Charles Darwin University

Final Examination

Family Name						
Given Name/s						
Student Number						
Teaching Period	Semester 1, 2019					

SPE311 – Advanced Studies in Exercise and Sport Science 1	DURATION	
	Reading Time:	10 minutes
	Writing Time:	120 minutes

INSTRUCTIONS TO CANDIDATES
The examination is divided into three (3) sections. Attempt all questions. Section A. Multiple Choice. 40 Marks. Answer on examination. Answer on exam paper. Section B. Short Answers. 20 marks. Answer on examination. Answer on exam paper. Section C. Short Essays. 40 Marks. Answer on examination. Answer section C in provided 8-page booklet. Total marks equal 100 marks.

EXAM CONDITIONS
<u>You may begin writing from the commencement of the examination session.</u> The reading time indicated above is provided as a guide only.
This is a CLOSED BOOK examination
Any calculator is permitted
No handwritten notes are permitted
No dictionaries are permitted

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
No additional printed material is permitted	1 x 8 Page Book Formula Sheet/s

THIS EXAMINATION IS PRINTED DOUBLE-SIDED.

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Section A

Multiple Choice Questions

Total marks for this section: 40 marks

This section should be answered on this examination paper provided. Circle the letter that corresponds to the most appropriate answer. Each question is worth 2 marks.

Suggested time allocation for Section A: 40 minutes

Section B

Short Answer Questions

Total marks for this section: 20 marks

Each question is worth two (2) marks and marks are distributed equally throughout each question.

Answer in the spaces provided.

Suggested time allocation for Section B: 40 minutes

Question 1

List three effective and positive features of systematic talent identification programs, which are conducted in Australian sports.

1._____

_____

2._____

_____

3._____

_____

(Marks: 2)

Question 2

Explain the differences and provide examples of open-ended optimisation, relative optimisation and absolute optimisation.

1._____

_____

2._____

_____

3._____

_____

(Marks: 2)

Question 3

Based on your learning activity week 7 explain the relationship between static and dynamic ROM/flexibility.

_____

_____

_____

_____

(Marks: 2)

Question 4

Based on learning activity week 2, which evaluated the relationship between body mass, muscle mass and adipose/fat mass and human torque work and power output what did you discover?

_____

_____

_____

_____

_____

(Marks: 2)

Question 5

List some important postural factors associated with performance in female gymnasts, distance runners, contact-sport athletes and sprint runners.

female gymnasts

_____

_____

distance runners

_____

_____

contact-sport athletes

_____

_____

sprinter

_____

_____

(Marks: 2)

Question 6

Based on your lecture on power in sport, define power and then explain the different methods to develop power in sport.

Definition

_____
_____
_____
_____

Different Methods

_____
_____
_____
_____

(Marks: 2)

Question 7

Angular and linear displacement training techniques can be either passive or active in terms of increasing range of movement (ROM). Explain the difference between passive and active methods.

Passive

_____
_____
_____
_____

Active

_____
_____
_____
_____

(Marks: 2)

Question 8

Explain in the context of sport biomechanical concepts of linear velocity, linear acceleration, angular displacement, angular acceleration, linear momentum, angular momentum and drag forces.

_____
_____
_____
_____
_____
_____
_____

(Marks: 2)

Question 9

Explain the advantages and disadvantages of qualitative and quantitative analysis when analysing freestyle swimming in biomechanics and support your answers with examples from exercise and sport.

Qualitative

_____
_____
_____
_____

Quantitative

_____
_____
_____
_____

(Marks: 2)

Question 10

Based on the examples presented in lectures, tutorials and laboratories indicate the methods and steps required to develop predictive mathematical biomechanical models in track sprinting 100m, which links laboratory derived measures (independent variables) with performance in competition (dependent variables).

Methods_____
_____
_____
_____
_____

Steps_____
_____
_____
_____
_____

(Marks: 2)

This is the end of Section B (Total 20 Marks). Please ensure that you have written your name and student number on your examination sheet.

Section C
Extended Answer Questions

Total marks for this section: 40 marks

Each question is worth ten (10) marks. Answer in the booklet provided.

Suggested time allocation for Section C: 40 minutes

Question 1

Explain in detail the "Assessment and Modification Model" process applied to sport and support your concepts with examples from sport and exercise.

(10 marks)

Question 2

Explain the process of hierarchical or deterministic modelling for qualitative and quantitative analysis in sports. Select one sport or event and conduct a hierarchical/ deterministic modelling analysis.

1. Explain the sport. (5 marks)

2. Hierarchical modelling analysis. (5 marks)

Question 3

Sports instrumentation and technology have been applied to measure the constructs of force, torque, linear momentum, angular momentum, angular speed and power. Based on your lectures, your textbook, laboratories and research, explain how each construct can be measured and how they can be used to predict sports performance.

1. Explain how each construct/concept can be measured. (5 marks)

2. How they can be used to predict performance. (5 marks)

Question 4

Image analysis via video recording systems and other technologies are now used frequently in exercise and sport science to provide research data, coaching data and visual feedback to athletes. Explain the two predominant methods used under what situations would you use these different types of biomechanical image analyses?

(10 marks)

This is the end of Section C (Total 40 Marks). Please ensure that you have written your name and student number on your examination sheet.

BIOMECHANICAL FORMULA AND CONSTANTS

$F = ma$

$PE = Wh$ or mgh

$W = mg$

$v = u + at$

$a = (v-u)/t$

$v = s/t$

$s = ut + \frac{1}{2}at^2$

$v^2 = u^2 + 2as$

$R = (v^2 \sin 2\theta) / g$

$d_H = v \cos \theta \times t$

$w = \theta / t$

$\alpha = (\omega_f - \omega_i) / t$

$v_T = \omega r$

$I = Ft$

$F = \mu N$

$Ft = m(v-u)$

$I = \Sigma mr^2$

$T = I\alpha$

$F_c = mv^2/r$

$H = I\omega$

$p = mv$

$g = 9.8ms^{-2}$

$F_D = \frac{1}{2}C_D\rho A_\rho v^2$

$w = Fd$

$KE = \frac{1}{2}mv^2$

Working Sheet