EXAM NUMBER_____

Graduate HUMAN GROSS ANATOMY – ANAT 503
EXAMINATION 5

November 3, 2017

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

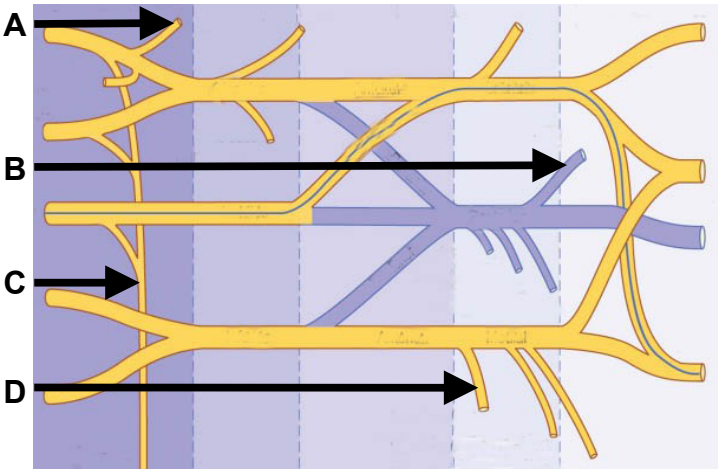
1. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



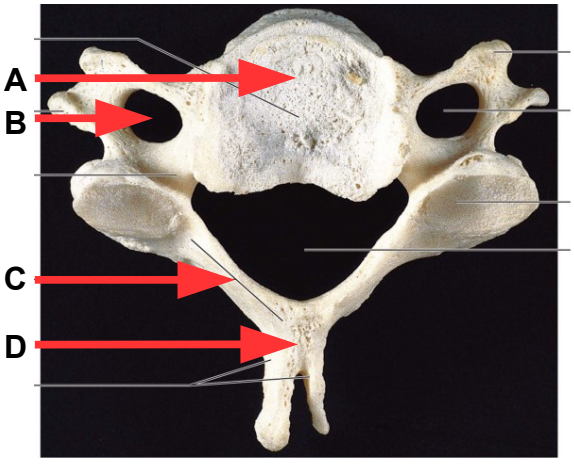
2. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



EXAM NUMBER_____

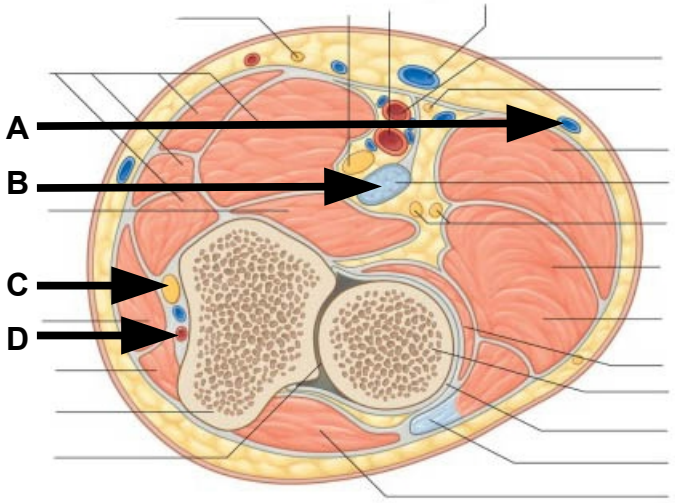
3. Identify the Structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



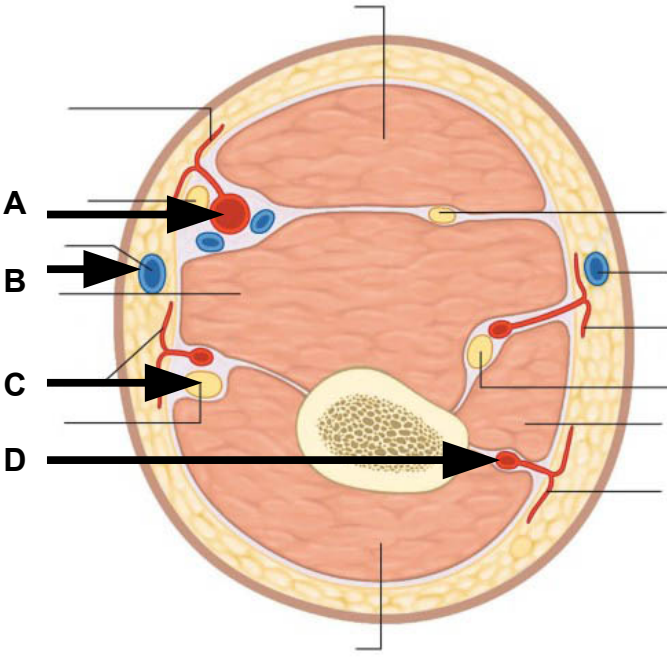
4. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



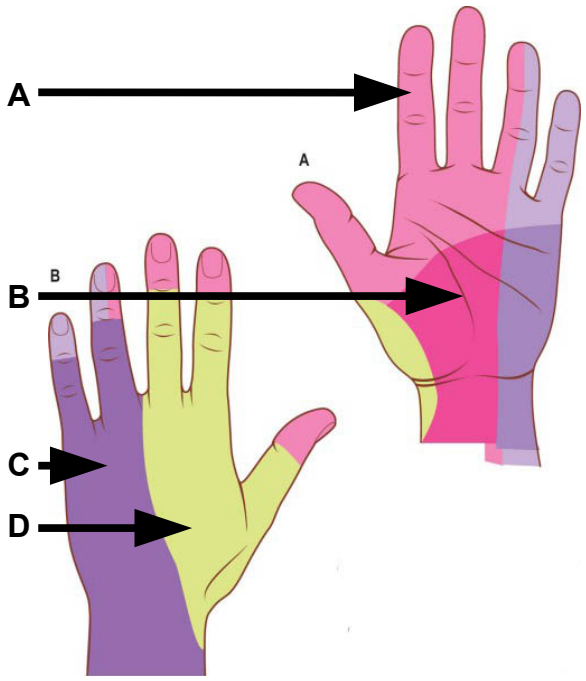
5. Identify the nerve distribution. (2 pts)

A. _____

B. _____

C. _____

D. _____



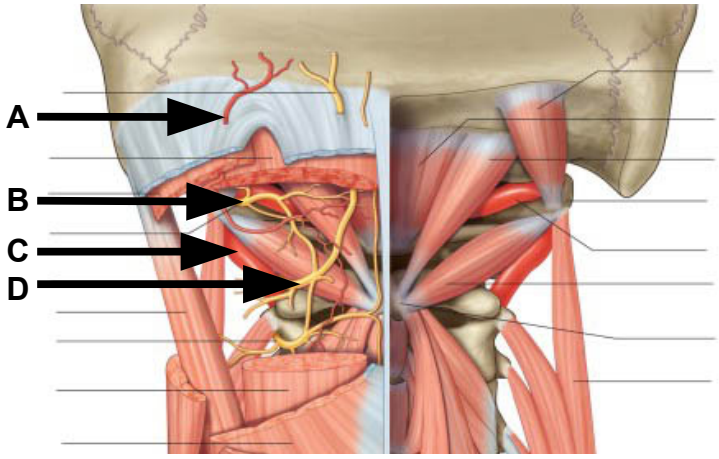
6. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



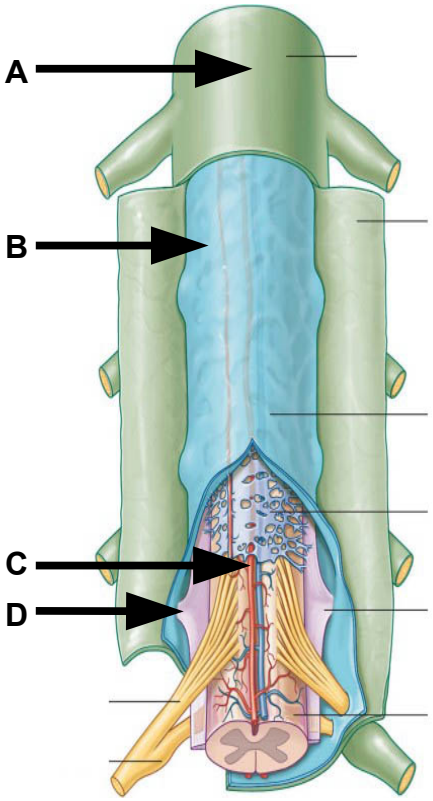
7. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



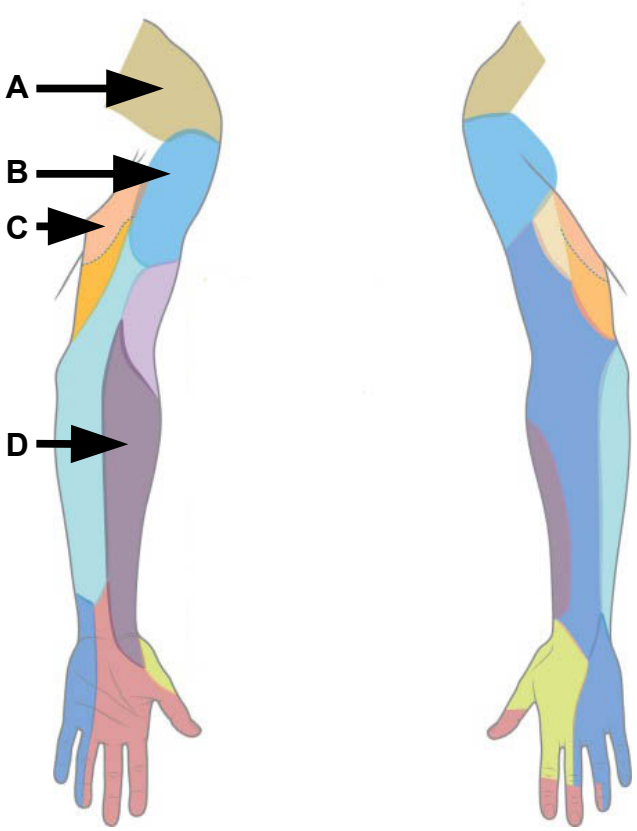
8. Identify the structures. (2 pts)

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 are innervated by ventral rami.

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

   c) Latissimus dorsi inserts at the floor of the intertubercular sulcus between the insertions of pectoralis major and teres major.

   d) The acromial branch of the thoracoacromial trunk and the ascending branch of the profunda brachial artery participate in the shoulder anastomosis.

   e) The upper lateral cutaneous nerve of the arm is used to test the integrity of the axillary nerve.

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

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

   a) Severance of the lateral cord of the brachial plexus entirely eliminates flexion at the elbow.

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

   c) Severance of the posterior cord that affects all branches eliminates medial rotation at the glenohumeral joint.

   d) A lesion of the dorsal scapular nerve weakens lateral rotation of the arm.

   e) Severance of the radial nerve at the spiral grove results in a flexed wrist and loss of extension at the elbow.

   f) The profunda brachii artery passes through the triangular space to arrive at the infraspinous fossa.

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 artery enter the cubital tunnel.

   d) The median nerve passes between the heads of origin of the pronator teres.

   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 superior ulnar collateral artery.

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

   a) Muscles that arise from the common flexor tendon are innervated by the median, ulnar, and radial nerves.

   b) Brachioradialis, a muscle of the posterior compartment of the forearm flexes the wrist and extends the fingers.

   c) The anterior interosseous artery enters the posterior compartment of the forearm by passing the inferior free edge of the oblique ligament.

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

   e) The tendons of the lumbrical muscles pass anterior to the deep transverse metacarpal ligament and anterior 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 median nerve and the radial two lumbricals are bipennate and innervated by the ulnar 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 anterior surface of the trapezoid bone.

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

   e) Abductor digiti minimi shares an origin with an insertion of flexor carpi ulnaris.

   f) The natatory ligament is more closely associated with stabilizing the palmar skin and the deep transverse metacarpal ligament is more closely associated with stabilizing bone.

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

   a) Joints having high mobility are less stable than joints having low mobility.

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

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

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

   e) The olecranon process rests in the olecranon fossa when the elbow is flexed.

   f) The radial tuberosity moves posterior during pronation.

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

1. Falling on an outstretched hand may fracture the hook of the hamate bone at Guyon's canal (ulnar canal) and crush the ulnar nerve.. **Briefly discuss the basis of claw hand deformity. Why are the radial two fingers less clawed than the lateral two fingers? (6 pts)**

2. Radical breast mastectomy may cause “winging” of the scapula. **Review the nerve and muscle that, when disrupted, cause winging of the scapula. (6 pts)**

3. The elbow joint is consists of three joints; the humeroradial, humeroulnar, and proximal radioulnar joints. **Review the movements and stability of the humeroulnar joint. (6 pts)**

4. The scapular anastomosis provides blood supply to the upper limb during surgical ligation of the axillary artery proximal to the subscapular artery. **Trace the collateral circulation of the scapular anastomosis when the axillary artery is ligated. Note the location of retrograde flow. (6pts)**

5. Abduction of the upper limb from anatomical position to 180 degrees above the head requires 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.**

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. Repetitive wrist motion may cause swelling within the carpal tunnel. **Review the anatomy of the carpal tunnel. Discuss functional deficits and deformities caused by long term compression of the contents of the carpal tunnel. (12 pts)**