EXAM NUMBER_____

HUMAN GROSS ANATOMY – ANAT 503
EXAMINATION 7

December 11, 2015

PART I. Answer in the space provided. (12 pts)

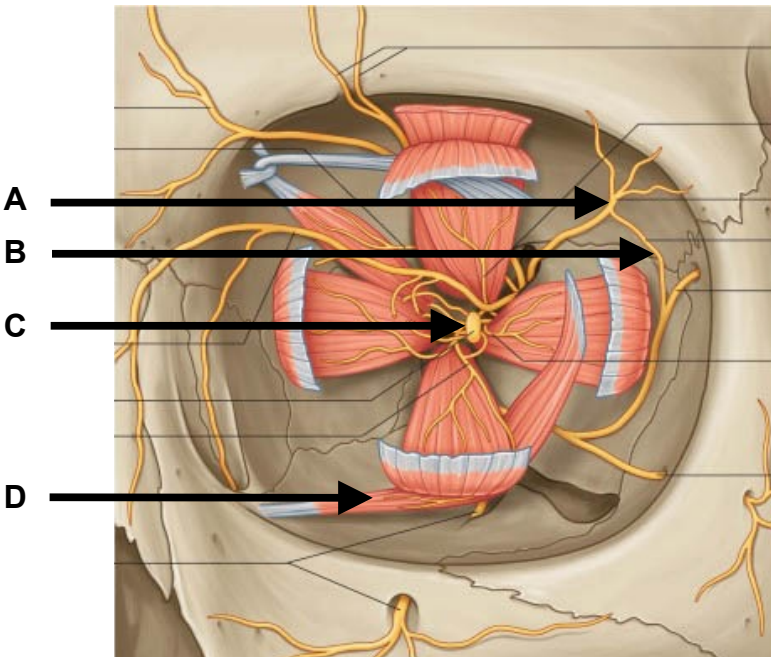
1. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



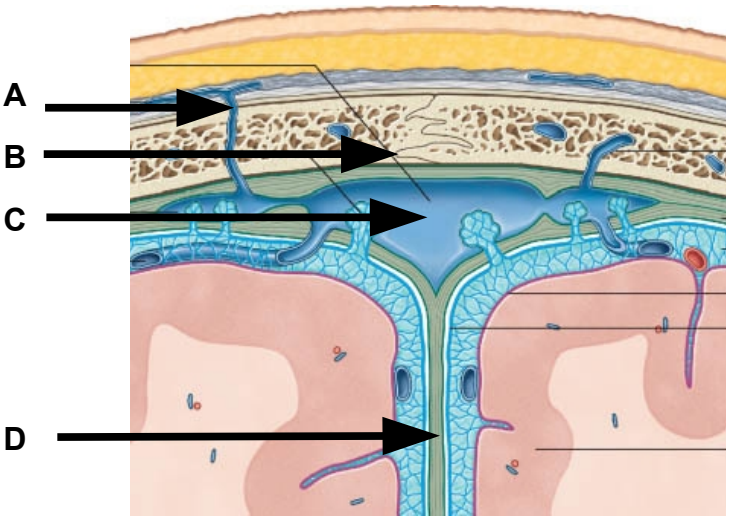
2. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



EXAM NUMBER_____

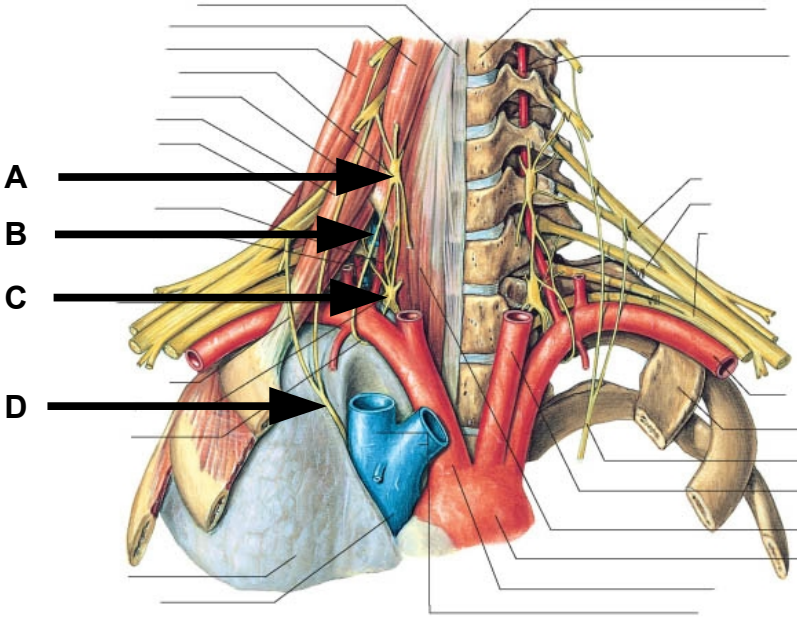
3. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



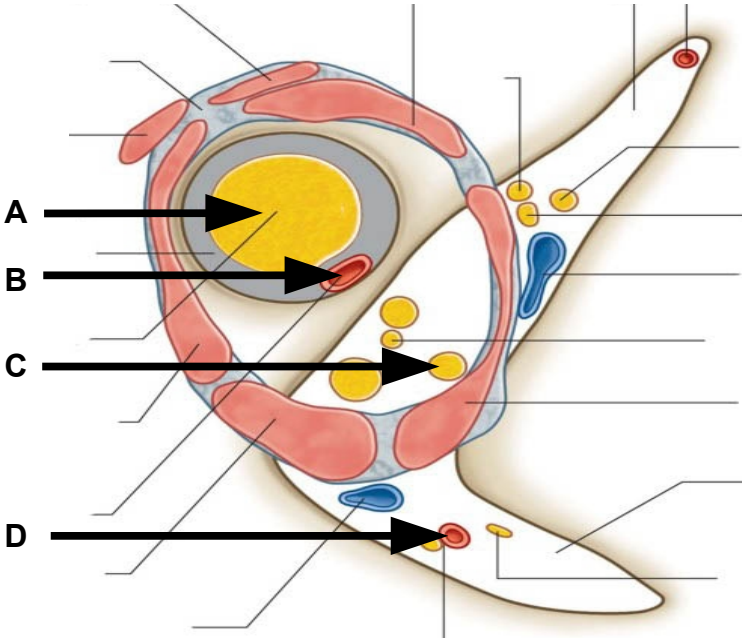
4. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



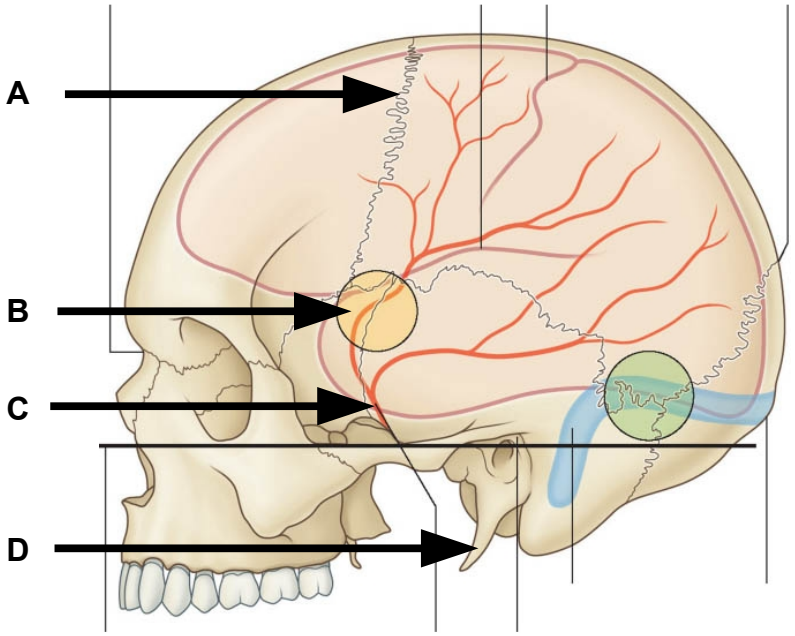
5. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



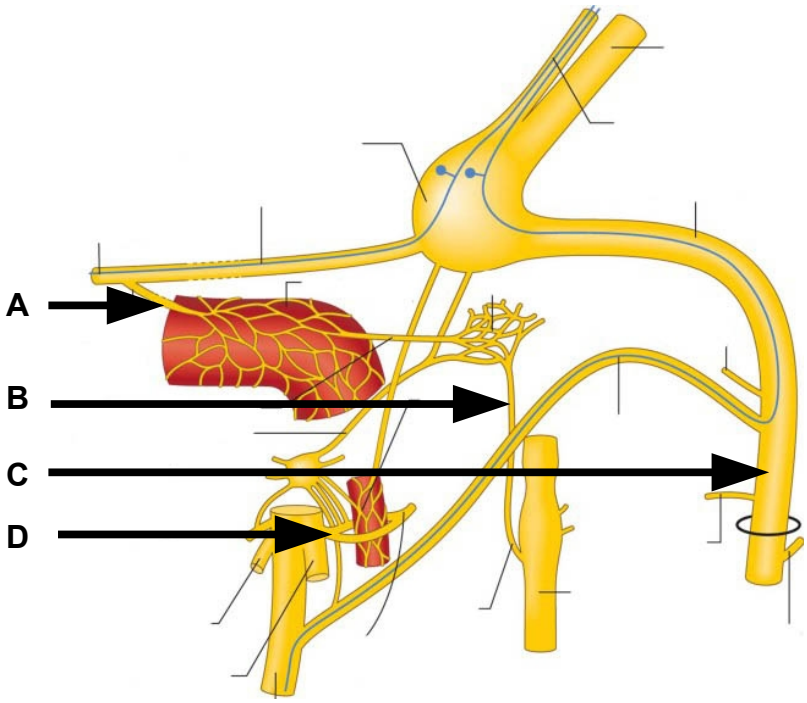
6. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



Part II. Circle the correct answer. All, none, or some may apply. (16 pts)

1. **With regard to the cranial nerves:**

   a) The olfactory fascicles pass through the ethmoidal air cells and then the cribriform plate before entering the nasal cavity.

   b) The recurrent tympanic nerve combines with the greater superficial petrosal nerve to form the nerve of the pterygoid canal.

   c) The glossopharyngeal nerve conveys SVE (Special Visceral Efferent), GVA (General Visceral Afferent) and SVA (Special Visceral Afferent) fibers to the posterior 1/3 of the tongue.

   d) SVE (Special Visceral Efferent) fibers of the vagus nerve contribute to the elevation of the soft palate and to the equalization of air pressure within the middle ear.

   e) A deviated protrusion of the tongue to the right side indicates a lesion of the right hypoglossal nerve.

   f) The inferior division of the oculomotor nerve elaborates the motor root (short root) of the ciliary ganglion.

   g) A lesion of the glossopharyngeal nerve at the posterior tongue disrupts elevation of the larynx during swallowing, the gag reflex, salivary secretion, and taste sensation to the posterior one-third of the tongue.

   h) The GSA fibers that ultimately make up the external nasal nerve pass through the posterior, middle, and anterior cranial fossae, the cavernous sinus, orbit, anterior ethmoidal air cells, cribriform plate, and nasal cavity.

   i) The buccal nerve crosses the medial side of the masseter muscle and provides GSA fibers to the skin of the cheek and to the mucosa lining the buccinator muscle.

2. **With regard to the anterior and posterior triangles of the neck:**

   a) Nerve fibers that form the nerve to geniohyoid are from the cervical plexus and travel with the hypoglossal nerve.

   b) Fibers from the cervical plexus travel with the hypoglossal nerve and then leave the hypoglossal nerve to form the supraclavicular nerves.

   c) Prevertebral fascia is between the phrenic nerve and the transverse cervical artery.

   d) The spine of the sphenoid bone is a site of attachment for the sphenomandibular ligament.

   e) The external laryngeal nerve passes through the thyrohyoid membrane with the external laryngeal artery.

   f) The ansa subclavia circles the brachiocephalic artery lateral to the branching of the vertebral artery.

3. **With regard to the skull, face, and scalp:**

   a) The transverse facial artery crosses the lateral side of the masseter muscle superior to the crossing of the parotid duct.

   b) Parietal emissary veins may spread infections from the “loose areolar space” of the scalp to the superior sagittal sinus.

   c) The temporal branch of the facial nerve provides GSA fibers to the mucosa of the maxillary sinus.

   d) The zygoma provides part of the lateral orbital wall and part of the zygomatic arch.

   e) The facial vein crosses the mandible posterior to the facial artery.

4. **With regard to the temporomandibular joint, temporal fossa, and infratemporal fossa:**

   a) The mylohyoid groove of the mandible is a site of origin for the mylohyoid muscle.

   b) Injury to the auriculotemporal nerve within the temporal fossa disrupts salivation from the parotid gland.

   c) The lesser superficial petrosal nerve passes from the tympanic cavity to the infratemporal fossa by way of either the foramen spinosum or the foramen ovale.

   d) The posterior superior alveolar artery does not pass through the pterygomaxillary fissure.

5. **With regard to the cranial fossae and dural sinuses:**

   a) The inferior petrosal sinus passes into the jugular foramen to enter the internal jugular vein.

   b) The foramen cecum of the skull provides a venous communication between the superior sagittal sinus and the nasal cavity.

   c) The straight sinus, inferior sagittal sinus, and the great vein of Galen meet at the tentorial notch.

   d) The basilar venous plexus is on the posterior surface of the clivus and communicates with the anterior internal vertebral plexus.

6. **With regard to the larynx, pharynx, and oral cavity:**

   a) The buccinator muscle and the superior constrictor muscle have a common site of attachment at the sphenomandibular raphe.

   b) The palatoglossus, salpingopharyngeus, and tensor veli palatini muscles are innervated by the vagus nerve.

   c) The gag reflex is mediated by the GVA component of the glossopharyngeal nerve.

   d) The palatine tonsils are located within the pharyngeal arches defined by the palatoglossus and salpingopharyngeus muscles.

Part III. Indicate your understanding of the following. (24 pts)

1. Apical root infections of the lower molars may erupt into the floor of the mouth. Infection may then spread into cervical spaces. Subsequent swelling may cause stridor and death. **Define the retropharyngeal space. (6 pts)**

2. The larynx provides a patent airway for respiration and a restricted airway for the Valsalva maneuver. Additionally, movements of the true vocal cords provide the basis for vocalization. **Review the anatomy of true vocal cord movments during sound production and respiration. (6 pts)**

3. The pharynx participates in swallowing and respiration. It is essential that swallowed contents do not enter the larynx. **Review the anatomy of pharyngeal movements during swallowing that separate the pathway of swallowed contents from the pathway of respiration. (6 pts)**

4. Damage to the lingual nerve disrupts GSA (touch, temperature, pain, and pressure) sensation to the tongue. SVA (taste) sensation and GVE (salivation) may be intact or not depending on where the lingual nerve is damaged. The patient may appreciate the sweetness, but not the temperature, of a sip of coffee. **Provide an anatomical account for the dissociation of the GSA, GVE, and SVA functional components supplying the tongue based on damage to the lingual nerve. (6pts)**

Part IV. Long Essay. (12 pts)

1. Viral infections of the air sinuses do not routinely become bacterial infections. Nonetheless, viral infections paired with decongestants may set the stage for a subsequent bacterial infection. **Review the anatomy of the maxillary air sinus. Include bones, contents, relationships, vasculature, innervation, and drainage. (12 pts)**

2. A treatment for trigeminal neuralgia involving the maxillary nerve is to inject nerve blocking agents into the pterygopalatine fossa. **Discuss the pterygopalatine fossa. Include contents, relationships, communications, nerve distributions, and the expected consequences of blocking each nerve and functional component within the pterygopalatine fossa. (12 pts)**

3. A 38 year-old male presents to the Emergency Department with a swollen left eye. He denies trauma to the eye. He initially reports having a headache “on the top of my head.” He now has a generalized headache, fever, pain behind his eye, and double vision. On exam, there is ptosis, proptosis, conjunctival injection, and inability to track with his left eye. He has hyperesthesia of his left face, from the forehead to just above the mandible. His fundoscopic exam displays papilledema. **Discuss the anatomy of the cavernous sinus. Include boundaries, contents, and relationships. Account for symptoms caused by damage to the structures and cranial nerve functional components within the cavernous sinus? (12 pts)**

4. A 27 year-old male medical student presents with complaints of left sided headache. He is convinced that he has a "brain tumor." He states that it is "worse in the morning." On exam, the patient has difficulty opening his mouth and his mandible deviates to the left side. His left external ear canal and tympanic membrane are normal in appearance and he has no hearing deficits on gross testing. There is tenderness anterior to the tragus of the left ear and "clicking" is appreciated with jaw opening. **Review the anatomy of the temporomandibular joint. Include bones, ligaments, muscles, movements and limitations of movement, relationships to surrounding structures, lymphatic drainage, and significance. (12 pts)**