



SPORT AND EXERCISE SCIENCE: PAPER II

EXAMINATION NUMBER

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Time: 2 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 20 pages. Please check that your question paper is complete.
2. All the questions must be answered on the question paper.
3. Read the questions carefully.
4. Use the total marks awarded for each question as an indication of the detail required.
5. It is in your own interest to write legibly and to present your work neatly.

Question	1	2	3	4	5	6	7	8	9	10	11	Total
Marks												

QUESTION 1

1.1 Goal setting is an important aspect of performance improvement. Explain the negative impact on an athlete, should poor or no goal setting occur.

(3)

1.2 Setting goals assists in improving performance and also has an impact on mental preparation. Explain how the setting of goals will impact on various aspects of an athlete's mental qualities by completing the table below.

Mental Qualities	The influence of goal setting on ...
Concentration	
Confidence	
Control	
Commitment	

(8)
[11]

QUESTION 2

For each activity provided below, state what movement patterns are occurring at the stated joint **AND** provide a reason to substantiate your response.

SKIPPING with the skipping rope (elbows)

Answer:

Movement Pattern/s:

Reason:

CALF RAISERS when elevated (ankles)

Answer:

Movement Pattern/s:

Reason:

STAR JUMPS/ JUMPING JACKS (shoulder)

Answer:

Movement Pattern/s:

Reason:

[6]

3.2 Conditioning coaches and fitness trainers need to be aware that muscles always work in pairs. In order to prevent injury, both the agonist and antagonist muscles need to be exercised. In each of the following examples, name the agonist (prime mover) **AND** the antagonist muscles.

(a) The initial leg movement when pulling the leg back before kicking a soccer ball.

(i) Agonist muscle _____ (1)

(ii) Antagonist muscle _____ (1)

(b) The arm muscle movement when executing a free shot in basketball, as the arm moves forwards.

(i) Agonist muscle _____ (1)

(ii) Antagonist muscle _____ (1)

(c) Raising a dumbbell when executing a bicep curl.

(i) Agonist muscle _____ (1)

(ii) Antagonist muscle _____ (1)

3.3 The role of the coach, especially those coaching junior sporting teams, is very complex. An area often overlooked is that of injury prevention. Outline **FOUR** ways in which a coach can help reduce or prevent sporting injuries.

(4)
[20]

QUESTION 4

4.1 Using the keywords, explain the various biomechanical principles being applied in the picture of a rugby player being tackled below.



[Source: <<https://www.rugbynetwork.net> Accessed 12/2/15>]

Action Reaction Momentum Force Resistance Newton's Laws

(12)

4.2 Describe how the principles of **force summation** are applied in this image of an athlete throwing a discus.



[Source: <<https://www.Picgifs.discus+technique> Accessed 12/2/15>]

(6)

4.3 Below are the statistics of judo fighters resisting a pushing force.

Fighting condition	Force in Newton to push the fighter off balance
Crouching with feet together.	35 N
Fighter leaning towards the opponent.	75 N
Fighter standing with one foot in front of the other. Feet are shoulder width apart.	65 N

Using the data provided, explain why the number of Newtons required to push the fighter off balance in each fighting position is different.

(6)

4.4 The statistics below were gathered as a cricket bowler threw a ball using various techniques.

Situation/action	Distance thrown
Only using the lower arm. No other body part moves at all.	90 cm
Lower and upper arm is used.	8 m
Lower arm, upper arm and torso are used.	17 m

Describe the reasons for the results in the table above.

(3)

4.5 Explain why it is that a golf ball, when hit, will travel further than another smooth ball of the same size and weight. You may use diagrams to assist with your explanation.

(4)
[31]

QUESTION 5

5.1 Explain the effect of a badminton racket in a player's hand when hitting a shuttlecock.

(4)

5.2 Compare the possible differences in performance between short limbed discus throwers and longer limbed discus throwers.

(3)

5.3 Identify the following activities by completing the table below. Tick the appropriate column.

Activity	Linear motion	Angular motion	General motion
Sprinting			
Throwing a ball underhand			
Driving a Formula 1 car			

(3)
[10]

6.2 'Feedback from actual movement (knowledge of performance) is a better form of feedback than outcome information (knowledge of results)'. Explain why this statement could be true.

(3)
[8]

QUESTION 7

Diagrams of Frisbees in various positions



[Source: <<https://www.frisbee> Accessed 12/2/15>]

7.1 Indicate which picture (A, B or C) shows the Frisbee having the least amount of drag.

(1)

7.2 Indicate which picture (A, B or C) shows the Frisbee having the most amount of drag.

(1)

7.3 Provide **ONE** method an athlete could use to ensure that the Frisbee travels far.

(1)

7.4 Describe **TWO** examples of when it would be advantageous to increase drag in sport.

(4)
[7]

QUESTION 9

The Ironman consists of 3,86 km swimming; 180,25 km cycling, run a marathon of 42,2 km. It is one of the most awe inspiring events in sport. Finishing it is a victory. People vomit at the side of the road, they lose control of their basic functions, they collapse, they become delirious, desperate to reach the finish line. It evokes such emotion and requires you to dig to the depths, physically and mentally.

Even if your body does not break down through sheer fatigue, there is ample scope for an unsupported injury. When the gun goes off, chaos reigns for a minute or two. The idea is to get 'on the feet' of the fastest swimmers, in other words, move in behind them and take advantage of their slipstream. On the bike, however, it is forbidden to take advantage of someone's slipstream.

[Adapted from 'A life without limits.' Chrissie Wellington. Publisher – Constable and Robinson Ltd, London. 2012]

9.1 Athletes will compete in an event such as this for either intrinsic or extrinsic motivation. Explain the differences between these two types of motivation, providing appropriate sporting examples of each.

(4)

9.2 The sheer physicality of an event like the Ironman will undoubtedly result in overuse injuries. Name **ONE** possible overuse injury that an Ironman athlete could suffer from.

(1)

9.3 Provide a strategy that the athlete or coach could implement to prevent the overuse injury mentioned in Question 9.2 above from occurring.

(2)

9.4 Describe the effect on a swimmer who uses one arm only while swimming backstroke.

(1)

9.5 When swimming in a large group, the athletes, to benefit their performance, will attempt to place themselves in the best possible position within the group.

Using your knowledge of fluid forces, describe the technique that a swimmer will use to place him/herself perfectly within the group.

(6)
[14]

QUESTION 10

As the clock winds down, the kicker concentrates on the football, imagining it spiraling through the air between the two goal posts and scoring the winning goal ... Behind one stroke, she repositions her feet on the green and adjusts her grip on the club. She taps the golf ball, hoping to sink the putt on the 18th hole for the birdie and the win ... But instead of victory, what happens to these athletes? Failure. The pressure seems insurmountable and they fall victim to what sports psychologists call **the catastrophe theory**.

10.1 Explain this theory and the impact it could have on an athlete.

(5)

10.2 Explain how a coach and athlete will prepare for the possibility of the catastrophe theory occurring during competition.

(2)

10.3 'Arousal can differ depending on the physical activity that an athlete is participating in.' Explain this statement providing appropriate sporting examples.

(8)

10.4 There are times or situations where it is preferable to have an autocratic leader as opposed to a democratic leader.

10.4.1 Provide an example of a physical activity where an autocratic leader is absolutely essential.

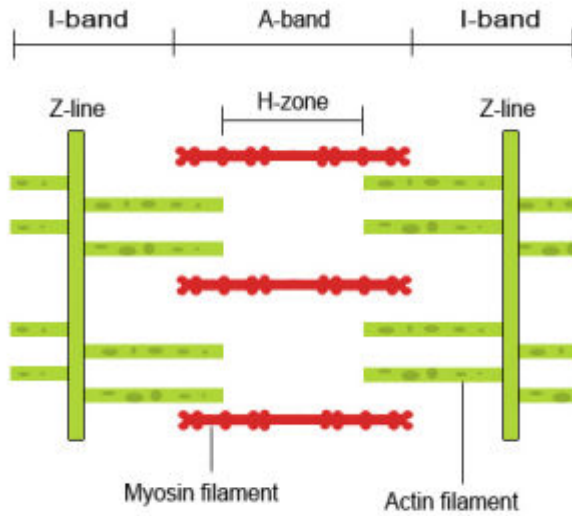
(1)

10.4.2 Explain why the autocratic leader is preferable in the activity stated above.

(2)

QUESTION 11

Diagram of a muscle spindle



[Source: <<https://sliding+filament+theory> Accessed 2/2/15>]

11.1 Explain the basic function of a muscle spindle.

(1)

11.2 When a muscle contracts three things take place. One of these is that the I-band shortens. Name the other **TWO** things that take place during a muscle contraction.

(2)

11.3 Explain the principle of muscle contraction known as the '**All or None**' law.

(2)
[5]

Total: 150 marks