EXAM NUMBER_____

Graduate HUMAN GROSS ANATOMY – ANAT 503
EXAMINATION 5

November 8, 2019

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

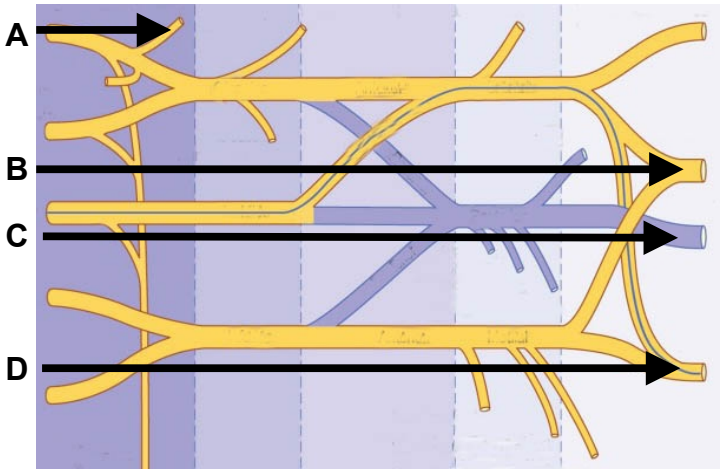
1. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



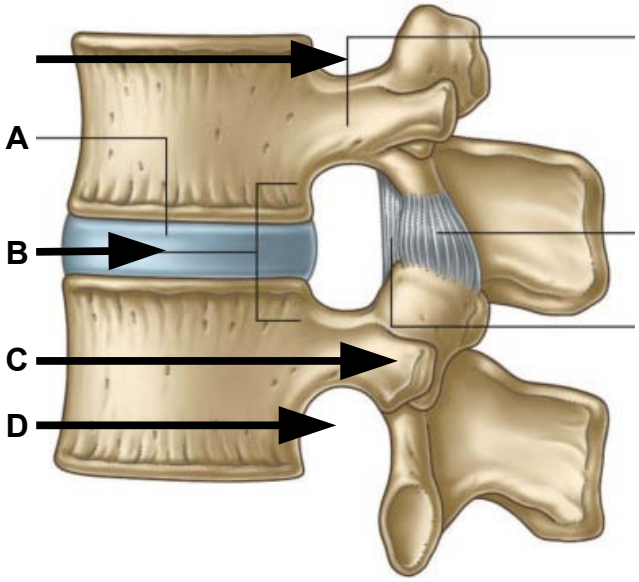
2. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



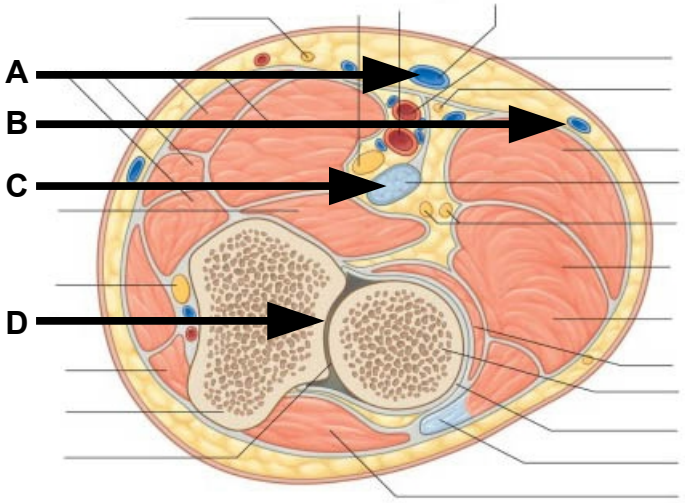
3. Identify the Structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



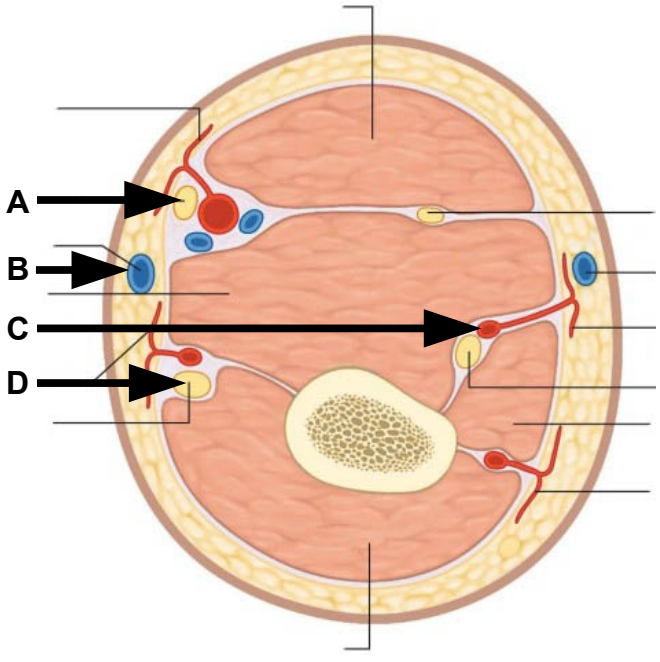
4. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



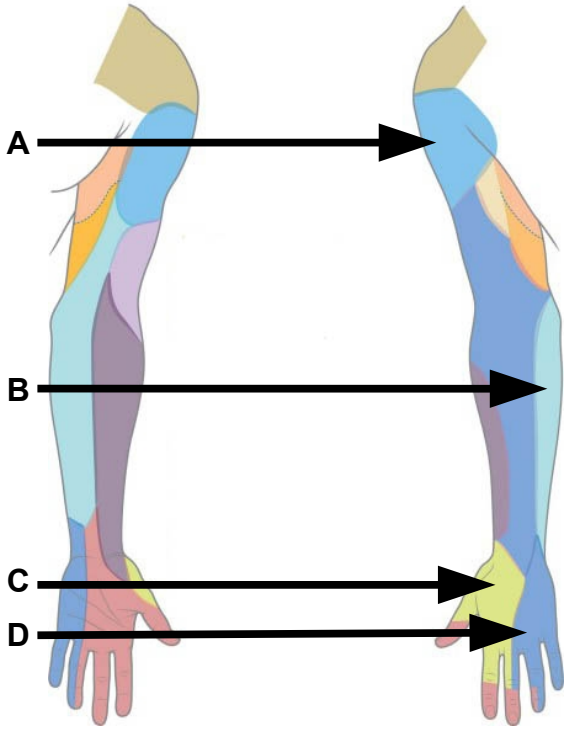
5. Identify the nerve distribution. (2 pts)

A. _____

B. _____

C. _____

D. _____



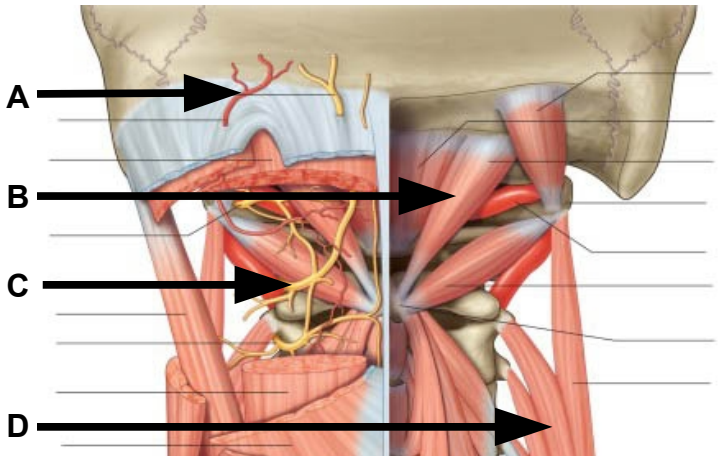
6. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



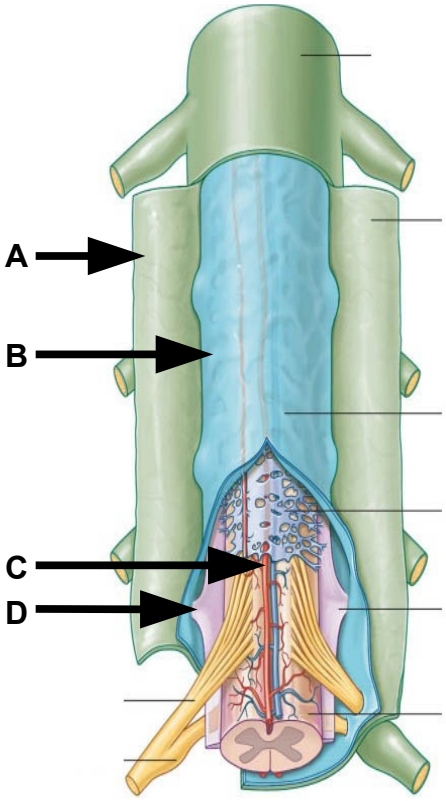
7. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



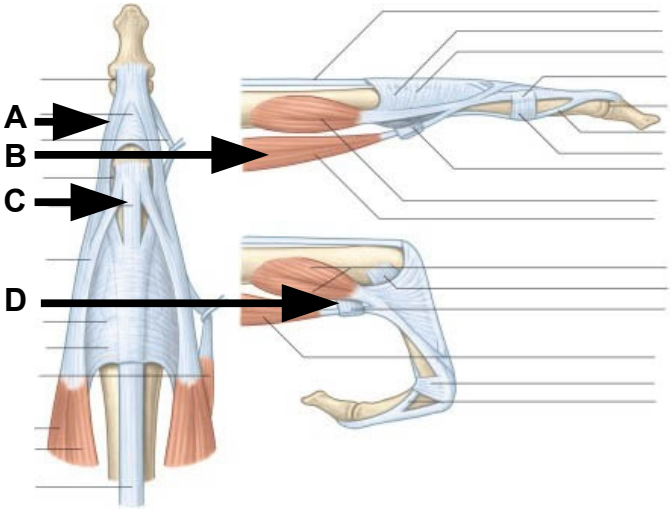
8. Identify the structures. (2 pts)

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 lateral branches of intercostal nerves.

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

   c) The dorsal scapular nerve passes medial to the levator scapulae muscle.

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

   e) The suboccipital nerve provides motor innervation to the muscles of the suboccipital triangle.

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

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

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

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

   c) Musculocutaneous nerve injury at the axilla weakens supination of the elbow.

   d) A lesion of the spinal accessory 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 at the elbow joint.

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

   a) The median cubital vein passes deep 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 ulnar tunnel.

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

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

   f) The interosseous recurrent artery forms an anastomosis with the middle 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 median cubital vein is often used for venipuncture. **Cite the relationships of contents within the cubital fossa that are at risk during venipuncture. (6 pts)**

2. The circumflex scapular artery plays in key role in the pattern of blood flow following ligation of the axillary artery 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. “Saturday Night Palsy” refers to functional deficits following compression of the radial nerve at the spiral groove. **Provide a brief account for the sensorimotor deficits caused by radial nerve compression at the radial grove. Consider weaknesses and resting positions for the shoulder, elbow, wrist, and finger joints. (6 pts)**

4. The median nerve may become entrapped at the pronator teres or at the carpal tunnel. **Compare pronator teres and carpal tunnel syndromes according to resting joint positions and palmar numbness. (6 pts)**

5. Pronation and supination of the forearm occurs at the proximal and distal radioulnar joints. **Briefly discuss the ligaments that support the humeroradial and proximal radioulnar joints. (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) is likely to cause bilateral symptoms. Narrowing of the intervertebral foramina is likely to 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 or within the ulnar tunnel (Guyon's canal). **Review the anatomy of the cubital tunnel and the ulnar tunnel. Provide an account for the anatomical basis of the claw hand deformity. Compare functional deficits, resting positions, and deformities caused by damage to the ulnar nerve at the cubital tunnel and at the ulnar tunnel. (12 pts)**