

STRUCTURAL BASIS OF MEDICAL PRACTICE

EXAMINATION I

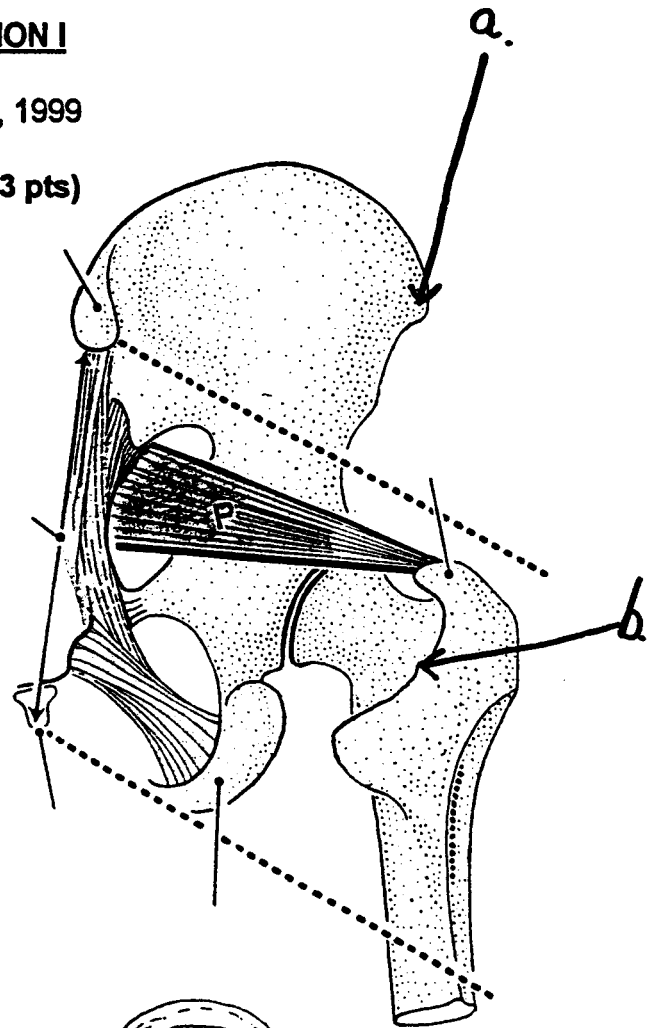
September 3, 1999

PART I. Answer in the space provided. (13 pts)

1. Identify the structures. (1 pt)

a. _____

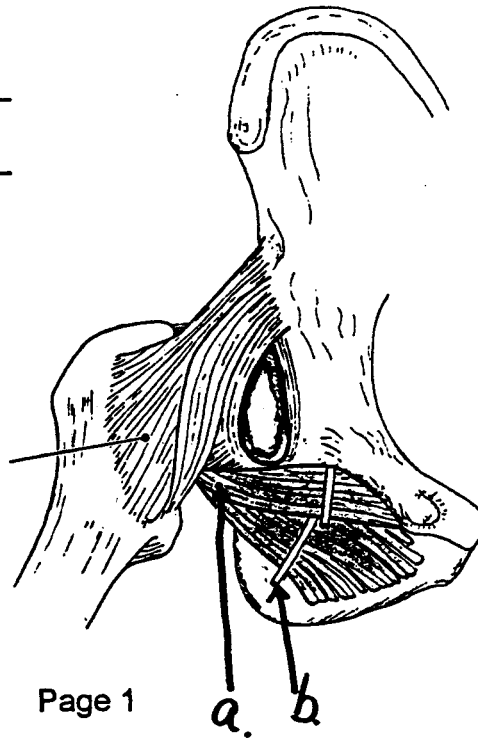
b. _____



2. Identify the structures. (1 pt)

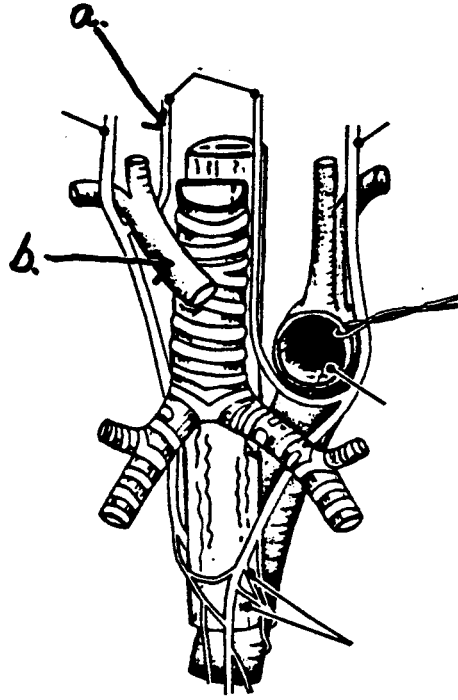
a. _____

b. _____



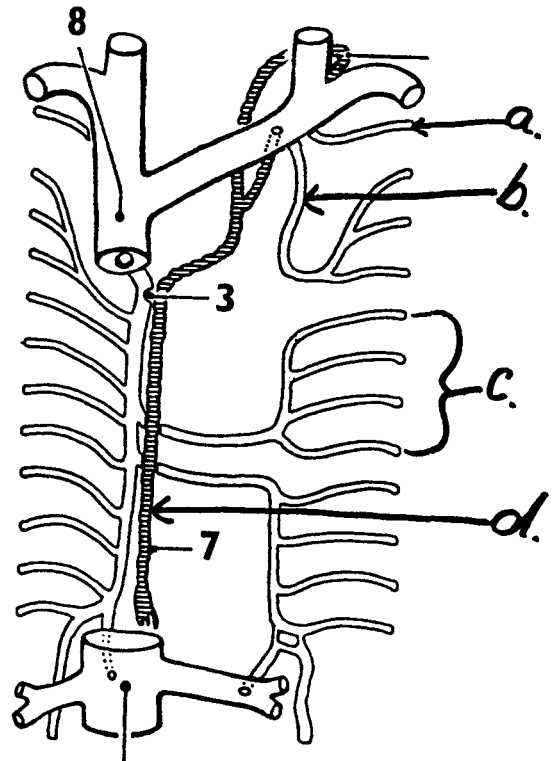
3. Identify the structures. (1 pt)

- a. _____
- b. _____



4. Identify the structures. (2 pts)

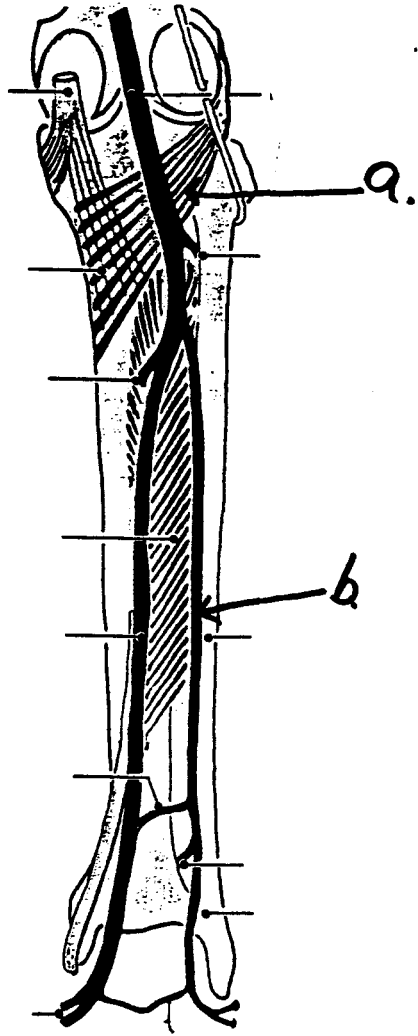
- a. _____
- b. _____
- c. _____
- d. _____



5. Identify the structures. (1 pt)

a. _____

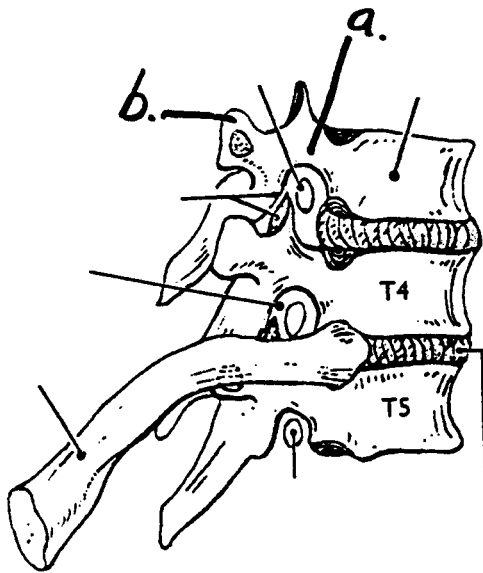
b. _____



6. Identify the structures. (1 pt)

a. _____

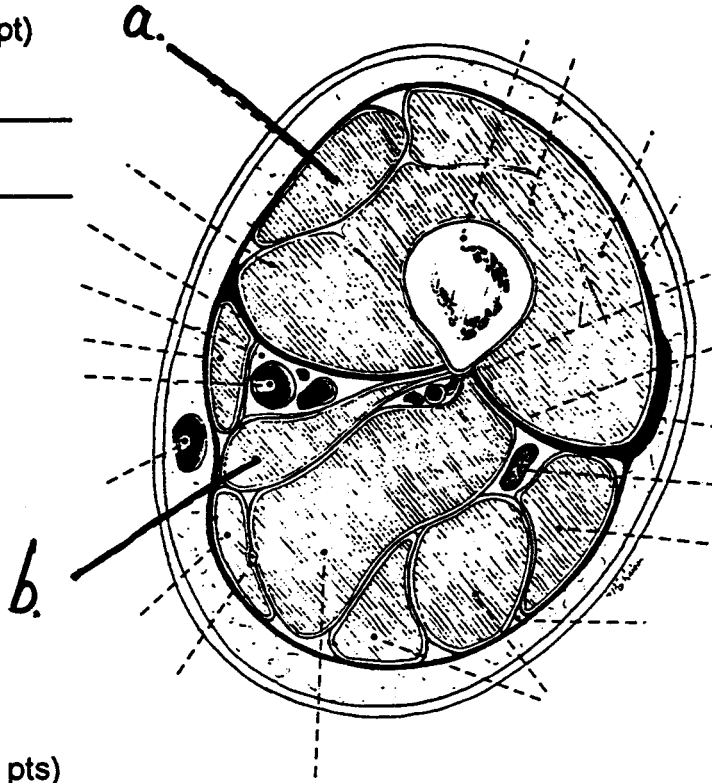
b. _____



7. Identify the structures. (1 pt)

a. _____

b. _____



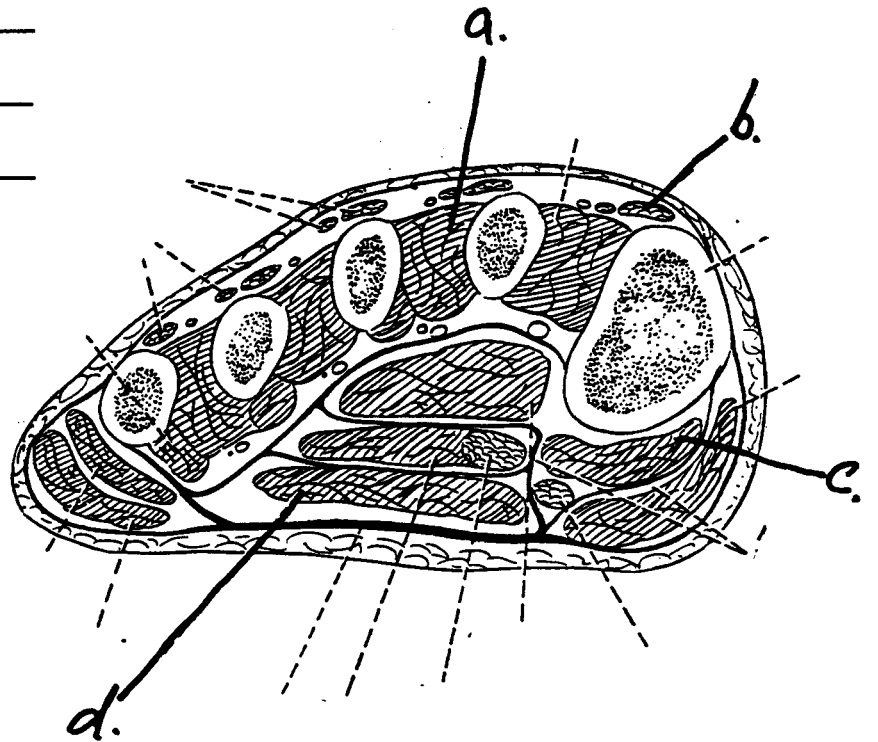
8. Identify the structures. (2 pts)

a. _____

b. _____

c. _____

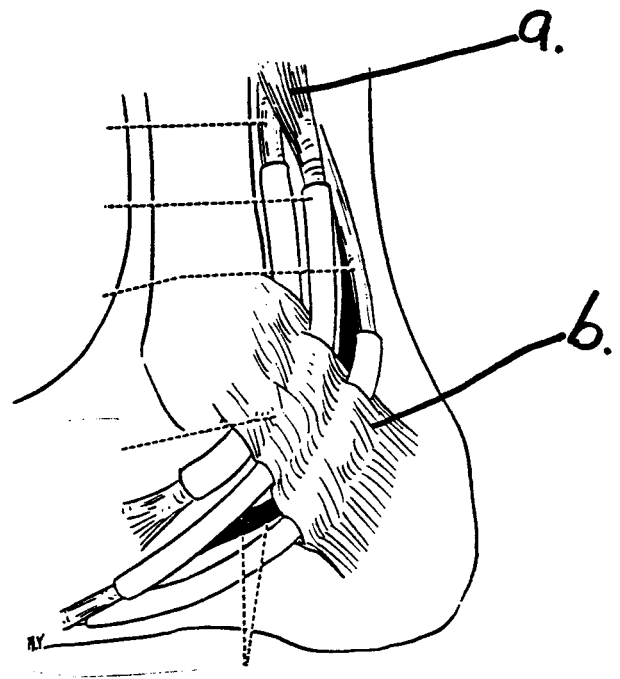
d. _____



9. Identify the structures. (1 pt)

a. _____

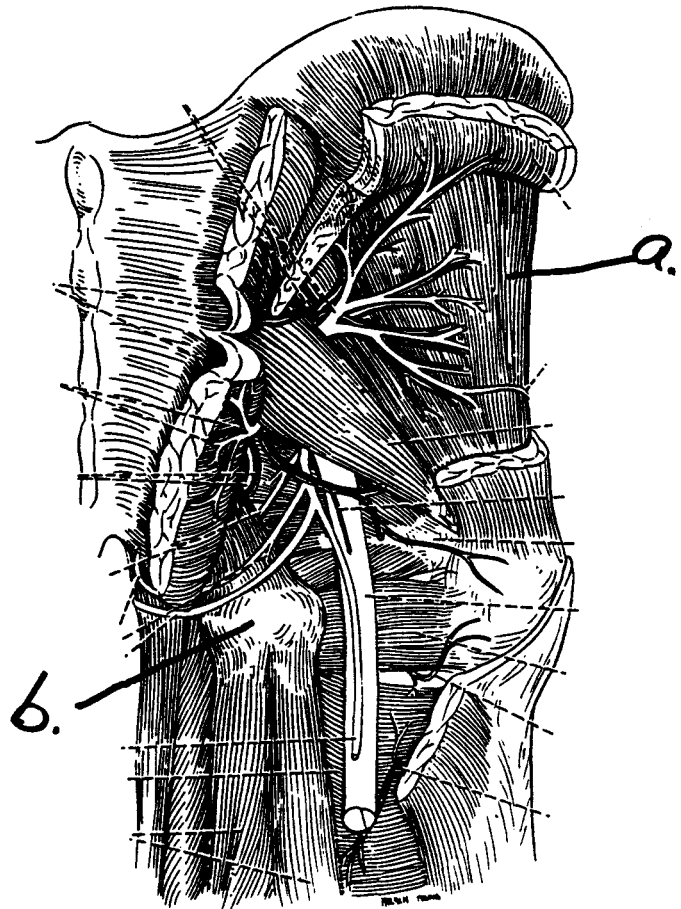
b. _____



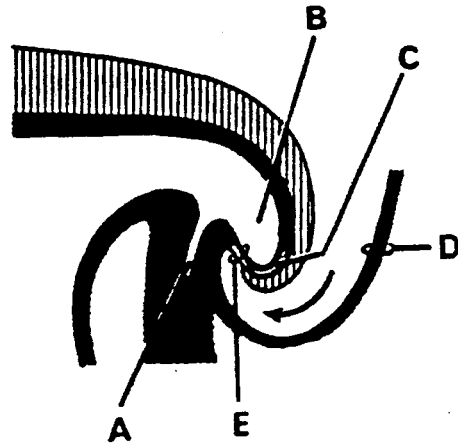
10. Identify the structures. (1 pt)

a. _____

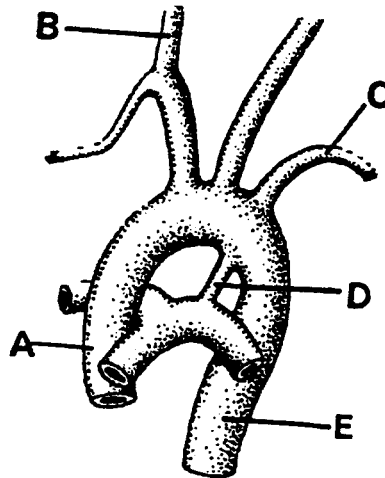
b. _____



11. Which structure (indicated by a letter) indicates the cloaca? (0.5 pt)



12. Which structure (indicated by a letter) is formed from the sixth aortic arch artery? (0.5 pt)



Part II. Circle the one best answer. (6 pts)

1. The normal chromosome number of a human spermatid is:
 - a. 23 autosomes plus 2 different sex chromosomes
 - b. 22 autosomes plus an X and a Y chromosome
 - c. 23 autosomes plus 2 identical sex chromosomes
 - d. 22 autosomes plus an X or a Y chromosome
 - e. 46, XY

2. Which of the following layers of the embryo is recognizable at the end of the first week of development?
 - a. hypoblast
 - b. mesoderm
 - c. ectoderm
 - d. epiblast
 - e. somatopleure

3. During the second week of development, all of the following structures are formed, *except* for the
 - a. amniotic cavity
 - b. neural plate
 - c. yolk sac
 - d. connecting stalk
 - e. chorion

4. Regarding the third week of development, which of the following is *in correct*?
 - a. The notochord induces formation of the neural tube
 - b. Embryonic heart beat can be detected
 - c. Somites begin to form
 - d. Secondary villi become tertiary villi
 - e. Heart tubes begin to fuse

5. Each of the following is a distinctive characteristic of 4-week-old embryos, *except*.
 - a. somites
 - b. hand plates
 - c. pharyngeal arches
 - d. lower limb buds
 - e. neuropores

6. Primary ossification centers first appear in the fetus after
 - a. 9 weeks
 - b. 13 weeks
 - c. 17 weeks
 - d. 21 weeks
 - e. 25 weeks

7. Primary chorionic villi are recognizable by the end of the _____ week.
- a. first
 - b. second
 - c. third
 - d. fourth
 - e. fifth
8. Which of the following teratogens is usually associated with tooth defects, such as discoloration of the teeth and hypoplasia of the enamel?
- a. cocaine
 - b. thalidomide
 - c. alcohol
 - d. tetracyclines
 - e. methotrexate
9. Each of the following structures is involved in the development of the diaphragm *except* the
- a. lateral body wall
 - b. pleuroperitoneal membranes
 - c. septum transversum
 - d. pleuroperitoneal membranes
 - e. esophageal mesentery

10. The connective tissue, cartilage, and smooth muscle of the trachea are derived from
 - a. somatic mesoderm from the lateral plates
 - b. splanchnic mesenchyme around the laryngotracheal tube
 - c. endodermal lining of the laryngotracheal tube
 - d. mesenchyme from the fourth to the sixth pairs of pharyngeal arches
 - e. neural crest

11. Diverticulum of the pharynx is associated with:
 - a. Laryngotracheal groove
 - b. Somatic mesoderm
 - c. Surfactant
 - d. Esophageal atresia
 - e. Splanchnic mesenchyme

12. Pulmonary valve stenosis is associated with:
 - a. Coarctation
 - b. Infundibular stenosis
 - c. Patent ductus arteriosus
 - d. VSD
 - e. Tetralogy of Fallot

Part III. Circle the correct answer. All, none, or some may apply. (27 pts)

1. With regard to the nervous system:

- a. White rami communicans can be found at the level of 2nd thoracic nerve
- b. Gray rami communicans can be found at the level of 2nd thoracic nerve
- c. The vagus nerve contains postganglionic parasympathetic nerve fibers
- d. The intercostal nerves are somatic nerves
- e. The epicardium contains fibers sensitive to stretch and constriction

2. In the gluteal region:

- a. The gluteus minimus is a medial rotator of the thigh
- b. Lesion of the right superior gluteal nerve may lead to pelvic sag when the right leg is in the swing phase of walking (i.e., off of the ground)
- c. The tendon of the obturator internus muscle makes a 140 degree angle as it emerges from the lesser sciatic foramen
- d. The posterior femoral cutaneous nerve lies deep to the quadratus femoris
- e. Gluteal injections are recommended in the upper and outer quadrant

3. With respect to the mediastinum:

- a. The pericardiophrenic artery and vein courses through the endothoracic fascia
- b. Superior to the root of the lung, both trachea and esophagus are crossed by the azygous vein on the right side
- c. One of the contents of the posterior mediastinum is the esophageal plexus
- d. Contents of the superior mediastinum include the vagus and phrenic nerves, and the sympathetic trunks
- e. The arch of the aorta is at the level of T4

4. With respect to the respiratory system:

- a. The pump-handle movement of respiration involves ribs 7 through 10
- b. The plane of bucket-handle movement expands the anterior-posterior diameter
- c. Soon after leaving the pericardial sac, both right and left pulmonary arteries arch over the principal bronchi as they enter the hilum of the lung
- d. A foreign body inhaled into the trachea is much more likely to lodge in the left bronchus
- e. The arch of the aorta makes an impression on the right lung

5. With respect to the thorax:

- a. The 8th anterior intercostal artery is a branch of the musculophrenic artery
- b. The right 2nd anterior intercostal vein terminates in the azygous vein
- c. The right 4th anterior intercostal artery lies in a plane between the external intercostal muscle and the internal innercostal muscle
- d. There are 12 pair of intercostal spaces
- e. The left 2nd anterior intercostal artery is a branch of the costocervical artery that arises from the subclavian artery

6. In the lower extremity:

- a. The part of the adductor magnus arising from the pubic arch is supplied by the tibial division of the sciatic nerve
- b. The semimembranous muscle, but not the semitendinous muscle, can be palpated
- c. The division of the popliteal artery into anterior and posterior tibial arteries occurs posterior to the femur at the level of the lateral and medial epicondyles
- d. Hamstring muscles flex the hip and flex the knee
- e. Hamstring muscles are vascularized by the peroneal artery and vein

7. In the leg:

- a. The small saphenous vein is formed by the dorsal venous arch
- b. The posterior tibial artery is located on the fibular side of the leg
- c. The peroneus tertius is a lateral slip of the extensor hallucis longus
- d. The posterior medial malleolar artery is a branch of the peroneal artery
- e. The flexor hallucis longus muscle arises in part from the posterior surface of the fibula

8. In terms of the line of gravity and weight distribution of the body when standing upright:

- a. 50% of the body weight is distributed to the calcaneus
- b. the line of gravity passes in front (anterior) of the hip joint
- c. the first tarsal bone typically bears about twice the weight of the second tarsal bone
- d. the line of gravity passes in front of the knee joint
- e. the line of gravity passes behind the ankle joint

9. The adductor canal:

- a. arises at the base of the femoral triangle
- b. transmits the saphenous nerve
- c. contains the femoral vein
- d. has the adductor longus as a posterior boundary
- e. encloses the anterior femoral cutaneous nerve

10. The piriformis muscle:

- a. arises from the inner surface of the ilium
- b. inserts on the greater trochanter
- c. the pudendal nerve exits superior to this muscle
- d. largely fills the greater sciatic foramen
- e. laterally rotates the thigh

11. With regard to the fascia lata:

- a. is the superficial fascia of the thigh
- b. attaches to the inguinal ligament
- c. the tensor fascia latae and the gluteus maximus muscle insert into the iliotibial tract
- d. the saphenous opening allows the great saphenous vein to terminate in the femoral vein

Part III. Answer in the space provided (including the back of the page for each question. (54 pts)

1. While serving as a resident in emergency medicine, a 29-yr old male is admitted with a gunshot wound to the femoral triangle. The wound is bleeding profusely and you suspect laceration (i.e., tearing) of the femoral vasculature. **Review the boundaries (6 in number) and contents (vasculature, nerves, lymphatics) of the femoral triangle. State the relationship of structures entering and leaving this region. (12 pts)**

2. You are preparing for a "total knee" arthroplasty in a patient with degenerative disease of the knee. This operation consists of removing all intrinsic ligaments and cartilaginous structures and replacement with an artificial joint prosthesis. **Review the anatomy of the knee joint and include bones, articulations, ligaments, cavities and bursa, vasculature, muscles, and fascial specializations that contribute to the stability of the knee joint. State when and why the knee joint is maximally stabilized.** (15 pts)

3. While serving as a doctor at a beach resort in Florida, a 35-yr old male arrives in the clinic with a nail that penetrates the sole of the foot and pierces the spring ligament. **Discuss the fascia, muscles, tendons, nerves (including cutaneous innervation), bones, and vasculature involved with such an injury. (10 pts)**

4. A 70-yr old female has an irregular heartbeat, and is being prepared to receive a pacemaker. **Discuss the anatomy of the right atrium. Include mention of the conducting system and anatomical landmarks. (8 pts)**

5. Breast cancer afflicts 200,000 women each year, and is responsible for a mortality of 40,000/yr. Breast cancers have the capability of metastasizing (spreading) through the lymphatic channels. Describe the lymphatic drainage of the breast. (6 pts).

6. Briefly describe the inferior limits of the parietal and visceral pleura. (3 pts)