

Human Anatomy — Biology 255

Exam #4

Please place your name and I.D. number 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 105. However, grades will be calculated out of a possible 100 points, assuming that 2—3 questions on this exam are aberrant.

NOTE: Unless otherwise stated in the question all aspects of a muscle (origin, insertion, action, innervation) must be mentioned in the question and must be correct to make that a correct choice for any question on this exam! (Unless mentioned, do not worry about whether the action is weak, primary etc.)

Section 1: Multiple Choice Questions Dealing with the Gluteal Region and the Anterior Thigh Musculature. Place the most appropriate letter in the space provided. (2 points each)

- _____ 1. Today is Emily's birthday, and Nicole and Tim have birthdays coming up in November. So, draw your best picture of a birthday cake in the space provided and collect 5 free points in honor of Emily's, Nicole's, Tim's birthdays *as well as anyone else that had a birthday this term!*
- _____ 2. Origin(s) on the transverse processes of vertebrae T₁₂ to L₅, insertion(s) on the greater trochanter of the femur, action(s) of flexing the thigh at the hip, and innervation by the femoral nerve best describes which of the following muscles?
- psoas major
 - iliacus
 - vastus intermedius
 - rectus femoris
 - vastus lateralis
 - vastus medialis
 - sartorius
 - more than one of the above
 - all of the above
 - none of the above

- _____ 3. Origin(s) on the ilium, insertion(s) onto the lesser trochanter of the femur, action(s) of flexing the thigh at the hip, and an innervation by the femoral nerve describes which of the following muscles?
- psoas major
 - iliacus
 - vastus intermedius
 - rectus femoris
 - vastus lateralis
 - vastus medialis
 - sartorius
 - more than one of the above
 - all of the above
 - none of the above
- _____ 4. Origin(s) on the anterior, inferior iliac spine, insertion(s) on the tibia, innervation by the femoral nerve, and actions of flexion, lateral rotation and abduction of the thigh at the hip and flexion of the leg at the knee describes which of the following muscles?
- psoas major
 - iliacus
 - vastus intermedius
 - rectus femoris
 - vastus lateralis
 - vastus medialis
 - sartorius
 - more than one of the above
 - all of the above
 - none of the above
- _____ 5. Which of the follow muscles crosses two or more joints?
- psoas major
 - iliacus
 - vastus intermedius
 - rectus femoris
 - vastus lateralis
 - vastus medialis
 - sartorius
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above

- _____ 6. Which of the following muscles is *not* innervated by the femoral nerve?
- psoas major
 - iliacus
 - vastus intermedius
 - rectus femoris
 - vastus lateralis
 - vastus medialis
 - sartorius
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above (in other words, they are all innervated by the femoral nerve)
- _____ 7. Which of the following muscles has an origin on the coccyx?
- gluteus maximus
 - gluteus medius
 - gluteus minimus
 - tensor fascia latae
 - two of the above
 - three of the above
 - all of the above
 - none of the above
- _____ 8. Which of the following muscles has an origin on the ilium?
- gluteus maximus
 - gluteus medius
 - gluteus minimus
 - tensor fascia latae
 - two of the above
 - three of the above
 - all of the above
 - none of the above
- _____ 9. Which of the following muscles is a lateral rotator of the thigh at the hip?
- gluteus maximus
 - gluteus medius
 - gluteus minimus
 - tensor fascia latae
 - two of the above
 - three of the above
 - all of the above
 - none of the above

- _____ 10. Which of the following muscles is a medial rotator of the thigh at the hip?
- a. gluteus maximus
 - b. gluteus medius
 - c. gluteus minimus
 - d. tensor fascia latae
 - e. two of the above
 - f. three of the above
 - g. all of the above
 - h. none of the above
- _____ 11. Origin(s) on the iliac crest and anterior, inferior iliac spine, insertion(s) on the iliotibial band, innervation by the superior gluteal nerve, and action(s) of medially rotating and abducting the thigh at the hip and stabilization of the knee as well as extension and lateral rotation of the leg at the knee best describes which of the following muscles?
- a. gluteus maximus
 - b. gluteus medius
 - c. gluteus minimus
 - d. tensor fascia latae
 - e. two of the above
 - f. three of the above
 - g. all of the above
 - h. none of the above
- _____ 12. Which of the following muscles is/are innervated by the inferior gluteal nerve?
- a. gluteus maximus
 - b. gluteus medius
 - c. gluteus minimus
 - d. tensor fascia latae
 - e. two of the above
 - f. three of the above
 - g. all of the above
 - h. none of the above

Section 2: True-False Questions Dealing with the Adductor and Posterior Thigh Musculature. If the following statements are true place a (+) in the space provided; if the statements are false place a (O) in the space provided.
(2 points each)

- _____ 13. The gracilis has only one origin, and it is on the pubic bone.
- _____ 14. The gracilis has several actions. *Two of these actions* are medial rotation of the leg at the knee and medial rotation of the thigh at the hip.

- _____ 15. The adductor longus, adductor brevis, and adductor magnus all have *at least one origin in common*, and that is an origin *somewhere* on the pubic bone.
- _____ 16. The adductor longus, adductor brevis, and adductor magnus all have *at least one insertion in common*, and that insertion is the linea aspera of the femur.
- _____ 17. The adductor longus, adductor brevis, and adductor magnus all have *at least one nerve in common*, and that nerve is the obturator nerve.
- _____ 18. The adductor magnus is innervated by two nerves. *One of those nerves* is the tibial nerve.
- _____ 19. The adductor longus, adductor brevis, and adductor magnus all have *at least one action in common*, and that action is flexion of the thigh at the hip.
- _____ 20. The gracilis crosses both the hip and knee joints. The *actions of the gracilis on the thigh at the hip* are abduction and medial rotation of the thigh at the hip.
- _____ 21. All of the hamstrings insert onto both the tibia and fibula.
- _____ 22. All of the hamstrings medially rotate the leg at the knee.
- _____ 23. The biceps femoris originates from the ischial tuberosity and the femur, inserts onto the tibia and fibula, and has actions of flexion and medial rotation of the leg at the knee and extension and lateral rotation of the thigh at the hip. The long head is innervated by the tibial nerve and the short head is innervated by the common fibular nerve.

Section 3: Multiple Choice Questions Dealing with the Musculature of the Anterior and Lateral Compartments of the Leg. Place the most appropriate letter in the space provided. (2 points each)

- _____ 24. A muscle with origin(s) on the tibia, fibula and the interosseous membrane, insertion(s) on the four lateral toes, an innervation by the deep fibular nerve, and action(s) of extension of the four lateral toes and dorsiflexion of the foot best describes which of the following muscles?
- tibialis anterior
 - extensor digitorum (longus)
 - extensor hallicus longus
 - fibularis longus
 - fibularis brevis
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above

- _____ 25. Origin(s) on the fibula, insertion(s) onto the 1st metatarsal and medial cuneiform, action(s) of eversion and plantar flexion of the foot, and an innervation by the deep fibular nerve best describes which of the following muscles?
- tibialis anterior
 - extensor digitorum (longus)
 - extensor hallicus longus
 - fibularis longus
 - fibularis brevis
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above
- _____ 26. Which of the following muscles is an everter of the foot?
- tibialis anterior
 - extensor digitorum (longus)
 - extensor hallicus longus
 - fibularis longus
 - fibularis brevis
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above
- _____ 27. Which of the following is an inverter of the foot?
- tibialis anterior
 - extensor digitorum (longus)
 - extensor hallicus longus
 - fibularis longus
 - fibularis brevis
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above

- _____ 28. Which of the following muscles has *at least one of its insertions* on the medial cuneiform of the foot?
- tibialis anterior
 - extensor digitorum (longus)
 - extensor hallicus longus
 - fibularis longus
 - fibularis brevis
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above
- _____ 29. Which of the following muscles has *at least one of its origins* on the interosseous membrane of the leg?
- tibialis anterior
 - extensor digitorum (longus)
 - extensor hallicus longus
 - fibularis longus
 - fibularis brevis
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above
- _____ 30. Which of the following muscles has *at least one of its actions* as dorsiflexion of the foot?
- tibialis anterior
 - extensor digitorum (longus)
 - extensor hallicus longus
 - fibularis longus
 - fibularis brevis
 - two of the above
 - three of the above
 - four of the above
 - all of the above
 - none of the above

Section 4: Multiple Choice Questions Dealing with the Musculature of the Posterior Compartment of the Leg. Place the most appropriate letter in the space provided. (2 points each)

- _____ 31. A muscle that has origin(s) on the femur, insertion(s) on the calcaneus, innervation by the tibial nerve, and action(s) of plantar flexion the foot and flexion of the leg at the knee best describes which of the following muscles?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallicus longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above
- _____ 32. Which of the following muscles has the capsule of the knee joint *as at least one of its origins*?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallicus longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above

- _____ 33. Which of the following has *as two of its origins* the tibia *and* fibula?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallicus longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above

- _____ 34. Which of the following inserts *onto at least one cuneiform bone*?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallicus longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above

- _____ 35. Which of the following has *as one of its actions* inversion of the foot?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallicus longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above
- _____ 36. Which of the following has *as one of its actions* eversion of the foot?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallicus longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above

- _____ 37. Which of the following muscles has *as one of its actions* flexion or rotation of the leg at the knee (*either or both*)?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallicus longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above
- _____ 38. Which of the following muscles has *as one of its insertions* an attachment onto one or more of the metatarsals of the foot?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallicus longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above

- _____ 39. Which of the following muscles has an attachment on the femur *as at least one of its origins*?
- a. gastrocnemius
 - b. soleus
 - c. plantaris
 - d. popliteus
 - e. flexor hallucis longus
 - f. flexor digitorum longus
 - g. tibialis posterior
 - h. two of the above
 - k. three of the above
 - l. four of the above
 - m. five of the above
 - o. all but one of the above
 - p. all of the above
 - q. none of the above

Section 5: Multiple Choice Questions Dealing with Agonist and Antagonistic Actions of Muscles. Place the most appropriate letter in the space provided. (2 points each)

- _____ 40. The tensor fascia latae has *as one of its actions* rotation of the thigh at the hip. Which of the following muscles would serve as an antagonist to this action of the tensor fascia latae?
- a. gluteus maximus
 - b. gluteus medius
 - c. gluteus minimus
 - d. sartorius
 - e. gracilis
 - f. more than one of the above
 - g. all of the above
 - h. none of the above
- _____ 41. The tibialis anterior inverts the foot. Which of the following muscles would be antagonistic to this action of the tibialis anterior?
- a. flexor digitorum (longus)
 - b. flexor hallucis longus
 - c. extensor digitorum longus
 - d. tibialis posterior
 - e. fibularis longus
 - f. fibularis brevis
 - g. more than one of the above
 - h. all but one of the above
 - i. none of the above

- _____ 42. The adductor longus is an adductor of the thigh at the hip. Which of the following muscles would be antagonistic to this action of the adductor longus?
- gracilis
 - gluteus maximus
 - gluteus medius
 - gluteus minimus
 - sartorius
 - all but one of the above
 - all but two of the above
 - all of the above
 - none of the above
- _____ 43. The hamstrings are the major extensors of the thigh at the hip. Which of the following muscles would be antagonistic to that action of the hamstrings?
- rectus femoris
 - vastus intermedius
 - vastus lateralis
 - vastus medialis
 - gluteus maximus
 - gluteus medius
 - gluteus minimus
 - more than one of the above
 - all of the above
 - none of the above
- _____ 44. The hamstrings are the major extensors of the thigh at the hip. Which of the following muscles would be antagonistic to that action of the hamstrings?
- gluteus maximus
 - gluteus medius
 - gluteus minimus
 - adductor magnus
 - adductor brevis
 - adductor longus
 - more than one of the above
 - all of the above
 - none of the above

Section 6: 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 LABELING OF ANTERIOR AND MEDIAL.) (2 points each)

- _____ 45. vastus lateralis
- _____ 46. long head of the biceps femoris
- _____ 47. sartorius
- _____ 48. rectus femoris

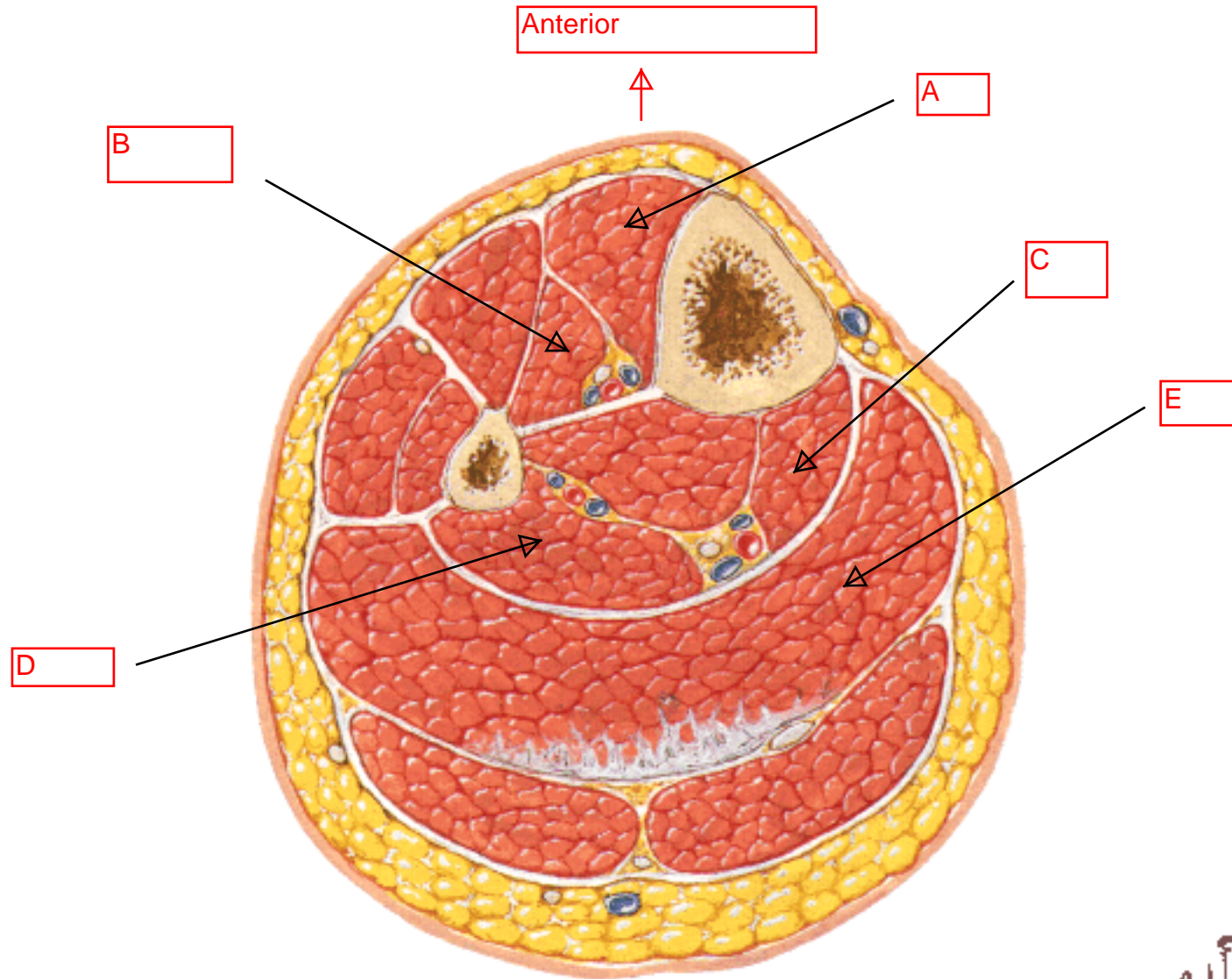
Section 7: Muscle Identification. On the next page is a cross section of the leg. If a muscle on the following page is labeled place the proper letter in the appropriate space. However, *if a muscle is not labeled place XX in the space provided.* (NOTE THAT MEDIAL AND LATERAL ARE DETERMINED BY THE BONES OF THE LEG, WHICH YOU SHOULD KNOW.) (2 points each)

- _____ 49. extensor digitorum (longus)
- _____ 50. tibialis posterior
- _____ 51. flexor digitorum longus

Plate Number
491B

Leg

Cross Section just above Middle of Left Leg



F. Netter
M.D.
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