**ST MARY’S UNIVERSITY**

**TWICKENHAM, LONDON**

BSc Degree Examination students registered for Level **FOUR**

Title: **Structure and Function: The Lower Limb**

Code: **SRE4003**

Semester: **ONE**

Date: **January 14th 2019**

Time: **9:30 – 11:30AM**

TIME ALLOWED: **TWO** HOURS

This paper has **TWO** SECTIONS**:**

In SECTION ONE - Answer **ALL** questions.

In SECTION TWO - Answer **ALL** questions.

**SECTION ONE -** Answer **ALL** of the following questions.

1. What are the names, origins, insertions and nerve supplies of the superficial plantar flexor muscles? (10 marks)
2. What are the functions of the “Spring” ligament? (2 marks)
3. Which bones form the Subtalar joint? (2 marks)
4. State the origin and insertion of the Semitendinosus muscle. (4 marks)
5. Describe the course and functions of the superficial peroneal nerve. (4 marks)
6. List and describe the ligaments of the hip joint. How do these ligaments help to achieve stability around the joint? (12 marks)
7. Name the main muscles responsible for extension of the hip? (4 marks)
8. Name three muscles which originate from the posterior tibia. (3 marks)
9. Name the three main muscles which a**b**duct the hip. (3 marks)
10. What are the functions of the retinaculae of the ankle? (2 marks)
11. Briefly summarise the structure and function of the acetabular labrum. (4 marks)

**SECTION TWO** - Answer **ALL** of the following questions. Write your answers on the multiple choice answer sheet, writing only one letter as the answer to each question. **All** questions are worth **one** mark for the correct answer.

1. Which of these is not a landmark on the innominate bone?

a) Lesser Sciatic notch

b) Illiac crest

c) Greater Sciatic Notch

d) Linea Aspera

1. Which of the following bony landmarks cannot be palpated?

a) ASIS

b) AIIS

c) PSIS

d) Pubic Tubercle

1. Where would you find the greater trochanter of the femur?

a) On the lateral side, towards the distal end.

b) On the lateral side, towards the proximal end.

c) On the medial side, towards the distal end.

d) On the medial side, towards the proximal end.

1. Which of these is the most posterior boney landmark on the femur?

a) Linea Aspera

b) Intertrochanteric Line

c) Soleal Line

d) Supra Condylar Line

1. Which of the following is a correct list of the extra-capsular ligaments of the hip joint?

a) Iliofemoral ligament, pubofemoral ligament, inferior femoral ligament

b) Iliopubic ligament, pubofemoral ligament, ischiofemoral ligament

c) Iliofemoral ligament, iliopubic ligament, ligamentum teres

d) Iliofemoral ligament, pubofemoral ligament, ischiofemoral ligament

1. Which of these structures is extracapsular?

a) Acetabular labrum

b) Iliofemoral ligament

c) Ligamentum teres

d) Hyaline cartilage

1. Which statement is true in relation to the central acetabular fossa?

a) It is non-articular, and contains a fat pad

b) It is covered in hyaline cartilage, and contains a fat pad

c) It is non-articular, and contains the acetabular labrum

d) It is covered in hyaline cartilage, and contains the iliofemoral ligament

1. Which of these muscles does not contribute to hip flexion?

a) Psoas Major

b) Obturator Internus

c) Pectineus

d) Iliacus

1. Which bony landmark is the insertion point of the Gluteus Minimus?

a) Greater trochanter

b) Gluteal tuberosity

c) Intertrochanteric crest

d) Pectineal line

1. Which muscle group has its origins on the pubic ramus of the pelvis?

a) Adductors

b) Hamstrings

c) Knee extensors

d) Quadriceps

1. Which of these muscles is supplied by the femoral nerve?

a) Adductor Brevis

b) Adductor Longus

c) Gracilis

d) Sartorius

1. What are the classifications of the superior and inferior tibiofibular joints?

a) Superior: Synovial plane joint. Inferior: Syndesmosis joint.

b) Both synovial plane joints

c) Superior: Syndesmosis joint. Inferior: Synovial plane joint.

d) Superior: Synovial hinge joint. Inferior: Synovial plane joint.

1. Which of these is an attachment for the Anterior Talofibular ligament?

a) Medial malleolus

b) Lateral malleolus

c) Lateral condyle

d) Medial condyle

14. Which of the following is not a feature of the fibula bone?

a) Head

b) Malleolus

c) Interosseous border

d) Medial condyle

1. Which of these is the bony insertion for the quadriceps muscle group?

a) Ischial tuberosity

b) Lesser trochanter

c) Soleal line

d) Tibial tuberosity

1. Which of these is not a bursa of the knee?

a) Deep Infrapatellar bursa

b) Prepatellar bursa

c) Subacromial bursa

d) Superficial Infrapatellar bursa

1. The Anterior Cruciate Ligament and Posterior Cruciate Ligament are:

a) Extra-synovial and intra-capsular

b) Intra-synovial and extra-capsular

c) Both a and b

d) Neither a nor b

1. Which statement about the knee joint is not true?

a) The patellar retinaculum attaches to the sides of the quadriceps tendon, patella,

and patellar ligament.

b) The knee joint capsule is replaced anteriorly by the knee extensor mechanism,

patella and patella tendon/ligament.

c) The knee joint capsule is replaced posteriorly by a fat pad.

d) The synovial membrane includes medial and lateral alar folds, either side of the

patella.

1. Which other muscle attaches at the “Pes Anserine insertion”, along with Semitendinosis & Sartorious?

a) Semimembranosis

b) Vastus medialis

c) Gracilis

d) Iliotibial band

1. Which muscle from the Quadriceps group crosses two joints?

a) Vastus intermedialis

b) Vastus medialis

c) Rectus Femoris

d) Vastus lateralis

1. What is the common origin point for the hamstring muscle group?

a) Inferior Pubic Ramus

b) Ischial Tuberosity

c) Ischial spine

d) Pubic tubercle

1. Where is the origin of the short head of Biceps Femoris?

a) Lower half of the linea aspera

b) Medial epicondyle of the tibia

c) Lesser trochanter

d) Gluteal tuberosity

1. Which of the following correctly describes the location of the sustentaculum tali?

a) Medial aspect of calcaneus, inferior to medial malleolus

b) Lateral aspect of foot, proximal to medial cuneiform

c) Lateral aspect of calcaneus, inferior to lateral malleolus

d) Lateral aspect of talus, superior to calcaneus

1. When does the “Windlass Mechanism” occur in the foot?

a) When the toes plantarflex, as the sole of the foot touches the floor in gait.

b) When the ankle dorsiflexes.

c) When the toes dorsiflex, when the heal lifts off the floor in gait.

d) When the ankle plantarflexes.

1. Which of these is the most lateral bone in the foot?

a) Intermediate cuneiform

b) Navicular

c) Medial cuneiform

d) Cuboid

1. Which statement about the talocrural joint is not true?

a) It has two sets of collateral ligaments.

b) It is classified as a synovial hinge joint.

c) Movement primarily occurs in the frontal plane.

d) It has a joint capsule.

1. Which of these ligaments do not contribute to limiting inversion of the ankle?

a) Anterior Talofibular

b) Calcaneofibular

c) Posterior Talofibular

d) Bifurcate

1. Which statement about the subtalar joint is not true?

a) Inversion and eversion occur at the subtalar joint

b) It is a synovial joint

c) Its ligamentous support includes the cervical ligament.

d) Anatomically, it includes the calcaneocuboid joint

1. Which statement is not true?

a) Plantarflexion and dorsiflexion are the principal movements at the ankle joint.

b) Plantarflexion and dorsiflexion primarily occur at the subtalar joint.

c) The calcaneocuboid joint is part of the mid-tarsal joint.

d) The talocalcaneonavicular joint is part of the mid-tarsal joint.

30. Which of the following muscles everts and weakly plantarflexes the foot?

a) Tibialis Posterior

b) Plantaris

c) Peroneus Brevis

d) Soleus

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Which muscle is not a plantarflexor of the ankle?

a) Gastrocnemius

b) Tibialis Anterior

c) Flexor Hallucis Longus

d) Tibialis Posterior

1. Which lower leg muscle originates on the femoral condyles?

a) Gastrocnemius

b) Soleus

c) Extensor Digitorum Longus

d) Flexor Digitorum Longus

1. Which muscle is not innervated by the Tibial nerve?

a) Flexor Hallucis Longus

b) Gastrocnemius

c) Tibialis Posterior

d) Extensor Digitorum Longus

1. Which of the following is not a border of the popliteal fossa?

a) Biceps femoris

b) Semimembranosus

c) Gastrocnemius

d) Soleus

1. Which nerve supplies the muscles and skin of the medial thigh?

a) Femoral

b) Obturator

c) Sciatic

d) Tibial

1. Which artery becomes the dorsalis pedis at the ankle?

a) Popliteal

b) Femoral

c) Anterior Tibial

d) Posterior Tibial

1. Which statement best describes eccentric muscle action?
2. As the muscle lengthens, it activates to decelerate this lengthening and slow

down movement at the relevant joint.

b) As the muscle shortens, it activates to accelerate this lengthening and speed up

movement at the relevant joint.

c) The muscle activates, but it does not lengthen or shorten.

d) The muscle does not activate, but lengthens due to shortening of the opposing

muscle group.

1. During striking a football, the roles of the hamstrings are…..

a) The agonist

b) The antagonist

c) The fixator

d) The synergist

1. What is an open kinetic chain activity?

a) Distal segment of the limb is fixed or restricted from movement.

b) Distal segment of the limb is fixed and not restricted from movement.

c) Distal segment of the limb is not fixed or restricted from movement.

d) Distal segment shows lower shear forces.

1. Which of the following is an open kinetic chain exercise for the lower limb?

a) Seated leg extension

b) Back squat

c) Split squat

d) Romanian dead lift

1. What type of muscle activation is occurring in the quadriceps muscle group during the lowering phase of the leg extension exercise?

a) Concentric

b) Isometric

c) Eccentric

d) Quasi Isometric

1. During a supine straight leg raise, what are the predominant muscles responsible for the eccentric phase of the movement?

a) TFL, Pectineus, Gracillis

b) Illiacus, Psoas Major, Sartorius, Rectus Femoris

c) Semimembranosus, Semitendinosus, Biceps Femoris

d) Vastus Medialis, Vastus Lateralis, Glute Maximus

1. Which part of walking gait is not closed kinetic chain for the lower limb?

a) Terminal Stance

b) Pre Swing

c) Loading Response

d) Initial Swing

1. Which of these is not typical of closed kinetic chain exercise?

a) Involves multiple links of the kinetic chain

b) Isolates a single muscle or a single plane of motion

c) A force applied to one segment produces movement at all other segments in a

predicable fashion

d) Leads to establishment of early proximal stability

1. What type of muscle activation is occurring in the quadriceps muscle group during the upward phase of the back squat exercise?

a) Concentric

b) Isometric

c) Eccentric

d) Quasi Isometric

1. Which activity is not closed kinetic chain for the lower limb?

a) Cable knee extension

b) Squat

c) Weighted calf raise

d) Pushing off the wall during a turn in a swimming stoke

1. One gait cycle is defined as:

a) Initial contact of one limb to the initial contact of the opposite limb.

b) Initial contact of one limb and the successive contact of the opposing limb.

c) Initial contact of one limb and the successive contact of the same limb.

d) None of the above.

1. Which of the following help maintain pelvic neutral in the frontal plane during gait?

a) Action of hip abductors on stance limb

b) Action of hip abductors on swing limb

c) Action of hip Flexors on stance limb

d) Action of hip flexors on swing limb

1. Which statement about the ‘Loading Response’ phase is not correct?

a) 2-10% of the gait cycle.

b) Initial double stance period.

c) Next phase after it is terminal stance.

d) Continues until other foot is lifted for swing.

1. Flexed posture of the knee during stance:

a) Is a common symptom following knee surgery.

b) Usually corresponds to a lack of knee extension during swing.

c) Usually associated with an increase in hip Flexion and ankle DF during gait.

d) all of the above

**END OF EXAMINATION**

**Multiple Choice Answer Sheet**

**Your Regnum: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Write your Regnum on this sheet, and your answers in the boxes below.**

**Write only one letter as the answer to each question. Place your completed Multiple Choice Answer Sheet inside the front cover of your answer book.**

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