EXAM NUMBER_____

Graduate HUMAN GROSS ANATOMY – ANAT 503
EXAMINATION 5

November 2, 2018

PART I. Answer in the space provided. (16 pts)

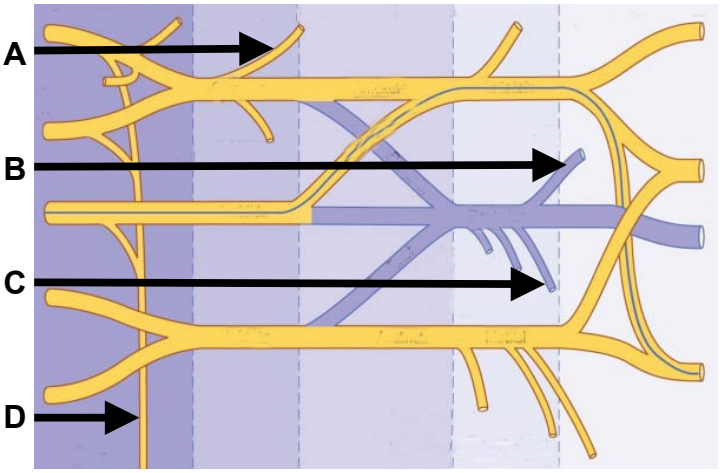
1. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



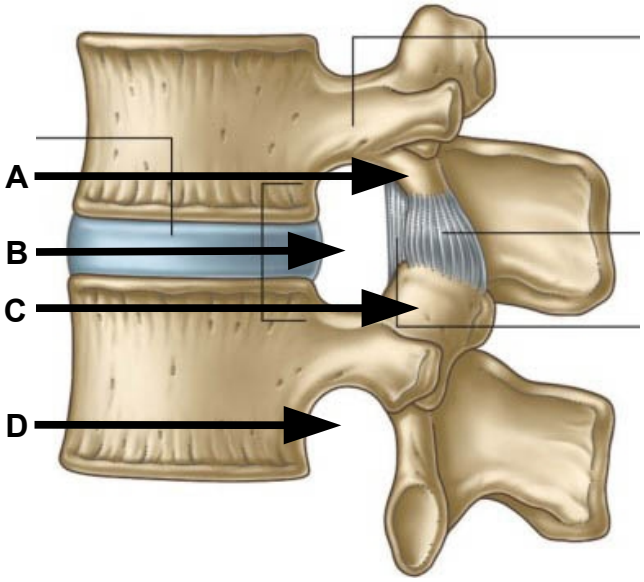
2. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



EXAM NUMBER_____

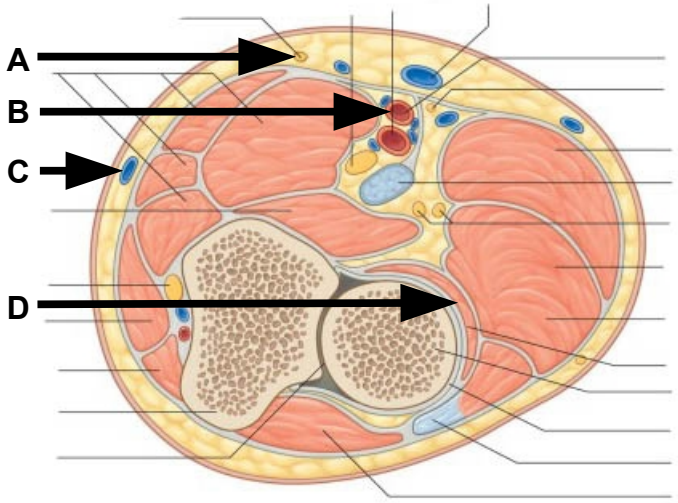
3. Identify the Structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



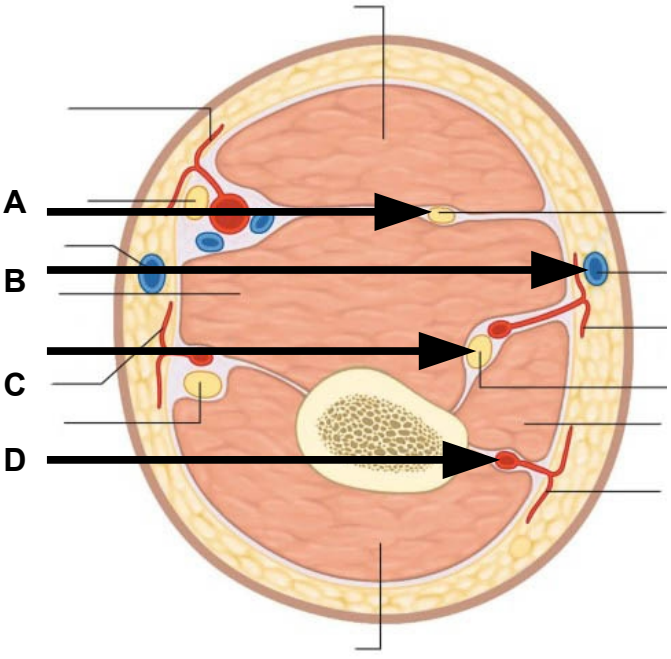
4. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



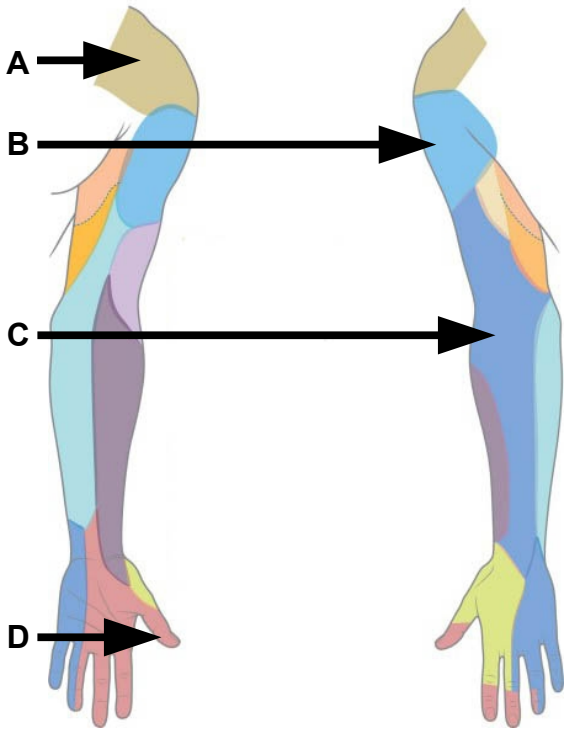
5. Identify the nerve distribution. (2 pts)

A. _____

B. _____

C. _____

D. _____



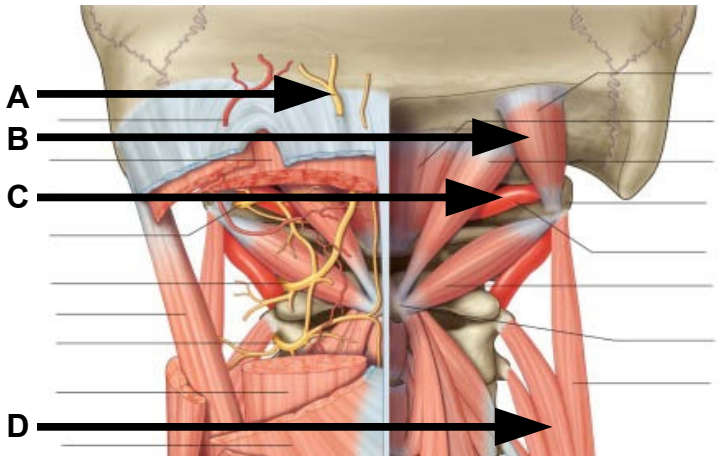
6. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



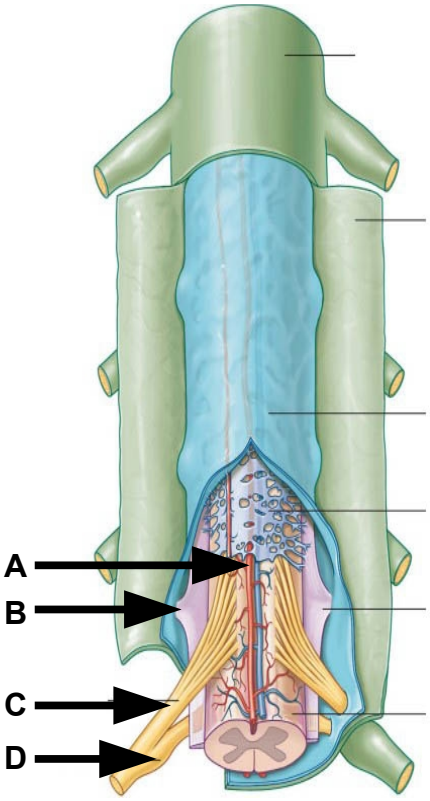
7. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



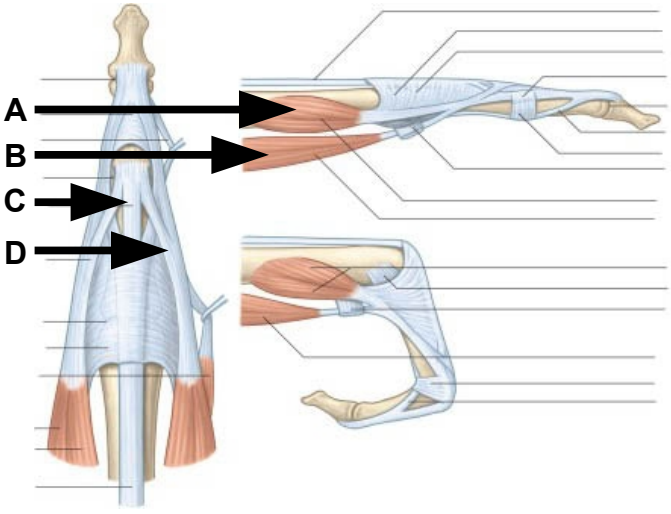
8. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



Part II. Circle the correct answer. All, none, or some may apply. (18 pts)

1. **With regard to the back, suboccipital region, and scapular region:**

   a) Erector spinae muscles are innervated by dorsal rami and serratus posterior/inferior muscles are innervated by ventral rami.

   b) The atlantoaxial joint primarily mediates rotation and the atlanto-occipital joint primarily mediates flexion and extension.

   c) The suprascapular artery does not pass through the superior transverse scapular notch.

   d) The suprascapular nerve and artery pass through the spinoglenoid notch.

   e) The suboccipital nerve provides cutaneous innervation along the C1 dermatome.

   f) The lateral branches of dorsal rami are primarily sensory and the medial branches are primarily motor.

2. **With regard to the axilla and brachial plexus:**

   a) Severance of the posterior cord of the brachial plexus causes uncompensated loss of active extension at the elbow.

   b) Erb's palsy primarily affects the shoulder and Klumke's palsy primarily affects intrinsic muscles of the hand.

   c) Radial nerve injury at the spiral groove weakens flexion of the elbow.

   d) A lesion of the dorsal scapular nerve weakens protraction of the scapula.

   e) Severance of the axillary nerve at the quadrangular space weakens all movements of the shoulder joint

   f) The ascending branch of the profunda brachii artery participates in an anastomosis of the shoulder joint.

3. **With regard to the arm and cubital fossa:**

   a) The median cubital vein passes superficial to the bicipital aponeurosis.

   b) The brachial artery, but not the median nerve, is protected by the bicipital aponeurosis.

   c) The ulnar nerve and the inferior collateral ulnar artery enter the cubital tunnel.

   d) The anterior ulnar recurrent artery forms an anastomosis with the superior ulnar collateral artery.

   e) Each of the four terminal branches of the brachial plexus that enter the arm contribute to flexion at the elbow.

   f) The interosseous recurrent artery forms an anastomosis with the radial collateral artery.

4. With regard to the forearm and the dorsum of the hand:

a) All muscles that arise from the common flexor tendon are biarticulate.

b) Brachioradialis, a muscle of the posterior compartment of the arm, adducts the wrist and extends the fingers.

c) The posterior interosseous artery enters the posterior compartment of the forearm by passing the superior free edge of the interosseous membrane.

d) The interosseous recurrent artery ascends toward the lateral humeral epicondyle by passing within anconeus.

e) The tendons of the interosseous muscles pass posterior to the deep transverse metacarpal ligament and posterior to the transverse axis of the metacarpophalangeal joints.

f) The anterior interosseous nerve passes posterior to pronator quadratus and extends distally to provide sensory innervation to the carpal bones and joints.

5. With regard to the hand:

a) The ulnar two lumbricals are unipennate and innervated by the ulnar nerve and the radial two lumbricals are bipennate and innervated by the radial nerve.

b) Cutaneous nerves that supply the palmar surface of the fingers also supply the dorsal surfaces at the nail beds.

c) The pisiform bone, a sesamoid bone, rests on the posterior surface of the triquetrum bone.

d) The tendons of flexor digitorum superficialis split into medial and lateral slips that insert onto the base of the middle phalanges.

e) The origin of abductor digiti minimi is shared with the insertion of adductor carpi ulnaris.

f) The natatory ligament is the most distal part of the palmar aponeurosis.

6. With regard to the joints of the upper limb:

a) The radial collateral ligament blends with the annular ligament.

b) The annular ligament attaches to the ulna at the radial notch.

c) A shoulder separation occurs at the sternoclavicular joint and a shoulder dislocation occurs at the acromioclavicular joint.

d) The triangular fibrocartilage complex (TFCC) includes an articular disc that limits abduction at the wrist.

e) Opposition of the thumb occurs at the metacarpophalangeal joint.

f) The radial tuberosity moves posterior during pronation.

Part III. Indicate your understanding of the following. (30 pts)

1. The levator scapulae muscle may be used as a landmark for anesthesia. **Briefly discuss the anatomy and relationships of the levator scapulae muscle. (6 pts)**

2. The circumflex scapular artery plays in key role in the pattern of blood flow following ligation of the axillary proximal to the subscapular artery. **Review the pattern of blood flow in the infraspinous fossa under normal conditions and under conditions when the axillary artery is ligated. (6 pts)**

3. The long head of the biceps tendon may become frayed within the intertubercular sulcus. **Review the anatomy and relationships of the intertubercular sulcus. (6 pts)**

4. The pronator teres muscle provides the inferior medial border of the cubital fossa.
Review the anatomy and relationships of the pronator teres muscle. (6 pts)

5. Abduction of the upper limb from anatomical position to 180 degrees above the head requires the recruitment of 4 muscles served by four nerves. **Briefly discuss the ranges of movement provided by the muscles and nerves that allow for full abduction of the upper limb. (6 pts)**

Part IV. Essay. (36 pts)

1. The shoulder joint has extreme mobility paired with inherent instability. The head of the humerus and the glenoid fossa have been compared to a golf ball on a tee. Much of the support for glenohumeral joint is derived from soft tissues. **Review the anatomy of the glenohumeral joint. Include bones, articulations, ligaments, capsules, cavities, contents, muscles, movements and limitations of movement, vasculature , lymphatic drainage, innervation, and relationships. (12 pts)**

2. Narrowing of the spinal canal (spinal stenosis) may cause bilateral symptoms. Narrowing of the intervertebral foramina may cause unilateral symptoms. **Review the anatomy of the vertebral column and spinal canal. Include bones, articulations, ligaments, spaces, contents, muscles, movements and limitations of movement, vasculature and lymphatic drainage, innervations, and relationships. Include an account of the fascial layers penetrated during lumbar puncture. (12 pts)**

3. The ulnar nerve may become entrapped within the cubital tunnel. **Review the anatomy of the cubital tunnel. Discuss functional deficits and deformities caused by long term damage to the ulnar nerve at the cubital tunnel. (12 pts)**