will take a longer period of time to complete than a non- endurance event such as a 100m sprint or 50m freestyle swim. An endurance athlete will therefore need more stored energy in the form of glycogen as they will utilise the aerobic energy system for fuel.

Ensuring that enough glycogen is available for energy is achieved by optimising carbohydrate intake pre event. Endurance athletes would benefit from carbohydrate loading to maximise muscle glycogen stores. Carbohydrate loading involves a high carbohydrate diet (increased pasta/rice/breads/cereals to 10-12 g of carbohydrate/ kilo of body weight) 3-4 days prior to competition along with an exercise taper. Extra stored carbohydrate will allow athletes to perform at optimal pace for longer periods of time which is needed due to the nature of endurance events. Some team sport athletes who partake in sports that last for a significant length of time such as AFL will also benefit from this nutritional technique. For events that are non-endurance based such as sprint /power event in athletics (shot put, 100m, long jump), adequate glycogen stores can be maintained by rest or light activity prior to competition (24-48 hrs) along with consumption of carbohydrate at 5-7g /1kilo of body mass. There is no need to carbohydrate load.

Question 27
What is the effect of the application of the principles of training on the physiological adaptations to training?

Criteria	Marks
• Makes evident the relationship between specific physiological adaptations and the principles of training. • Clearly indicates a broad range physiological changes which occur as a result of the application of the principles of training • Provides examples to support the relationship.	**8**
• Provides accurate reasons to support their statements about the application of the principles of training to physiological adaptations. • Provides relevant examples.	**6 – 7**
• Provides features of the principles of training and relates these to physiological adaptations. • Provides examples	**4 – 5**
• Sketches in general terms the principles of training and physiological adaptations.	**2 – 3**
• Provides some relevant information about the principles of training OR physiological adaptations.	**1**

Students learn about

- principles of training
  - progressive overload
  - specificity
  - reversibility
  - variety
  - training thresholds
  - warm up and cool down
- physiological adaptations in response to training
  - resting heart rate
  - stroke volume and cardiac output
  - oxygen uptake and lung capacity
  - haemoglobin level
  - muscle hypertrophy
  - effect on fast/slow twitch muscle fibres

Students learn to

- analyse how the principles of training can be applied to both aerobic and resistance training
- examine the relationship between the principles of training, physiological adaptations and improved performance

Answers could include but not be limited to:

- Progressive overload is the gradual increasing of a training load.
- Specificity is ensuring that the training being completed by the athlete is specific to the goals that they are trying to attain.
- Reversibility is the process of losing an athlete's fitness.
- Training thresholds is the point at which a training 'gain' is made.
- Resting Heart Rate, Stroke Volume, Cardiac Output, Oxygen Uptake, Lung Capacity, Haemoglobin levels, Muscle Hypertrophy, Effect on Fast and Slow twitch muscle fibres.

Sample answer

Progressive overload involves increasing the training load and this can be applied to all types of training. For example, to progressively overload in strength training you would lift more weight, do more repetitions or sets. This overload would lead to an increase in muscle hypertrophy which is an increase in the diameter of muscle fibres as they need to get larger to adapt to the increase load they are lifting.

Another example of progressive overload is through aerobic training where overload can occur through increasing the speed of running, running further or decreasing rest times. One of the changes which occur as a result of this is an increase in oxygen uptake. This is the amount of oxygen which can be absorbed into the blood stream during maximal exercise and overload during aerobic training will increase this adaptation.

Training thresholds are an important training principle. It is the point at which a training gain can be made. Below 60% of maximum heart rate (MHR) there is little improvement in the ability to deliver oxygen to working muscles. Training above this aerobic threshold the body adapts to the stress by increasing stroke volume and cardiac output. This means that the body is better able to perform aerobic activities in the future.

As the training load approaches and goes past 85% MHR there is a large degree of stress on the cardiovascular system and this leads to an increase demand on oxygen. The lungs have to work very hard at this level of effort and as a result will become stronger and more efficient in providing oxygen to working muscles through this improved capacity.

Reversibility is the loss of fitness gains previously made. Changes to resting heart rate (RHR) is a good indicator of fitness gain and it will be lowered as improvements in stroke volume occur as a result of training. If training ceases these adaptations will be reversed and as a result the RHR may start to increase.

Option 3 – Sports Medicine

Question 30a

Explain the management procedures for soft tissue injuries.

Criteria	Marks
• Clearly explains the management procedures used for soft tissue injuries • Makes the relationship clearly evident between the management procedure and soft tissue injuries • Provides examples showing how management assists injury repair	**8**
• Demonstrates the management procedure for soft tissue injuries • Relates the management procedure to soft tissue injury • Provides some examples showing how management assists injury repair	**6 - 7**
• Provides characteristics and features of management of soft tissue injuries • Recognises a soft tissue injury	**4 - 5**
• Sketches in general terms some management procedures and/or soft tissue injuries	**2 - 3**
• Provides facts or information regarding injury management or classification of injuries.	**1**

Students learn about

- soft tissue injuries
  - tears, sprains, contusions
  - skin abrasions, lacerations, blisters inflammatory response

Students learn to

- manage soft tissue injuries:
  - RICER (Rest, Ice, Compression, Elevation, Referral)
  - immediate treatment of skin injuries

Answers could include but not be limited to:

Management procedures:

- RICER for tears, sprains and contusions
- Immediate treatment of skin injuries – for abrasions, lacerations and blisters

Sample answer

There are two management procedures of soft tissue injuries. For tears, sprains and contusions the RICER procedure is used and for skin injuries e.g. abrasions and lacerations immediate treatment includes cleansing and preventing infection.

Rest is the first step in the RICER management procedure. This means the injured played is stopped from playing and is placed in a comfortable position with the injury elevated and supported. By resting the player, it reduces bleeding into the injury and prevents further injury. This is important to assist the healing process and ensure that the injury heals correctly as quickly as possible. A basketball player who has twisted their ankle causing a ligament sprain would be moved to the sideline once assessed and laid down with the ankle and foot supported on a seat or bag above the level of the heart.

Ice is used next to reduce pain, blood flow, swelling, enzyme activity and spasm which will also aid in quicker and more effective recovery. Ice can come in a variety of forms such as crushed ice in a wet towel wrapped around the injury, frozen gel packs and iced water in a bucket. The ice is not to be put directly on the skin as it can cause burns and should not be applied to cuts or badly damaged skin. The ice needs to be applied for 20 minutes every 2 hours for up to four days to the injury eg hamstring tear, to produce numbness, reduce bleeding and swelling and ensure that injury repair occurs in a speedy and effective way.

Compression in the form of a compression bandage is used to reduce swelling and decrease bleeding to the injury. The bandage is wrapped around the injured area e.g. sprained wrist firmly to slow the passage of fluid including blood to the area, making sure to finish compression moving towards the heart. Compression needs to occur at the time of the injury and reapplied, especially after icing, for at least 24 hours to ensure that swelling is reduced and the inflammatory phase of the inflammatory response is moved through as quickly as possible. Compression can also be used to hold ice in place.

Elevation involves raising the injury area above the level of the heart by placing support under the injury e.g. ankle onto a pillow. This should occur as much as possible over the next 72 hours to again assist in efficient injury repair and recovery. Elevation decreases bleeding, reduces swelling and throbbing to decrease pain and damage to the injury site and promotes repair.

Referral is the last step. The injured athlete then needs to be referred to medical assistance for example see a doctor or physiotherapist. This will ensure the nature and full extent of the injury (e.g. large contusion of the thigh) is known allowing an effective rehabilitation program to be developed and allow the athlete to heal.

The immediate treatment of skin injuries such as lacerations, abrasions and blisters needs to occur to reduce the risk of infection and promote healing. Abrasions cause pain and shallow bleeding e.g. a graze from falling on the netball court. They need to be gently cleaned and sterilized to prevent infection. Lacerations are flesh wounds with irregular tears. The area needs to be cleaned e.g. using antiseptic soap, dried and a sterile pad applied to prevent bleeding. Lacerations longer than 1 centimetre need to be referred to a doctor where stiches may be required. Blisters are caused by fluid collecting below or between skin layers (usually due to friction) leading to intense pain. Management of blisters includes rest for 24 hours to give the fluid time to disappear. If after 24 hours the blister remains and is causing concern, it may need to be surgically released and a donut pad applied. Torn blisters need to be washed with soap and warm water and dabbed with liquid antiseptic. Dry the area and put on an antiseptic ointment. A 'second skin' dressing can help the healing process.

Question 30 b
Analyse the role that sports medicine plays in addressing the needs of female athletes.

Criteria	Marks
• Demonstrates knowledge of the considerations for female athletes • Makes evident the role of sports medicine to address the considerations of female athletes • Provides relevant examples	**11 – 12**
• Discusses the considerations of female athletes and how they are addressed • Provides examples	**8 – 10**
• Provides characteristics and features of the considerations for female athletes and how they are addressed • Provides some examples	**5 – 7**
• Sketches in general terms the considerations of female athletes and how these are addressed	**3 – 4**
• Provides some relevant information of the considerations of female athletes	**1 – 2**

Students learn about

- Female athletes
  - Eating disorders
  - Iron deficiency
  - Bone density
  - pregnancy

Students learn to

- assess the degree to which iron deficiency and bone density affect participation in sport

Sample answer

Females who participate in sport and who exercise are at risk of medical concerns that can affect their health and performance. These relate to dietary needs as well as pregnancy and menstruation.

Eating Disorders – Anorexia nervosa, bulimia nervosa and disordered eating are increasingly common among female athletes, especially those that participate in sports where body shape is important such as gymnastics and diving. Wider societal pressures to conform to certain body images of body shape is reinforced by the media and peers. Coaches and parents need to place realistic expectations on female athletes, and promote health and performance over image. They must be aware of warning signs of eating disorders such as changes in mood, altered diets, increased exercise levels and rapid changes in body shape.

Iron Deficiency – is essential in delivering oxygen to working muscle and organs. Females, especially endurance athletes like marathon runners are more at risk of low levels of iron (anaemia). This is often caused by inadequate intake of sources rich in iron (eg lean red meat), high volumes of endurance training, naturally low haemoglobin levels or the result of the natural menstrual cycle. The effects are early fatigue, lower energy levels which will have a detrimental effect on an athlete's ability to train and perform especially in aerobic sports. To remedy this female athletes should ensure an adequate intake of iron, by eating foods such as lean red meat, tuna, leafy greens and foods rich in Vitamin C which enhance iron absorption. Supplementation is also an option.

Bone density – As females age they are more at risk of low levels of bone density. This leads to increased risk of bone fractures and musculoskeletal injury and disease, such as osteoporosis. This is linked to the amount of calcium found in bones. Females must ensure they have an adequate intake of calcium. This can found in dairy foods and salmon. Daily exercise that is weight bearing such as walking and light resistance training will help strengthen bones.

Pregnancy – Pregnant females should partake in physical activity. This will help them maintain a healthy weight, flexibility, strength and cardio-respiratory endurance. These are important for the mothers health before and after birth. Intensity should decrease to gentle exercise in the third trimester, and bouncing or jumping exercises should be avoided. Thermoregulation is also a concern, as a pregnant female is more at risk of hyperthermia. Exercise should be performed during cooler times of the day with adequate hydration. Sports involving contact should be avoided, and light contact sports like netball should cease after the first trimester. After this swimming, walking, pilates and group fitness are advised.

Option 4 - Improving Performance

Question 31a

Using an athlete in a specific sport, analyse TWO training types that could improve their performance.

Criteria	Marks
• Demonstrates a comprehensive knowledge and understanding of two training types • Makes clear the implications of these training types with the improved performance of a specific athlete • Provides a range of relevant examples to illustrate answer • Presents ideas in a clear and logical way	**8**
• Inquires into the relationship between two training types and the improved performance of a specific athlete • Provides relevant examples to illustrate answer • Presents ideas in a clear and logical way	**6 – 7**
• Describes the relationship between training types and a specific athlete • Provides some relevant examples to illustrate answer	**4 – 5**
• Outlines the relationship between training types and athletes • Provides some examples	**2 – 3**
• Identifies ways in which athletes can train OR • Provides information about the needs of a specific athlete	**1**

Students learn about

- Strength training
  - Resistance training eg elastic, hydraulic
  - Weight training eg plates, dumbbells
  - Isometric training
- Aerobic training
  - Continuous/uniform
  - Fartlek
  - Long interval
- Anaerobic training (power and speed)
  - Developing power through resistance/weight training
  - Plyometrics
  - Short interval

Students learn to

- Analyse TWO of the training types by drawing on current and reliable sources of information to:
  - Examine the types of training methods and how they best suit specific performance requirements
  - Design a training program
  - Describe how training adaptations can be measured and monitored
  - Identify safe and potentially harmful training procedures

- Flexibility training
  - Static
  - Dynamic
  - Ballistic

- Skill training
  - Drills practice
  - Modified and small sided games
  - Games for specific outcomes, eg decision-making, tactical awareness

Answer may include, but not limited to:

Training will improve athletic technique and performance if the correct training methods are employed and all types of training are included in a program such as **strength, aerobic, anaerobic, flexibility and skill training**. The answer requires that two types of training are analysed, providing extensive information on the type of training and the methods needed to improve performance and technique for a specific athlete. Students need to include specific examples and clearly identify the relationship between the training type and method and how it improves performance and technique.

Example of what could be included in regards to Skill Training:
Skill training includes drills which are designed to be specific to the sport to improve athlete's technique and performance. Coaches will use specific drills to highlight aspects of the game that needs improving or to refine techniques such as dribbling or defensive work in soccer as an example. Drills can be simple to complex depending on the athlete's ability and will relate to the skills involved in the sport. Coaches can utilise specific drills to highlight player's weaknesses and strengths and can incorporate both offensive and defensive drills to improve sports specific techniques.

Modified and small sided games allow coaches to improve players sport specific adaptations such as tactical and technical skills, communication and teamwork which would be needed in a sport such as soccer. Fitness improvements can also be gained by utilising small sided games and rules can be adjusted to highlight specific skills or tactical situations in small sided modified games such as 3 a side soccer.

Games for specific outcomes assist to improve player's decision making abilities and tactical plays. Coaches need to encourage their team players to make decisions so that when they are in a competitive situation these skills are more highly developed. Sport specific adaptations, such as fitness aspects, can also be improved during these games.

Question 31b

Justify how each of the periodisation phases is used when planning a training year.

Criteria	Marks
• Supports the argument for the inclusion of each periodisation phase when planning a training year • Makes evident the relationship between phases of a training year and improved performance • Provides relevant examples	**11 – 12**
• Provides reasons why each periodisation phase of a training year is important in improving performance • Provides relevant examples	**8 – 10**
• Provides characteristics and features of periodisation phases of a training year • Provides relevant examples	**5 – 7**
• Sketches in general terms some of the phases of a training year	**3 – 4**
• Recognises and names the phases of a training year AND/OR • Provides an example of periodisation events	**1 – 2**

Students learn about

- Planning a training year (periodisation)
  - phases of competition (pre-season, in-season and off-season phases)
  - subphases (macro and microcycles)
  - peaking
  - tapering
  - sport-specific subphases (fitness components, skill requirements)

Students learn to

- describe the specific considerations of planning for performance in events/competitions. How would this planning differ for elite athletes and recreational/amateur participants?
  - develop and justify a periodisation chart of the fitness and skill-specific requirements of a particular sport

Sample answer

The process of periodisation is defined as division of the annual training plan into smaller and more manageable parts to ensure correct peaking for the main competition of the year. The annual plan is divided sequentially into the three main phases; pre-season, in-season and off-season. Built within the phases are; macrocycle (multi-week training cycle) and microcycle (weekly training cycle), peaking, tapering and sport specific subphases. The combination of different training cycles within the annual plan will depend on the specific goals of the competition cycle, but are often needed to ensure athletes are prepared to perform in the in-season and minimise the risk of injury.

Periodisation is important in reducing the risk of overtraining, and allows the athlete to peak at a predictable time, usually coinciding with an important competition (big state championships). Another important reason for this approach to training is that different physiological systems vary in their retention rate after training. Therefore, by varying the training loads as the season progresses, the desired adaptations, which are associated with peak performance, are more likely to be achieved.

The pre-season phase (macrocycle) is the lead up to the competitive season. Typically this phase will contain a variety of training means designed to develop fundamental performance characteristics such as motor performance skills and fitness which create the foundation of the athlete's training base. Towards the end of the pre-season phase the athlete will participate in specific preparation (eg skill based preparation). Specific preparation will involve sport specific activities (eg training games), which

are marked by higher training loads that are designed to elevate the athlete's performance capacity prior to transitioning into the in-season. The pre-season is very important since it provides the base for the in-season training and performance, and without thorough preparation will reduce an athlete's performance in the beginning stages of competition.

The in-season phase (macrocycle) attempts to optimise the athlete's preparedness for this period. This is accomplished by maintaining, or slightly improving, the athlete's physiological and sport specific skills established during the pre-season period. Generally, this period is marked by a reduction in training workloads that target general preparation in conjunction with increasing the emphasis on training activities that target sport specific fitness while elevating technical and tactical skills around the needs of the competitive schedule (eg strategic training based on attacking patterns of play to serve more goals). This period ensures that the team or athletes mentally and physically prepare for competitions and regular sporting events.

The off season phase (macrocycle) is a linking period. The transition period serves to bridge between two macrocycles, annual training plans or multi year training structures. This period is marked by a large reduction in training stressors and is designed to only be used to maintain fitness and technical skills, while allowing the athlete to recover from previous training activities and allow them to be refreshed mentally and physically (eg cross-training or engaging in core stability exercises like Pilates in preparation for the next competition phase).

End of paper