NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE SUPPLEMENTARY EXAMINATIONS

DEPARTMENT OF SPORTS SCIENCE AND COACHING

THEORY: SSC2104: BIOMECHANICS

AUGUST 2012

3 HOURS (100 MARKS)

INSTRUCTIONS

Answer any four questions only.

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1. a) Briefly describe how the following scalar quantities are related, mass, weight and intertia.

    (15 marks)

    b) Using examples explain how the above scalar quantities can influence in some sporting activities?
    (10 marks)

2. Discuss the two relationships among the kinematic parameters of position, displacement, velocity and acceleration.
    (25 marks)

3. Briefly discuss the application of Newton's three laws of motion to some sporting activities.

    (25 marks)

4. a) What do you understand by Linear momentum?
    (5 marks)

    b)   Calculate:
    (i) The Linear momentum of a sprinter whose mass is 100kg and is running at 10m/s. (5 marks)
    (ii) The vertical and horizontal velocity of a 900N soccer player running across a field
    with a resultant Linear momentum of 500kg/m at 36^0 above the right horizontal.   (5 marks)

    c) Briefly explain the relationship between impulse and momentum.
    (10 marks)

5. a) Using a diagram describe the components of a Lever system.
    (5 marks)

    b) Using examples describe how athletes make use of the first second and third class Levers.

    (20 marks)

6. a) In sport there are many events in which athletes and objects are projected into the air.
    Briefly explain the factors that can influence the trajectory of these objects.
    (15 marks)

    b) At the apex of a vault when for instant a pole-vaulter is going neither up nor down,
    explain what happens to the athlete's kinetic energy, potential energy and the force of gravity.
    (10 marks)

END OF EXAMINATION