

Graduate Anatomy
EXAMINATION 1

September 19, 2014

PART I. Answer in the space provided. (12 pts)

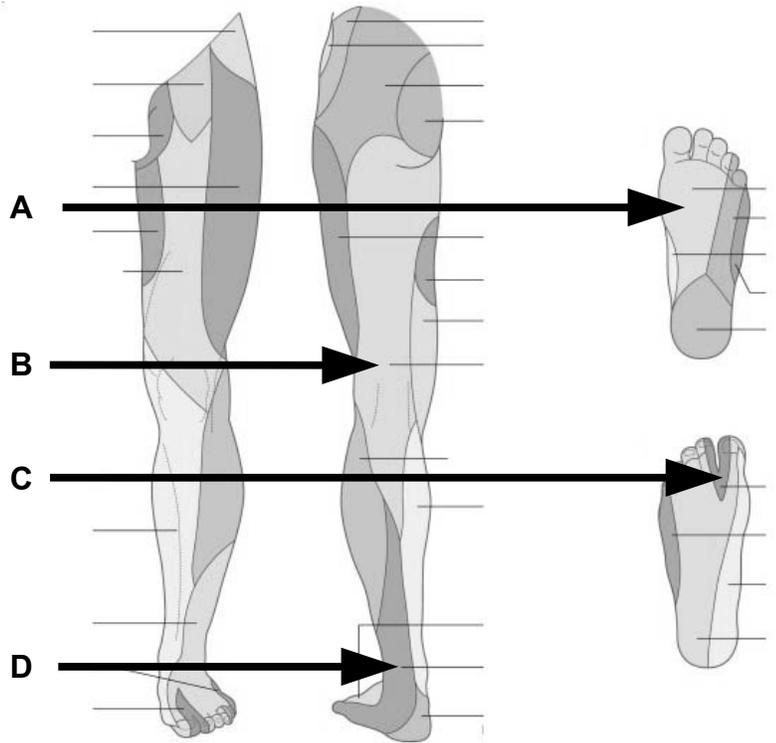
1. Identify the nerve distributions. (2 pts)

A. _____

B. _____

C. _____

D. _____



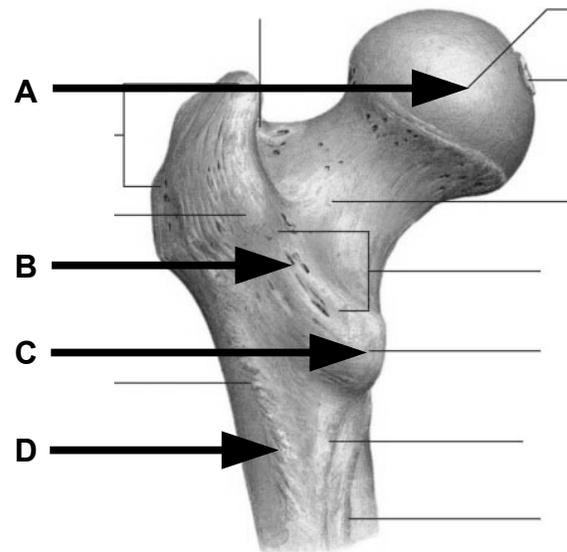
2. Identify the structures. (2 pts)

A. _____

B. _____

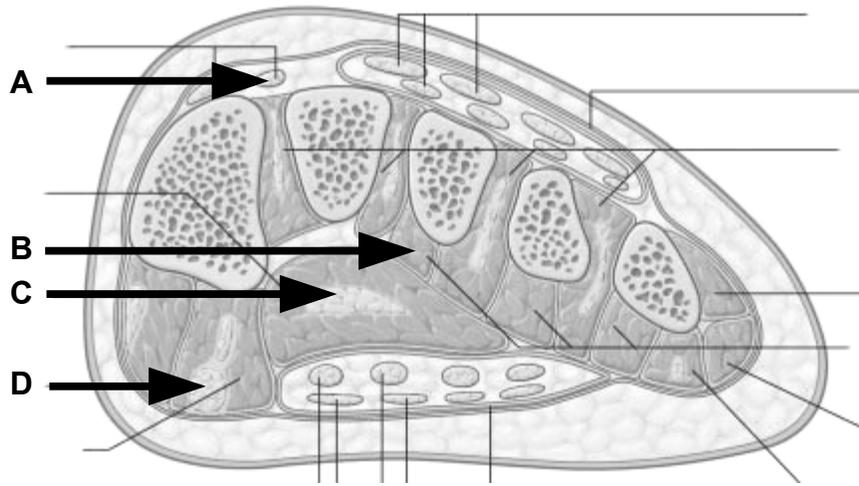
C. _____

D. _____



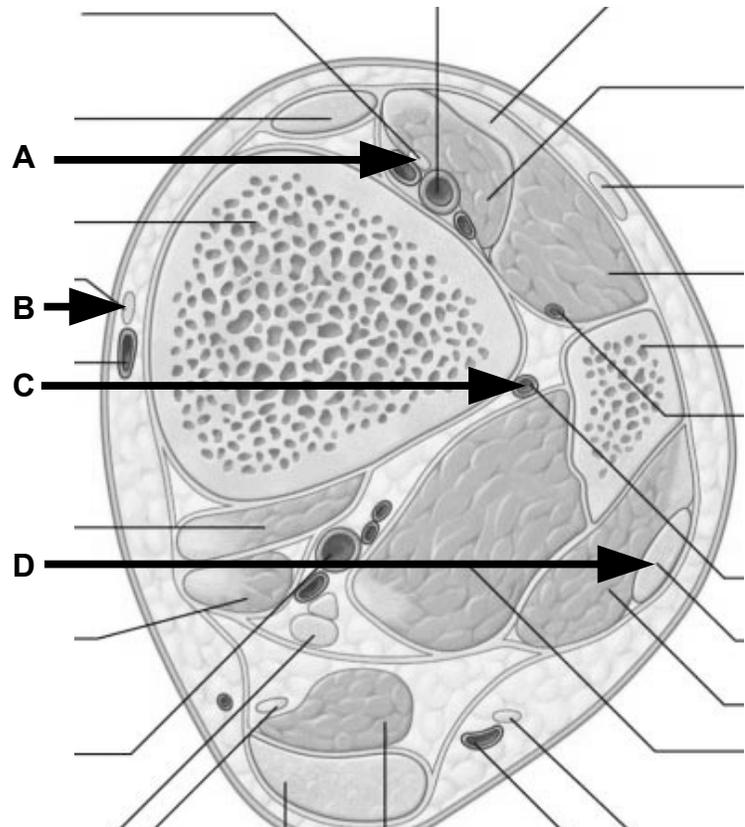
3. Identify the structures. (2 pts)

- A. _____
- B. _____
- C. _____
- D. _____



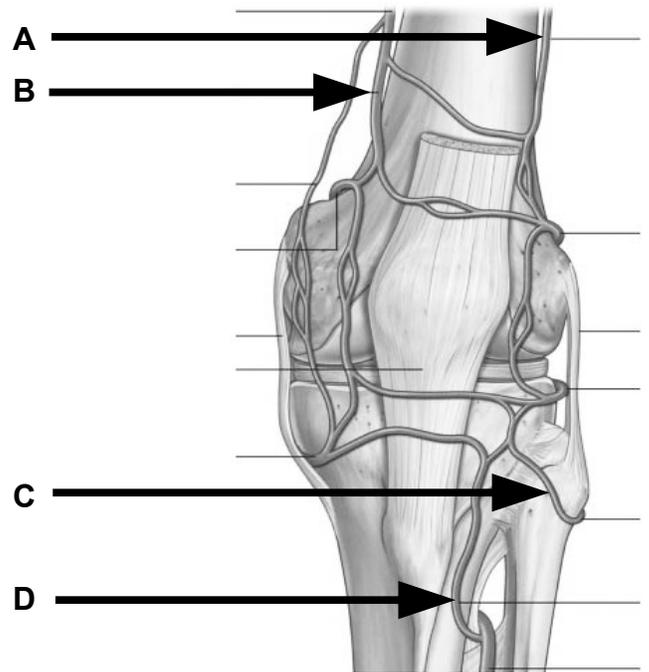
4. Identify the structures. (2 pts)

- A. _____
- B. _____
- C. _____
- D. _____



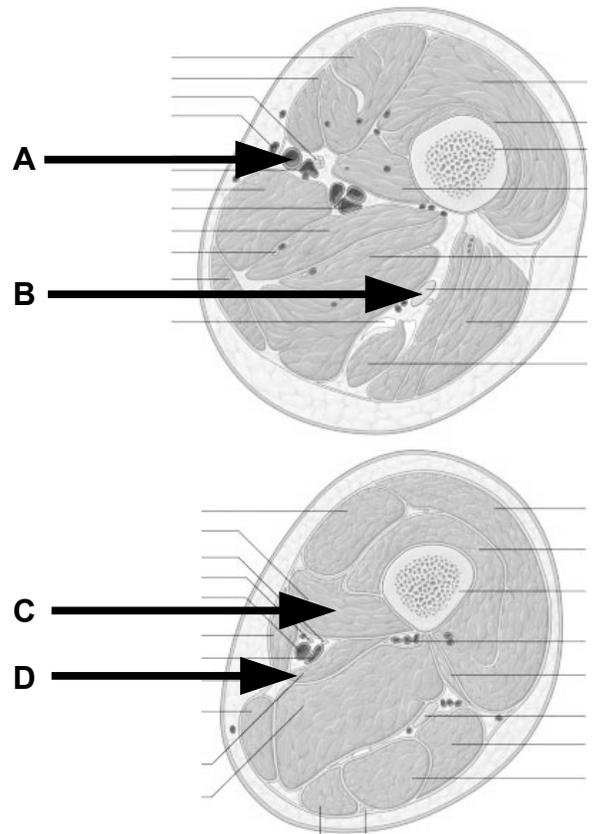
5. Identify the structures. (2 pts)

- A. _____
- B. _____
- C. _____
- D. _____



6. Identify the structures. (2 pts)

- A. _____
- B. _____
- C. _____
- D. _____



Part II. Circle the correct answer. All, none, or some may apply. (10 pts)

1. With regard to the thigh:
 - a. The medial compartment of the femoral sheath is surrounded on three sides by ligaments.
 - b. The falciform margin of the saphenous hiatus is directly anterior the femoral vein.
 - c. The posterior division of the obturator nerve passes along the anterior surface of the adductor brevis and the posterior surface of the adductor longus.
 - d. Within the adductor canal the femoral artery lies superficial to the femoral vein.
 - e. The saphenous nerve, but not the nerve to vastus medialis, passes through the adductor hiatus.
 - f. The tendons of the sartorius, gracilis, and semitendinosus muscles contribute to the formation of the pes anserinus.

3. With regard to the leg:
 - a. The interosseous membrane provides a posterior boundary to the anterior compartment of the leg.
 - b. Anterior compartment syndrome diminishes the dorsalis pedis pulse and disrupts cutaneous sensation between the second and third digit.
 - c. The deep peroneal nerve, but not the anterior tibial artery, is applied to the neck of the fibula as it enters the anterior compartment of the leg.
 - d. The flexor hallucis longus takes origin, in part, from the fibula.

4. With regard to the mediastinum and lungs:
 - a. The right posterior intercostal arteries cross the anterior margin of the vertebral bodies and pass deep to the thoracic sympathetic trunk.
 - b. The bifurcation of the trachea occurs at the T1 vertebral level.
 - c. The right superior intercostal vein is a branch of the accessory hemiazygos vein.
 - d. The thoracic duct receives lymphatic drainage from the left breast but not from the outer margin of the right breast.
 - e. The visceral pleura is innervated by visceral afferent fibers and parietal pleura is innervated by somatic afferent fibers.
 - f. A bronchopulmonary segment consists of a secondary bronchus, pulmonary vein, and lung tissue.

- g. The inferior border of the superior mediastinum is defined by a line from the sternal angle to the T4 vertebra.
- h. The vagus and phrenic nerves pass anterior to the hilum of the lung.
- i. The horizontal fissure of the right lung is at the level of the seventh rib.
- j. The lingula projects from the upper lobe of the left lung.

Part III. Indicate your understanding of the following. Answer in the space provided. (30 pts)

- 1. Discuss the structure and function of the of the tricuspid valve. (6 pts)**

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2. Discuss the structure and function (including blood flow to the coronary vessels) of the aortic semilunar valve. (6 pts)

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3. Coarctation (narrowing) of the aorta may cause elevated blood pressure of the upper extremity and decreased blood pressure of the lower extremity. **Describe the anatomical changes that accompany narrowing of the aorta at the level of the ligamentum arteriosum. Cite locations where the pattern of arterial blood flow is reversed from normal (retrograde flow). (6 pts)**

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4. Forced abduction and anterior displacement of the leg may injure three structures – the “unhappy triad.” **Discuss the anatomy of these injuries and their effect on the stability of the knee joint. (6 pts)**

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5. Entrapment of the lateral femoral cutaneous nerve (meralgia paresthetica) causes sensations of burning and numbness along the distribution of the nerve. **Discuss the anatomy of the lateral femoral cutaneous nerve. (6 pts)**

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Part IV. Essay. (48 pts)

1. An accumulation of fluid in the pericardial cavity may lead to cardiac tamponade and subsequent death. **Discuss the anatomy of the pericardial sac and cavity. Include an account of fascial layers, relationships, stabilization, vasculature, innervation, and lymphatic drainage. Describe how fluid may be withdrawn from the pericardial cavity (pericardiocentesis) without causing pneumothorax. (12 pts)**

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2. A 66 year old male is admitted to the general medicine ward service with respiratory failure that requires mechanical ventilation. In discussing the case, it is unclear if it is due to a disease process affecting the muscles of respiration or the nerves that innervate the various mechanisms involved in breathing. **Discuss the joints, muscles, and nerves that support the mechanics of respiration. Account for the expansion of the lung during inspiration. (12 pts)**

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3. A 25 year old male is the unrestrained driver of a motor vehicle involved in a high speed head on collision. His feet are impacted into the floor. X-rays of the right ankle taken in the Emergency Department reveal a displaced fracture of the calcaneus through the attachments of the calcaneofibular and tibiocalcaneal ligaments. **Review the anatomy of the medial region of the ankle. Include an account of the bones, joints, muscles, fascia, retinacula, nerves, and the medial longitudinal arch. (12 pts)**

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4. Incorrectly placed intragluteal injections may injure critical anatomical structures located superior to and inferior to the piriformis muscle. These injuries may cause permanent disability. **Discuss the anatomical relationships of the piriformis muscle. Describe the anatomical pathways of the superior gluteal nerve and the functional deficits and compensations(s) resulting from injury to this nerve. (12 pts)**

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