UNIVERSITY OF JOHANNESBURG

MAY & JUNE 2016 EXAMINATION

PROGRAM	:	**HUMAN MOVEMENT STUDIES**
MODULE NAME	:	**KINESIOLOGY 1A** **SECTION A: MUSCULAR & SKELETAL SYSTEMS** **SECTION B: BIOMECHANICS**
MODULE CODES	:	**KIN01A1** **HMS1AA1 & HMS2AB1** **MBK1A01 & MBK1A02** **BIOK01Y1 (FIRST SEMESTER)**
DATE	:	**26 MAY 2016**
DURATION	:	**2 HOURS (SECTION A: 60 MIN & SECTION B: 60 MIN)**
TOTAL MARKS	:	**100 (50 + 50)**

EXAMINER	:	**MRS S FERREIRA**
MODERATOR	:	**PROF L LATEGAN**
NUMBER OF PAGES	:	**THIS PAPER CONSISTS OF TEN (10) PAGES**

INSTRUCTIONS TO CANDIDATES:

SECTION A: MUSCULAR & SKELETAL SYSTEMS (HMS1AA1 & MBK1A01)

SECTION B: BIOMECHANICS (HMS2AB1 & MBK1A02)

PLEASE MAKE SURE THAT YOU HAVE THE COMPLETE PAPER AND PLEASE ANSWER ALL THE QUESTIONS.

SECTION A: SKELETAL & MUSCULAR SYSTEM

QUESTION 1 [3]

Explain the term "kinesiology".

QUESTION 2: Please provide the correct answer [10]

1.1 The term VENTRAL refers:
a) The left side of the body
b) The top of the body
c) The belly/front of

1.2 IPSILATERAL 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 HIP EXTENSION.
a) Frontal plane
b) Sagittal plane
c) Transverse plane

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

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

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

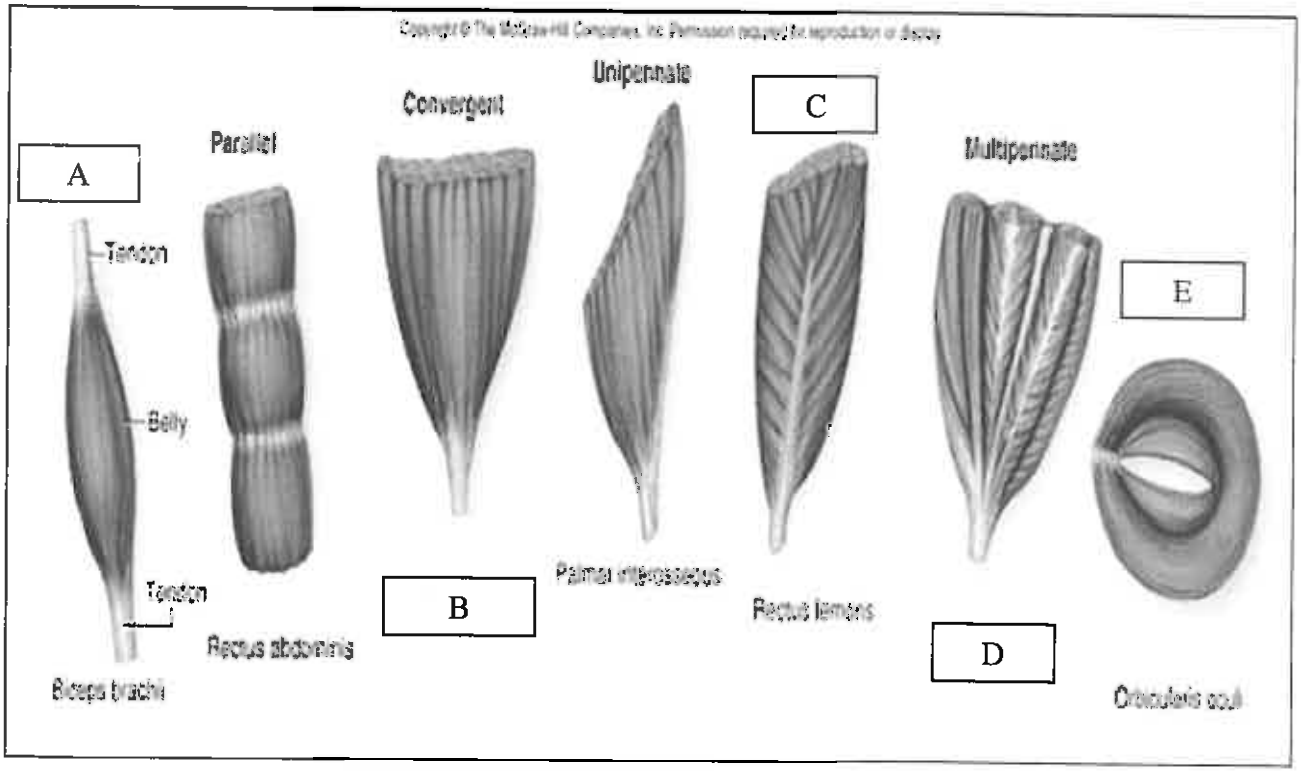
1.7 Straightening the elbow may be described as:
a) Elbow flexion
b) Elbow supination
c) Elbow extension
d) Elbow pronation

1.8 The ELBOW joint can be classified as a:
a) Ball-and-socket joint
b) Pivot joint
c) Hinge joint

1.9 The joint at the BASE OF THE THUMB may be classified as a:
a) Plane joint
b) Hinge joint
c) Saddle joint

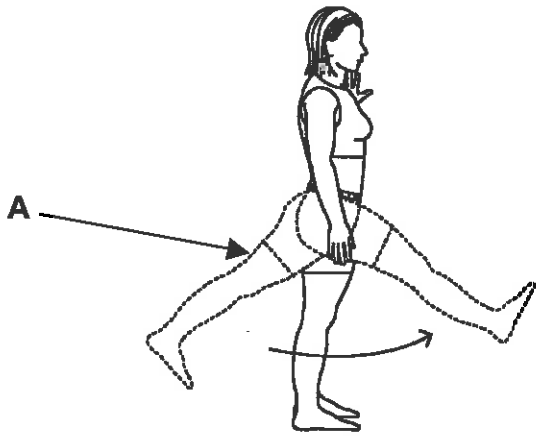
1.10 The cervical spine consists of how many vertebrae?
a) 7
b) 12
c) 5

QUESTION 3: Provide the correct answers for A-E. **[5]**

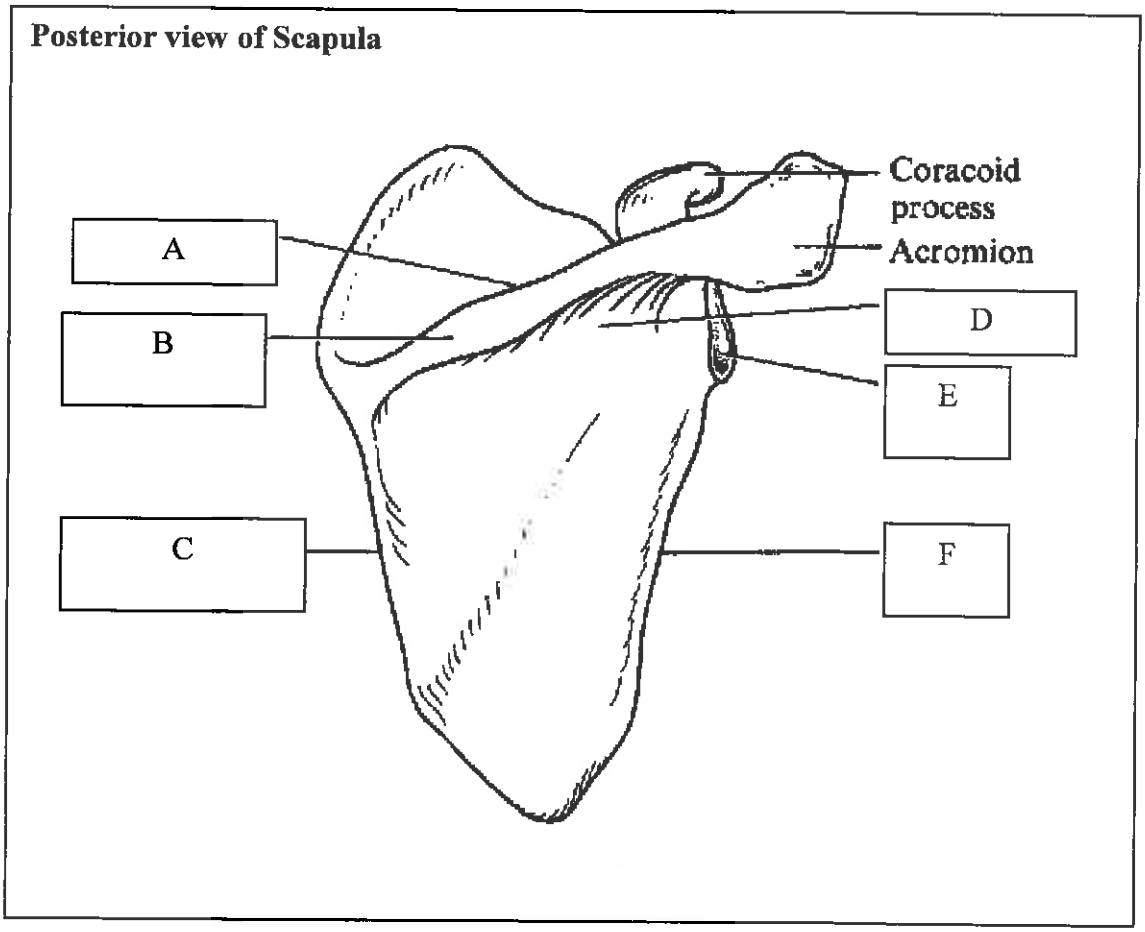


QUESTION 4 **[4]**

Identify the movement (A) and list three (3) muscles that contract CONCENTRICALLY during this movement



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



QUESTION 6 [4]

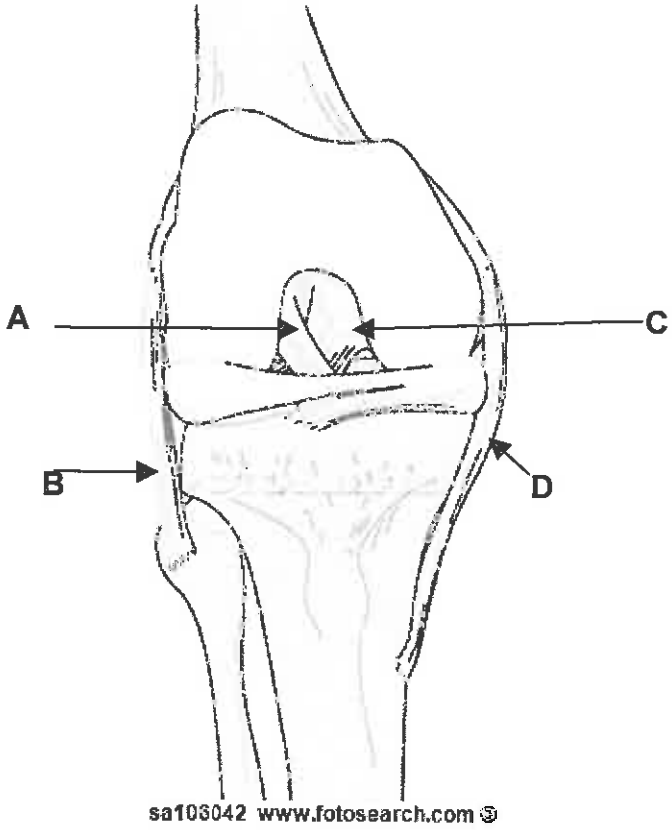
Describe the origin and insertion of the following muscles:

a. Supraspinatus
b. Vastus Medialis

QUESTION 7 [6]

List 6 movements that occur at the hip joint.

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



QUESTION 9 [2]

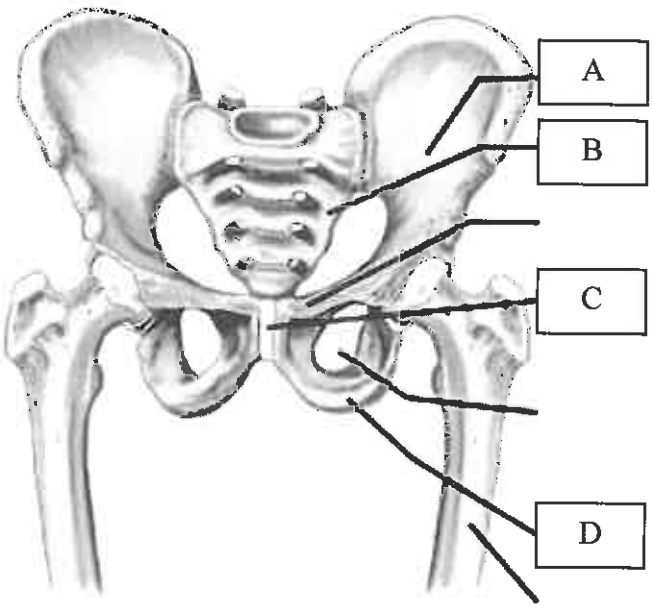
Name two (2) muscles that cause lateral flexion of the spine.

QUESTION 10 [5]

Give the one **main** function of the following muscles:

a) Biceps Brachii
b) Iliopsoas muscle
c) Rectus Femoris
d) Soleus
e) Erector spinae

QUESTION 11: Label the following diagram (A-D). [4]



SECTION B: BIOMECHANICS

QUESTION 1 [4]

Describe the following concepts and give an appropriate example:

1.1 Ballistic movement

1.2 Open-kinetic chain contraction

QUESTION 2 [15]

Analyse the **Bench Press** by means of an anatomical **a**nalysis. 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 Sprinting

3.2 Long jump

3.3 Marathon running

3.4 Gymnastics

QUESTION 4 [5]

Describe the following postural deviations:

3.1 Scheuermann's

3.2 Genu recurvatum

3.3 Kyphosis

3.4 Pes planus

3.5 Hallux valgus

3.6 Genu varum

QUESTION 5 [2]

Determine the kinetic energy of an object weighing 1000 kg and traveling at 40 km/h.

QUESTION 6 [2]

Calculate the distance in metres that an athlete covers if he runs for 1 hour at an average velocity of 13 km/h.

QUESTION 7 [2]

Determine the height from which a ball was dropped if it took 5 seconds to hit the ground (you may ignore the effects of air resistance).

QUESTION 8 [4]

Determine the extra amount of work generated by a person with a height of 1.7 m and weighing 87 kg, lifting 20 boxes weighing 20 kg each from the ground to a shelf 1.5 m above the ground.

QUESTION 9 [2]

Calculate the force needed to generate 350 Nm of torque using a lever 75 cm in length.

QUESTION 10 [3]

A javelin thrower delivers the javelin at an angle of 50° at a velocity of 22 m/s. Calculate the vertical velocity of the javelin.

QUESTION 11 [4]

Calculate the power generated by a weight lifter who performs 10 repetitions of the bench press exercise with a weight of 90 kg in 15 seconds; the weight is lifted 65 cm from the starting position.

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
$T = F \times \perp d$ Toque = Force x perpendicular distance