UNIVERSITY OF JOHANNESBURG

JUNE EXAMINATION

PROGRAM	:	**HUMAN MOVEMENT STUDIES**
MODULE NAME	:	**KINESIOLOGY**
MODULE CODE	:	**KIN01A1 / MBK1A01 / MBK1A02 / BIK01Y1 (FIRST SEMESTER)**
DATE	:	**12 JUNE 2017**
DURATION	:	**TWO (2) HOURS**
TOTAL MARKS	:	**100 MARKS**

EXAMINER	:	**MRS FERREIRA**
MODERATOR	:	**PROF LATEGAN**
NUMBER OF PAGES	:	**NINE (9) PAGES**

INSTRUCTIONS TO CANDIDATES:

PLEASE MAKE SURE THAT YOU HAVE THE COMPLETE PAPER AND PLEASE ANSWER ALL THE QUESTIONS.
SECTION A: SKELETAL & MUSCULAR SYSTEMS
SECTION B: BIOMECHANICS

SECTION A: SKELETAL & MUSCULAR SYSTEM (50 MARKS)

QUESTION 1 [3]

Explain the two reference positions of the body and how they differ from each other.

QUESTION 2: Provide the correct answer [10]

1.1 The term VOLAR refers:
   a) The left side of the body
   b) The top of the body
   c) The palm of the hand

1.2 CONTRALATERAL is a term used to refer to:
   a) Opposite side of the body
   b) Same side of the body
   c) One side of the body

1.3 Identify the plane of motion during SHOULDER EXTENSION.
   a) Frontal plane
   b) Sagittal plane
   c) Transverse plane

1.4 Identify the plane of motion through which ANKLE ABDUCTION takes place.
   a) Frontal plane
   b) Sagittal plane
   c) Transverse plane

1.5 Identify the axis of rotation around which KNEE FLEXION takes place.
   a) Vertical axis
   b) Anterior-posterior axis
   c) Frontal/lateral axis

1.6 Identify the axis of rotation around which GLENO-HUMERAL ADDUCTION takes place.
   a) Vertical axis
   b) Anterior-posterior axis
   c) Frontal/lateral axis

1.7 Straightening the elbow may be described as:
   a) Elbow flexion
   b) Elbow supination
   c) Elbow extension

1.8 The WRIST (RADIOCARPAL) joint can be classified as a:
   a) Condyloid joint
   b) Pivot joint
   c) Hinge joint

1.9 The ATLANTOAXIAL JOINT may be classified as a:
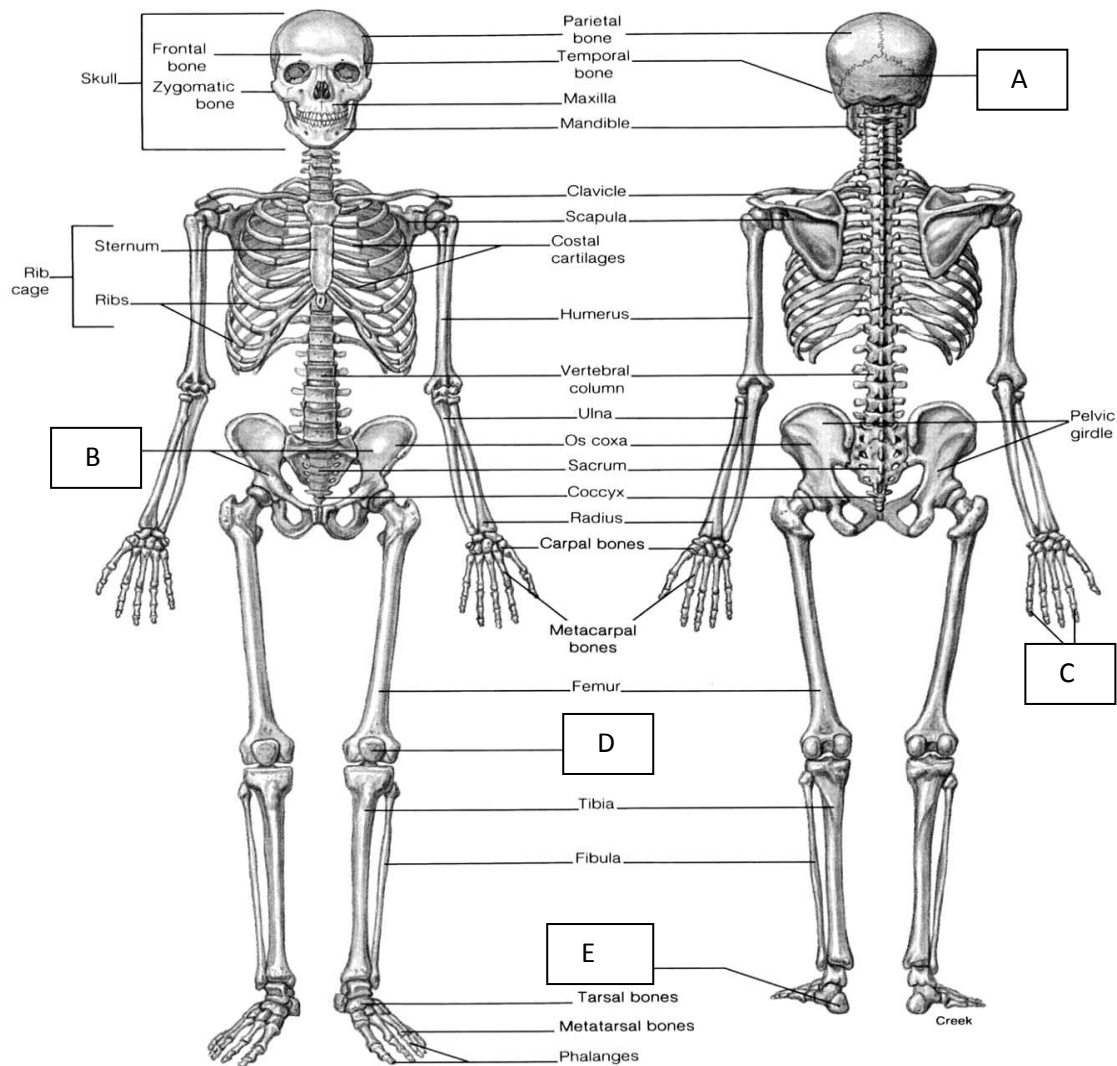   a) Plane joint
   b) Pivot joint
   c) Saddle joint

1.10 The thoracic spine consists of how many vertebrae?
   a) 7
   b) 12
   c) 5

QUESTION 3: Label the following diagram for A-E   [5]

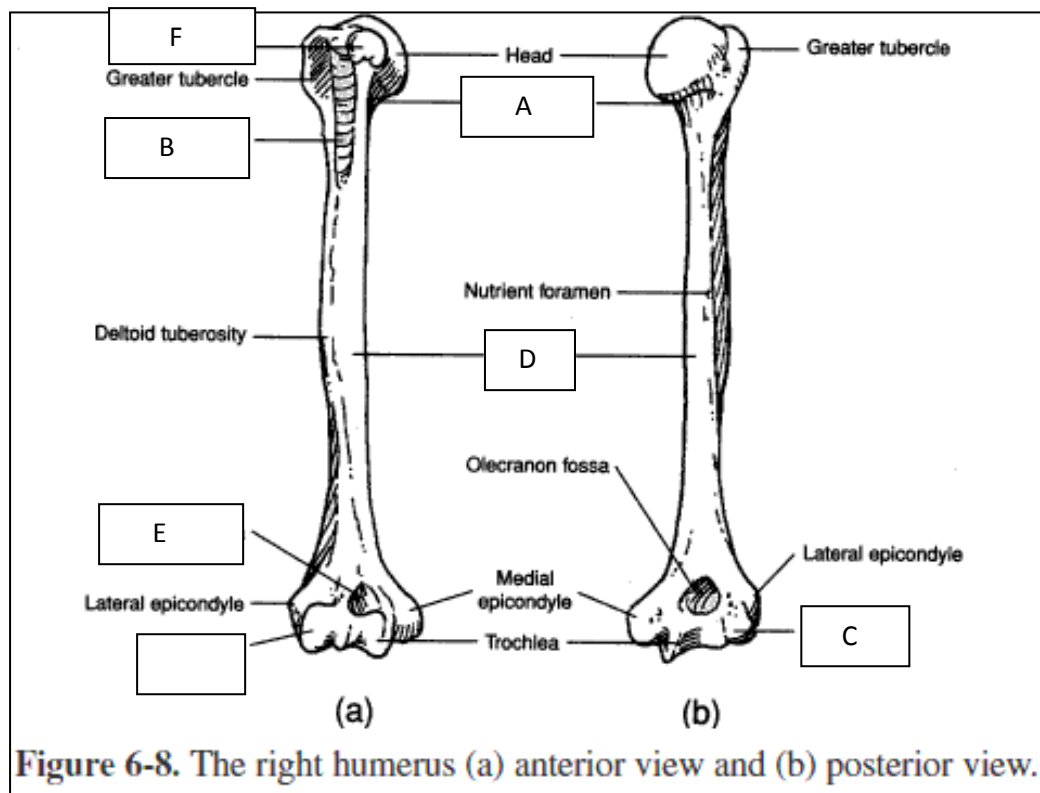## QUESTION 4   [8]

Name and explain four (4) different types of muscle contractions.

QUESTION 5: Please label the following bone markings A-F   [6]

Figure 6-8. The right humerus (a) anterior view and (b) posterior view.

QUESTION 6   [4]

Describe the origin and insertion of the following muscles:

   a. Subscapularis
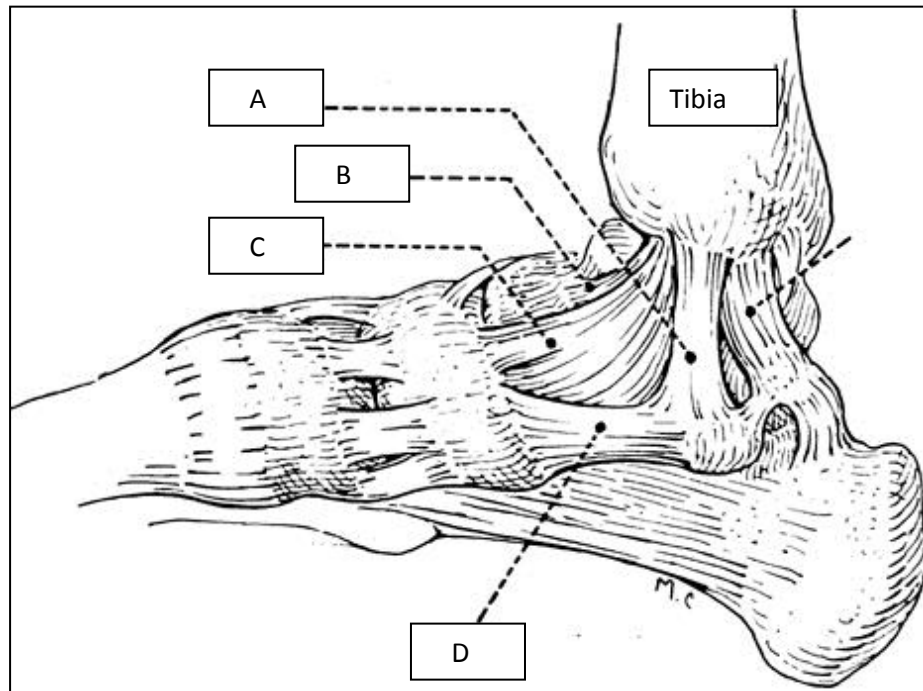   b. Tensor Fascia Latae

QUESTION 7   [4]

List four (4) muscles that do knee extension.

QUESTION 8: Identify the following ligaments (A-D) found at the ankle joint   [4]

QUESTION 9   **[4]**

Give the function of the following muscles:
  a) Semitendinosus
  b) Rectus Abdominis
  c) Supraspinatus
  d) Tibialis Anterior

QUESTION 10   **[2]**

Which four (4) movements take place in the lumbar spine?

SECTION A TOTAL: 50 MARKS

SECTION B: BIOMECHANICS (50 MARKS)

QUESTION 1   [4]

Explain the following key concepts found in Biomechanics: statics, dynamics, kinetics & kinematics.

QUESTION 2   [15]

Analyse the **Push-up** by means of an anatomical analysis. Use the table format below to describe the movement in terms of agonistic muscles for the following joints: glenohumeral joint and elbow joint.

Phase: Up / Down	Joint: GHJ EJ	Movement:	Agonistic muscles:	Type of contraction: Con / Ecc

QUESTION 3   [4]

What is the main goal of:
3.1 Golf put
3.2 Javelin throw
3.3 50m freestyle swimming
3.4 Ice skating

QUESTION 4   [4]

Name the following postural deviations:
4.1   Genu _____

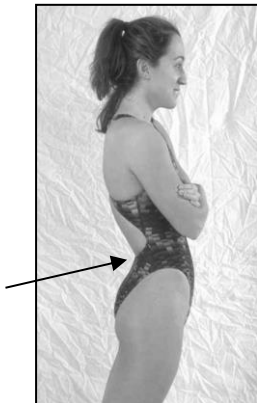4.2 Genu _____

4.3 Thoracic _____

4.4 Lumbar _____

QUESTION 5 [2]

Explain the following postural deviations:
5.1 S-shaped Scoliosis
5.2 Scheuermann's disease

QUESTION 6 [2]

What are the possible consequences/injuries for the following faulty postures (name only one for each question)?
6.1 Ankle/foot over-pronation
6.2 Duck Feet

QUESTION 7 [2]

Determine the kinetic energy of an object weighing 500kg and travelling at 65km/h.

QUESTION 8 [2]

Calculate the distance in metres that an athlete covers if he runs for 60 minutes at an average velocity of 16km/h.

QUESTION 9 [2]

Determine the height from which a ball was dropped if it took 15 seconds to hit the ground (you may ignore the effects of air resistance).

QUESTION 10 [4]

Determine the extra amount of work generated by a person with a height of 1.65m and weighing 74kg, lifting 20 boxes weighing 20kg each from the ground to a shelf 1.3m above the ground.

QUESTION 11 [2]

Calculate the force needed to generate 275Nm of torque using a lever 60cm in length.

QUESTION 12 [3]

A shot put thrower delivers the shot put at an angle of 40° at a velocity of 19m/s. Calculate the vertical velocity of the shot put.

QUESTION 13 [4]

Calculate the power generated by a weight lifter who performs 10 repetitions of the shoulder press exercise with a weight of 85kg in 25 seconds; the weight is lifted 45cm from the starting position.

SECTION B TOTAL: 50

SECTION A & B TOTAL: 100

Formulas

$v = s/t$ velocity = displacement / time

$a = (v-u)/t$ acceleration = (final vel. –initial vel.)/time

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

$v = u + at$

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

Where: u = initial velocity, v = final velocity, t = time and a = acceleration

$F = ma$ Force = mass x acceleration

$Ft = m(v – u)$ Impulse = mass (final velocity – initial velocity)

$W = Fs$ Work = Force x distance

$P = W/t$ Power = Work / time

$PE = mgh$ Potential Energy = mass x gravity x height

$KE = \frac{1}{2}\,mv^2$ Kinetic Energy = ½ x mass x (velocity)^2

$M = mv$ Momentum = mass x velocity

E x EA = R x RA Effort x Effort arm = Resistance x Resistance arm

$MA = R/E$ Mechanical Advantage = Resistance / Effort

$T = F \times {}^{\perp}d$ Torque = Force x perpendicular distance