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# Human Anatomy — Biology 351

## Lower Limb

Please place your name on the back of the last page of this exam. You must answer *all* questions on this exam. Because statistics demonstrate that, on average, between 2-5 questions on every 100-point exam are ambiguous enough to come out "aberrant" on an item analysis, the total number of points possible on this exam is 106. However, grades will be calculated out of a possible 100 points, assuming that 2–3 questions on this exam are aberrant.

***Final exams are NOT returned. If you want to see how you did on the final you need to come see me during the first week of fall term. At the end of the day on Friday of the first week all final exams will be shredded.***

**Section 1: Gluteal and posterior muscles of the thigh.** Place the most appropriate answer in the space provided. ***Note that, in many questions, the choices ARE NOT IN ALPHABETICAL ORDER!!***  
(2 points each)

- \_\_\_\_\_ 1. Origins on the iliac crest, ilium, sacrum, coccyx and thoracolumbar fascia best describes which of the following muscles?
- biceps femoris short head
  - biceps femoris long head
  - semimembranosus
  - semitendinosus
  - tensor fascia latae
  - gluteus maximus
  - gluteus medius
  - gluteus minimus
- \_\_\_\_\_ 2. An origin on the iliac crest and the anterior, superior, iliac spine, insertion onto the iliotibial tract, actions of medial rotation and abduction of the hip, extension and stabilization of the knee, and innervation by the superior gluteal nerve best describes which of the following muscles?
- biceps femoris short head
  - biceps femoris long head
  - semimembranosus
  - semitendinosus
  - tensor fascia latae
  - gluteus maximus
  - gluteus medius
  - gluteus minimus

- \_\_\_\_\_ 3. The deepest muscles of this group that has an origin on the ilium, insertion onto the greater trochanter of the femur, innervation by the superior gluteal nerve, and actions of abduction and medial rotation of the thigh at the hip best describes which of the following muscles?
- biceps femoris short head
  - biceps femoris long head
  - semimembranosus
  - semitendinosus
  - tensor fascia latae
  - gluteus maximus
  - gluteus medius
  - gluteus minimus
- \_\_\_\_\_ 4. An origin on the linea aspera of the femur, actions of flexing the leg at the knee, and innervation by the common fibular nerve best describes which of the following structures?
- biceps femoris short head
  - biceps femoris long head
  - semimembranosus
  - semitendinosus
  - tensor fascia latae
  - gluteus maximus
  - gluteus medius
  - gluteus minimus

**Section 2: Muscles of the leg.** If the following statements are true place a (+) in the space provided; if the following statements are false place a (O) in the space provided. (2 points each)

- \_\_\_\_\_ 5. The fibularis longus inserts onto the lateral cuneiform of the foot.
- \_\_\_\_\_ 6. The fibularis brevis inserts onto the 5<sup>th</sup> metatarsal on the plantar surface of the foot.
- \_\_\_\_\_ 7. The soleus originates from the tibia and fibula.
- \_\_\_\_\_ 8. The popliteus is innervated by the tibial nerve.
- \_\_\_\_\_ 9. The popliteus originates from the medial condyle of the femur.
- \_\_\_\_\_ 10. The flexor digitorum longus has an origin on the tibia.
- \_\_\_\_\_ 11. The tibialis posterior has an origin on the tibia.
- \_\_\_\_\_ 12. The tibialis posterior has an insertion on the talus.
- \_\_\_\_\_ 13. All of the muscles in the anterior compartment of the leg dorsiflex and invert the foot.
- \_\_\_\_\_ 14. Both of the muscles of the lateral compartment of the leg insert onto anatomical structures on the sole (plantar) surface of the foot.
- \_\_\_\_\_ 15. The flexor hallucis longus has an origin on the tibia.

- \_\_\_\_\_ 16. The tibialis posterior has an origin on the interosseous membrane.
- \_\_\_\_\_ 17. The medial and lateral heads of the gastrocnemius originate from the medial and lateral epicondyles of the femur respectively.
- \_\_\_\_\_ 18. The gastrocnemius is innervated by the superficial fibular nerve.
- \_\_\_\_\_ 19. All of the muscles in the anterior compartment of the leg are innervated by the fibular nerve.
- \_\_\_\_\_ 20. The gastrocnemius plantar flexes the foot and flexes the leg at the knee.
- \_\_\_\_\_ 21. The extensor digitorum (longus) originates from the tibia and the fibula.
- \_\_\_\_\_ 2. The plantaris plantar flexes the foot and extends the leg at the knee.
- \_\_\_\_\_ 23. The flexor digitorum longus has an origin on the interosseous membrane.
- \_\_\_\_\_ 24. The extensor hallucis longus originates from the tibia.
- \_\_\_\_\_ 25. The infracondylar line (ridge) is one of the origins of the plantaris muscle.
- \_\_\_\_\_ 26. The flexor hallicus longus has an origin on the interosseous membrane.
- \_\_\_\_\_ 27. Relax, and collect two points by drawing the *niciest picture* of your anatomy professor in the space below.

**Section 3: Anterior and adductor muscles of the thigh.** Place the most appropriate answer in the space provided. Note that, in many questions, the choices ARE NOT IN ALPHABETICAL ORDER!!  
(2 points each)

- \_\_\_\_\_ 28. If you were to consider the *general* characteristics of the adductor muscles of the thigh you would know that
- the adductor muscles' general actions are adduction, flexion and lateral rotation of the thigh at the hip, and that these muscles are innervated by the obturator nerve.
  - the adductor muscles' general actions are adduction, flexion, and lateral rotation of the thigh at the hip, and that these muscles are innervated by the femoral nerve.
  - the adductor muscles' general actions are adduction, flexion, and medial rotation of the thigh at the hip, and that these muscles are innervated by the obturator nerve.
  - the adductor muscles' general actions are adduction, flexion, and lateral rotation of the thigh at the hip, and that these muscles are innervated by the femoral nerve.
  - the adductor muscles' general actions are adduction, flexion, and medial rotation of the thigh at the hip, and that these muscles are innervated by the femoral nerve.
- \_\_\_\_\_ 29. If you were to consider the *general* characteristics of the anterior muscles of the thigh you would know that
- the anterior muscles' general actions are to flex the thigh at the hips and extend the leg at the knee, and that these muscles are innervated by the obturator nerve.
  - the anterior muscles' general actions are to flex the thigh at the hips and extend the leg at the knee, and that these muscles are innervated by the sciatic nerve.
  - the anterior muscles' general actions are to flex the thigh at the hips and extend the leg at the knee, and that these muscles are innervated by the femoral nerve.
  - the anterior muscles' general actions are to flex the thigh at the hips and extend the leg at the knee, and that these muscles are innervated by the tibial nerve.
  - the anterior muscles' general actions are to flex the thigh at the hips and extend the leg at the knee, and that these muscles are innervated by the fibular nerve.
- \_\_\_\_\_ 30. A muscle with origins on the anterior, inferior iliac spine and superior rim of the acetabulum, insertion onto the tibial tuberosity by the patellar tendon and ligament, and actions of extending the leg at the knee, and flexing the thigh at the hip best describes which of the following muscles?
- psoas major
  - iliacus
  - sartorius
  - gracilis
  - rectus femoris
  - vastus intermedius
  - vastus medialis
  - vastus lateralis
  - adductor longus
  - adductor brevis
  - adductor magnus

- \_\_\_\_\_ 31. A muscle with its origin on the anterior, superior iliac spine, insertion onto the medial surface of the tibia, and actions of flexion, abduction and lateral rotation of the thigh at the hip and flexion of the leg at the knee best describes which of the following muscles?
- psoas major
  - iliacus
  - sartorius
  - gracilis
  - rectus femoris
  - vastus intermedius
  - vastus medialis
  - vastus lateralis
  - adductor longus
  - adductor brevis
  - adductor magnus
- \_\_\_\_\_ 32. The gracilis has what origins, insertions and actions?
- origin on the superior pubic ramus, insertion onto the fibula, and actions of flexing and medially rotating the leg at the knee and adducting and medially rotating the thigh at the hip.
  - origin on the superior pubic ramus, insertion onto the tibia, and actions of flexing and medially rotating the leg at the knee and adducting and medially rotating the thigh at the hip.
  - origin on the inferior pubic ramus, insertion onto the fibula, and actions of flexing and medially rotating the leg at the knee and adducting and medially rotating the thigh at the hip.
  - origin on the inferior pubic ramus, insertion onto the fibula, and actions of flexing and medially rotating the leg at the knee and adducting and laterally rotating the thigh at the hip.
- \_\_\_\_\_ 33. A superficial muscle with an origin on the inferior pubic ramus, insertion onto the linea aspera of the femur, actions of adduction, flexion and medial rotation of the thigh at the hip, and innervation by the obturator nerve best describes which of the following muscles?
- psoas major
  - iliacus
  - sartorius
  - gracilis
  - rectus femoris
  - vastus intermedius
  - vastus medialis
  - vastus lateralis
  - adductor longus
  - adductor brevis
  - adductor magnus

- \_\_\_\_\_ 34. An origin on vertebrae T<sub>12</sub> to L<sub>5</sub>, insertion onto the lesser trochanter of the femur, innervation by the femoral nerve, and actions of flexing the thigh at the hip (when acting from below) best describes which of the following muscles?
- psoas major
  - iliacus
  - sartorius
  - gracilis
  - rectus femoris
  - vastus intermedius
  - vastus medialis
  - vastus lateralis
  - adductor longus
  - adductor brevis
  - adductor magnus
- \_\_\_\_\_ 35. A deep muscle with an origin on the inferior pubic ramus, insertion onto the linea aspera of the femur, actions of adduction, flexion and medial rotation of the thigh at the hip, and innervation by the obturator nerve best describes which of the following muscles?
- psoas major
  - iliacus
  - sartorius
  - gracilis
  - rectus femoris
  - vastus intermedius
  - vastus medialis
  - vastus lateralis
  - adductor longus
  - adductor brevis
  - adductor magnus

**Section 4: Short answer.**

36. In the space below tell me what was the most important thing you learned in this class this term, **and it can't be course content material — it has to be of a personal nature!** (6 points)

**Section 5: Muscle Identification.** On the next page is a cross section of a middle portion of the thigh. If a muscle on the following page is labeled place the proper letter in the appropriate space. However, *if a muscle is not labeled place XX in the space provided. (Note the labeling of medial and anterior.)* (2 points each)

- \_\_\_\_\_ 37. Biceps femoris, short head
- \_\_\_\_\_ 38. Vastus lateralis
- \_\_\_\_\_ 39. Semitendinosus
- \_\_\_\_\_ 40. Sartorius
- \_\_\_\_\_ 41. Semimembranosus
- \_\_\_\_\_ 42. Adductor brevis
- \_\_\_\_\_ 43. Adductor longus

**Section 6: Muscle Identification.** On the next page is a cross section of the leg. If a muscle on the following page is labeled place the proper number in the appropriate space. However, *if a muscle is not labeled place XX in the space provided.* (Note the labeling of medial and anterior.) (2 points each)

- \_\_\_\_\_ 44. Flexor digitorum longus
- \_\_\_\_\_ 45. Fibularis longus
- \_\_\_\_\_ 46. Tibialis anterior
- \_\_\_\_\_ 47. Extensor digitorum longus
- \_\_\_\_\_ 48. Fibularis brevis
- \_\_\_\_\_ 49. Flexor hallicus longus
- \_\_\_\_\_ 50. Tibialis posterior
- \_\_\_\_\_ 51. Extensor hallucis longus