EXAM NUMBER_____

STRUCTURAL BASIS OF MEDICAL PRACTICE

EXAMINATION I

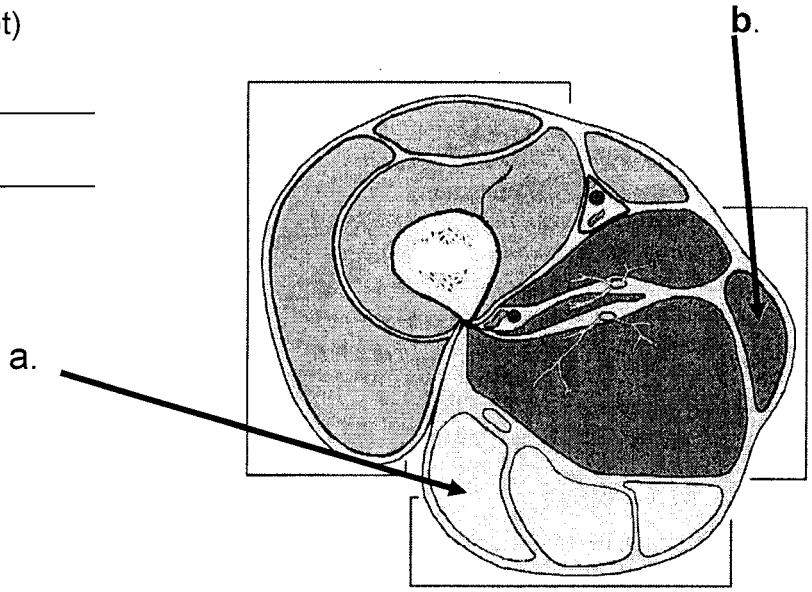
August 30, 2007

PART I. Answer in the space provided. (6 pts)

1. Identify the structures. (1 pt)

a._____

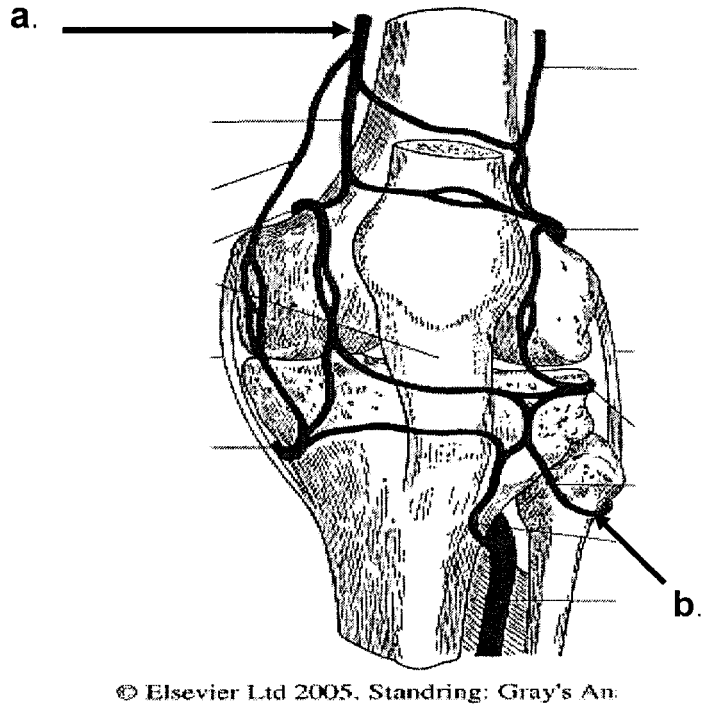
b._____



2. Identify the arteries. (1 pt)

a._____

b._____



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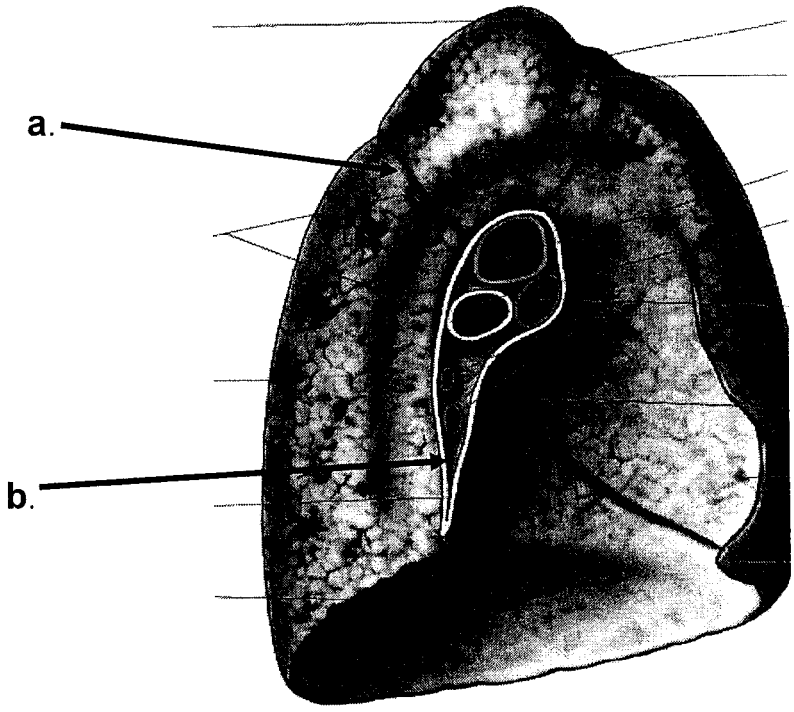
3. Identify the structures. (1 pt)

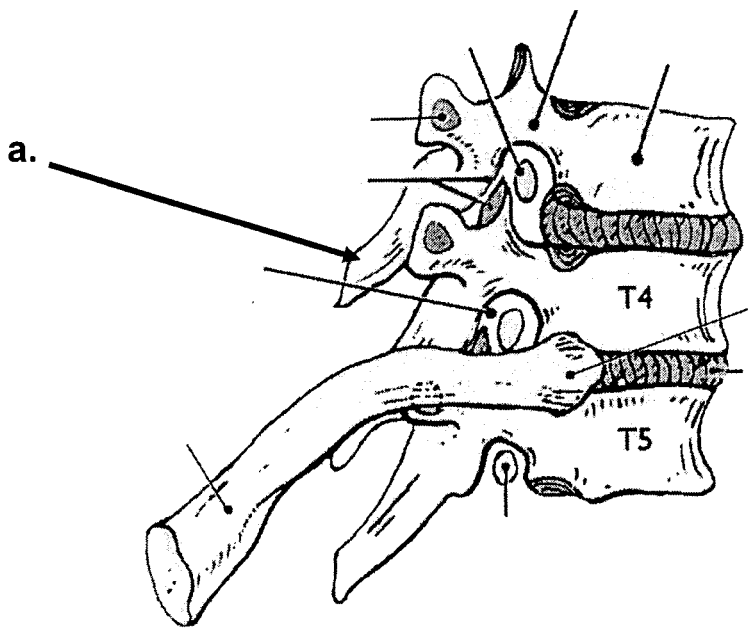
a._____

b._____



4. Identify the structures. (0.5 pt)

a._____



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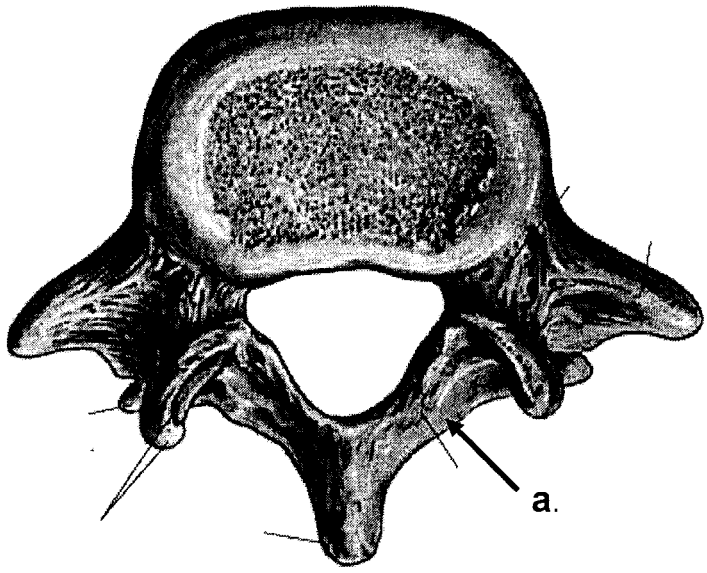
5. Identify the structure. (0.5 pt)

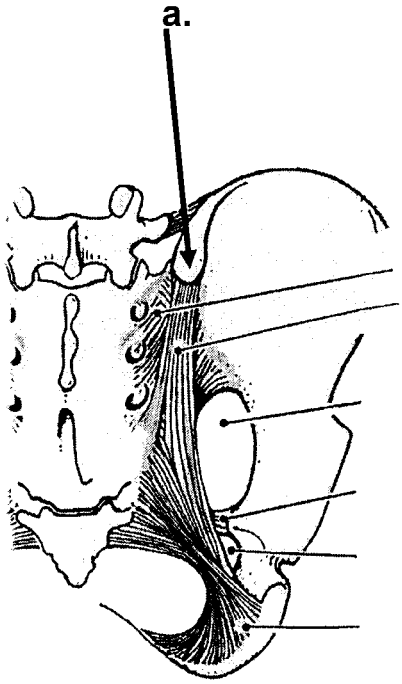
a._____

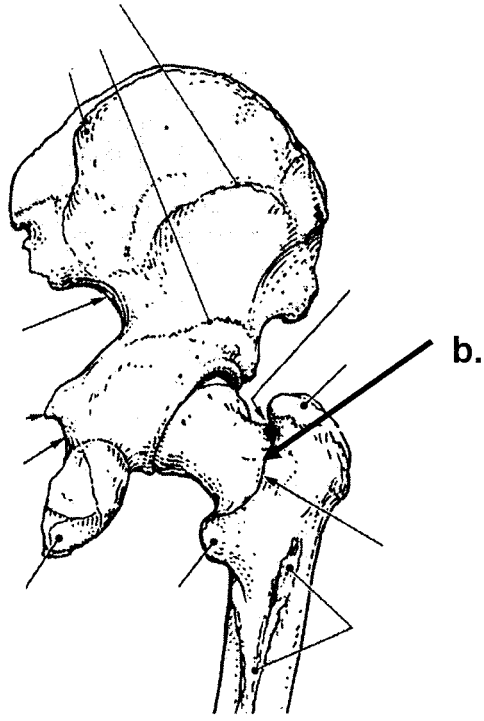


6. Identify the structures. (1 pt)

a._____

b._____

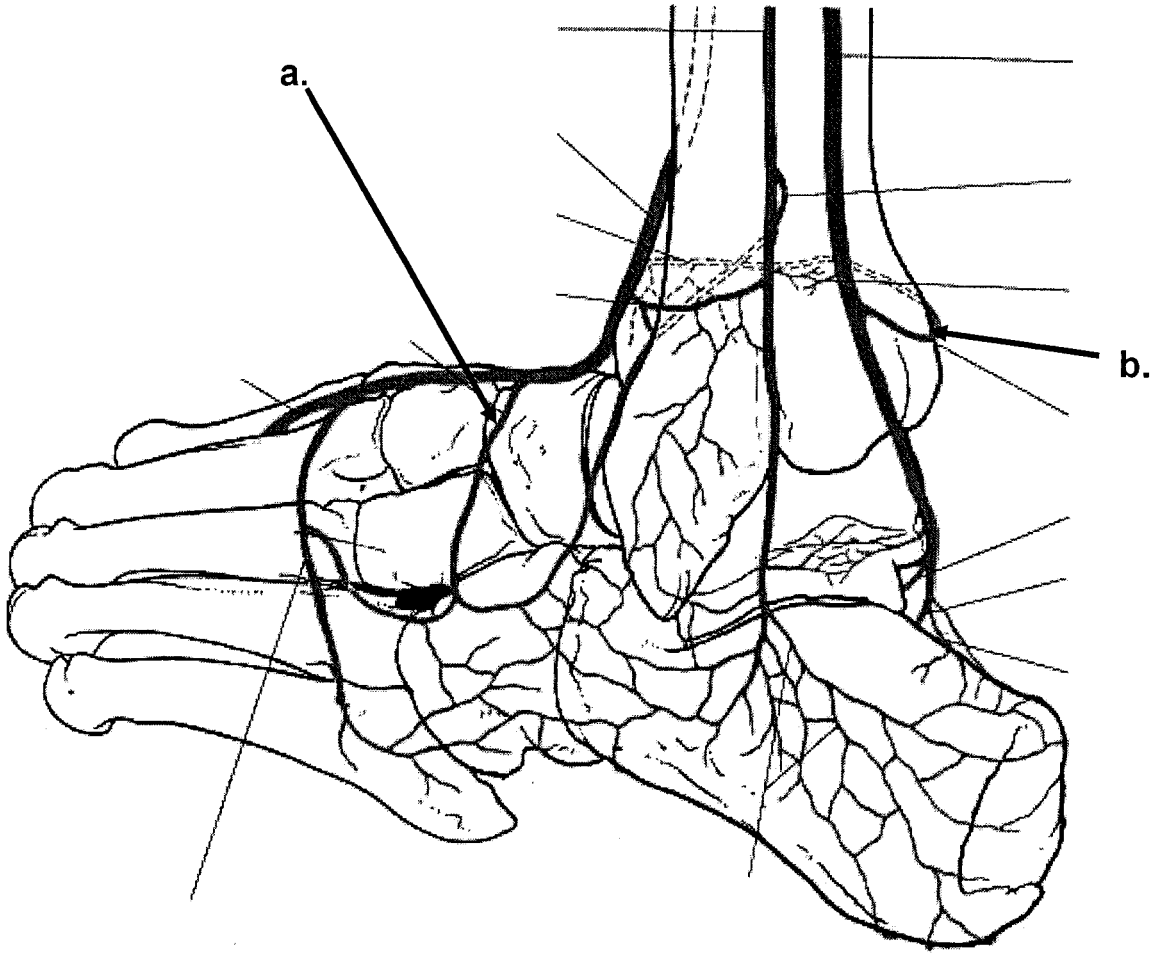




7. Identify the structures. (1 pt)

a._____

b._____



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Part II. Circle the correct answer. All, none, or some may apply. (38 pts)

1. With respect to the nervous system:

    a. Each and every spinal nerve contains a white rami communicans in order to transmit a pre-ganglionic sympathetic nerve.

    b. Parietal pleura has sensations of touch and temperature.

    c. The ventral root ganglion is a collection of cell bodies of efferent nerves.

    d. The diaphragm is an example of a skeletal muscle that is innervated by the somatic nervous system.

    e. The somatic efferents of the tibial nerve consist of pre- and post-ganglionic neurons.

    f. The parietal layer of the fibrous pericardium is innerved by the autonomic nervous system.

    g. Stimulation of the sympathetic nervous system vasodilates the right coronary artery.

    h. The superficial cardiac plexus contains preganglionic parasympathetic fibers.

    i. The lesser splanchnic nerve contains postganglionic sympathetic fibers.

    j. Visceral afferent neurons course through the dorsal root.

2. With regard to the subinguinal region:

    a. The femoral ring is located medial to the femoral vein.

    b. The lateral femoral circumflex artery passes posteriorly between the iliopsoas and pectineus muscles muscles.

    c. The 1st perforating branch of the deep femoral vein contributes to the cruciate anastomosis.

    d. The sartorius muscle arises from the anterior superior iliac spine.

    e. The inguinal ligament extends between the anterior superior iliac spine and the pubic tubercle.

    f. The cribriform fascia fills the saphenous opening and is derived from the tela subcutanea.

    g. The femoral sheath contains the saphenous nerve.

h. The falciform margin of the saphenous opening is composed of fascia lata.

i. The great saphenous artery gives rise to the superficial circumflex artery, superficial epigastric artery, and external pudendal artery.

j. The deep femoral vein joins the femoral vein inferior to the inguinal ligament.

3. With respect to the gluteal region:

a. The piriformis muscle courses through the greater sciatic foramen.

b. The obturator externus tendon courses through the lesser sciatic foramen.

c. Patients with a lesion (abnormality) of the right superior gluteal nerve often compensate while walking by leaning towards the right side.

d. The gluteus minimus is a medial rotator of the thigh.

e. The posterior femoral cutaneous nerve exits the pelvic cavity superior to the piriformis muscle.

f. Gluteal injections given in the upper inner quadrant could damage the internal pudendal nerve.

g. The lateral femoral cutaneous nerve gives rise to the inferior cluneal nerves.

h. A spinal tap should be performed at spinal cord levels S2.

i. The obturator externus is innervated by the obturator nerve.

j. In the male, the ischial spine points in a posteromedial direction.

4. With respect to the leg:

a. The peroneal artery is located on the fibular side of the leg.

b. The peroneus hallucis is a medial slip of the extensor hallucis longus.

c. The great and small saphenous vein are, in part, derived from the dorsal venous arch.

d. The lumbricals and the interossei muscles contribute to the extensor expansion (extensor hood).

e. The flexor retinaculum extends between the medial malleolus and the medial tubercle of the calcaneus.

f. With the foot planted firmly on the ground, contraction of the popliteus muscle laterally rotates the femur.

g. The tendon of the popliteus muscle passes between the lateral meniscus and the capsule of the knee joint.

h. The soleus and gastrocnemius muscles arise from the femur.

i. Rupture of the tendocalcaneus results in an inability to plantar flex the foot.

j. Blood drains from the deep to the superficial veins in the leg.

5. With regard to the joints of the lower extremity:

a. The foot is more stable in a dorsiflexed position than a plantar flexed position.

b. Patients with a torn anterior cruciate ligament exhibit the anterior drawer sign in which the tibia may be displaced anteriorly from the femur in the flexed knee.

c. The medial meniscus is extracapsular but intrasynovial.

d. The lateral meniscus has the shape of the letter C and is attached to the tibial collateral ligament.

e. The iliofemoral ligament resists extension.

f. The pubofemoral ligament limits abduction of the hip joint.

g. The line of gravity falls posterior to the hip and knee joints, and anterior to the ankle joint.

h. In the hip joint, the ligamentum capitis is extrasynovial but intracapsular.

i. 50% of the weight of the body falls on the calcaneus in the standing position.

j. The transverse genicular ligament connects the posterior convex margin of the lateral meniscus to the posterior end of the medial meniscus.

6. With regard to respiration:

a. During inhalation, the abdominal muscles contract and push the abdominal viscera cranially.

b. The cardiac notch lies in the upper lobe of the left lung.

c. The visceral pleura is not found in the fissures between the lobes of the lung.

d. Movement at the costovertebral and costotransverse joints of ribs 1-6 contribute to a change in the anterior-posterior plane (termed the pump-handle mechanism).

e. Stimulation of the sympathetic innervation results in dilation of the bronchi.

f. The lingula is part of the upper lobe of the left lung.

g. The phrenic nerve innervates the central part of the diaphragmatic parietal pleura.

h. The inferior reflection of the parietal pleura in the midaxillary line is under the 10th rib.

i. The trachea bifurcates approximately at the level of T4.

j. The vagus and phrenic nerves lie dorsal to the root of the lung.

7. With respect to the thorax:

a. There are 11 pair of external, internal, and innermost intercostal muscles, and 11 pair of subcostal muscles.

b. There are 9 pair of posterior intercostal arteries arising from the aorta.

c. There are 11 pair of posterior intercostal veins and one subcostal vein.

d. The left 2nd anterior intercostal artery is a branch of the costocervical artery that arises from the subclavian artery.

e. The esophagus is narrowed in the region where it is crossed by the left bronchus.

f. Posterior to the 6th rib the internal thoracic vein divides into two terminal branches: the musculophrenic and the superfical epigastric veins.

g. The carina is located at the level of T4.

h. The phrenic nerve lies in the endothoracic fascia between the fibrous coat of the pericardium and the fibrous layer of the mediastinal parietal pleura.

7. In regard to the heart:

a. The right coronary artery gives rise to the anterior interventricular branch.

b. The conducting system of the heart is composed of a deep cardiac plexus.

c. The anterior cardiac veins drain into the right atrium.

d. The atrioventricular bundle extends along the interventricular septum just beneath the epicardium.

e. The greater splanchnic nerve contributes fibers to the SA node of the heart.

f. The superior extent of the arch of the aorta is at the level of T4.

g. The epicardium receives blood from the pericardiacophrenic arteries.

h. The right and left atria form the base of the heart.

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Part III. Indicate your understanding (characteristics, importance, function, and/or contents) of the following. Answer in the space provided. (20 pts)

1. Bronchopulmonary segment. (4 pts)

2. Chordae tendinae. (4 pts)

3. Pericardiacophrenic artery. (4 pts)

4. Lesser sciatic foramen. (4 pts)

5. Retinaculum. (4 pts)

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Part IV. Answer in the space provided (including the back of the page for each question). (36 pts)

1. As a 3rd year resident, you are asked to evaluate a 65-yr old male patient with a chief complaint of "pain behind my right knee." It began approximately one week ago and has progressed to the point that it is painful when he walks less than 50 feet. On exam, there is a soft, pulsatile mass in the right popliteal fossa. In addition, there is a palpable "thrill" or vibration, and when the stethoscope is placed over it a "bruit" (a harsh sound) of turbulent flow is heard. Palpation of the right dorsal pedal pulse is diminished. You are concerned for an aneurysm of the artery in this anatomic location. At your weekly pre-operative surgery conference you are asked to describe the popliteal fossa and its contents that will be explored during this procedure. **Discuss the anatomy of the popliteal fossa, and include an account of the boundaries, structures entering and leaving at each boundary, vascular supply, innervation, ligaments, bones, contents, lymphatics, muscles, and relationships**. (12 pts)

2. A 55-yr old male presents to his physicians office with a chief complaint of "difficulty swallowing solid foods," and a ten pound weight loss over the last 6 weeks. A CT scan reveals a soft tissue mass in the posterior mediastinum. **Define the posterior mediastinum and discuss its contents (nerves, viscera, lymphatics, vasculature), relationships and boundaries.** (12 pts)

3. A 55-yr old morbidly obese male presents to your office with complaints of inability to stand for long periods of time. He has just begun to work as a security guard in a local department store, requiring him to stand most of the night. While performing his duties he notes that his feet become "numb" and "cold" to the point where he has difficulty walking and maintaining his balance. On physical examination, bilaterally he lacks any significant medial arch space and a diagnosis of pes planus - flat feet is determined. **Discuss the medial longitudinal arch and indicate your understanding of the bones, ligaments, muscles, and fascial specialization, and relate your anatomical knowledge to the consequences of damage to these structures.** (12 pts)