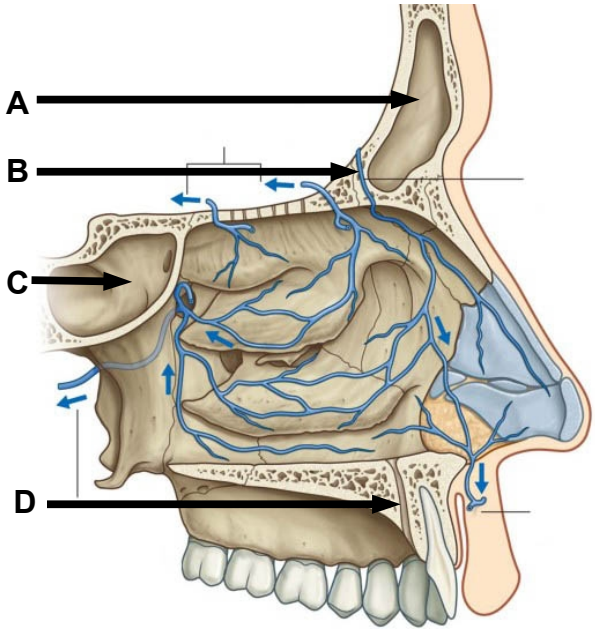
EXAM NUMBER_____

GRADUATE HUMAN GROSS ANATOMY – ANAT 503
EXAMINATION 7

December 11, 2020

PART I. Answer in the space provided. (14 pts)

1. **Identify the structures. (2 pts)**



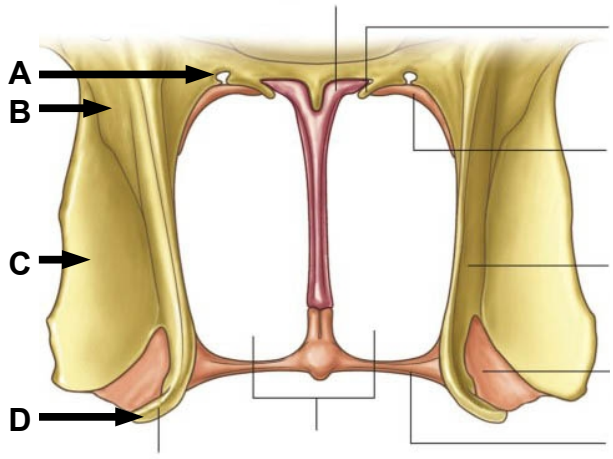
A) _____

B) _____

C) _____

D) _____

2. **Identify the structures. (2 pts)**



A) _____

B) _____

C) _____

D) _____

EXAM NUMBER_____

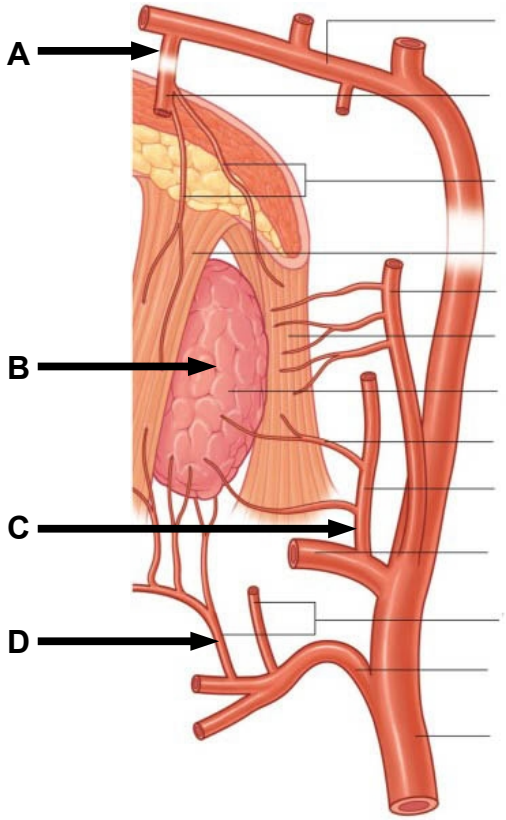
3. **Identify the structures. (2 pts)**

A) _____

B) _____

C) _____

D) _____



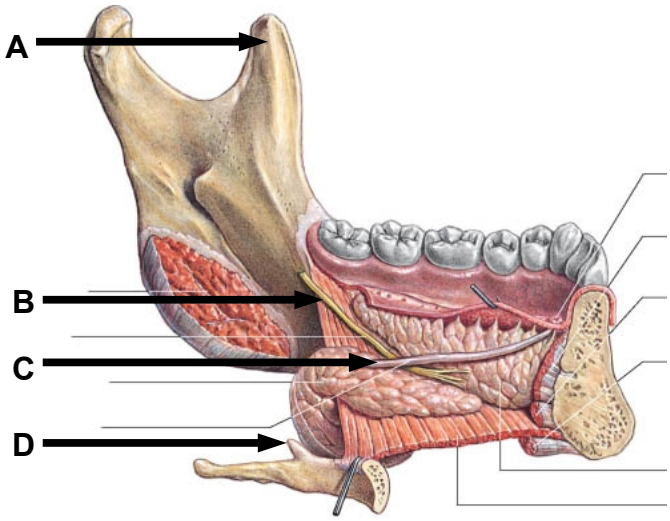
4. **Identify the structures. (2 pts)**

A) _____

B) _____

C) _____

D) _____



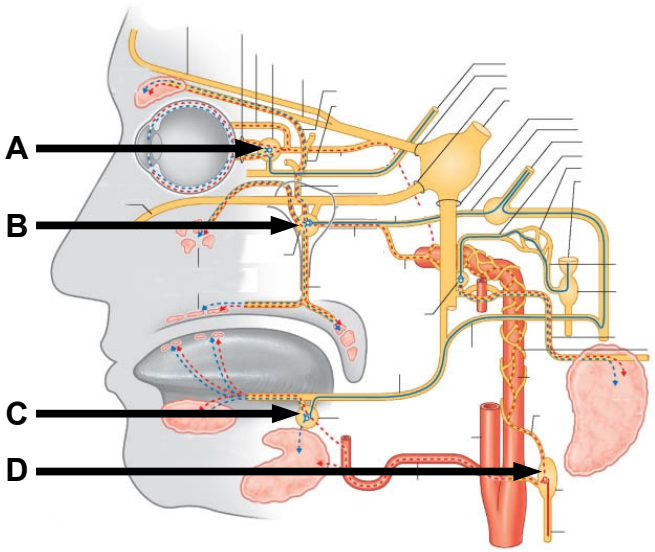
5. **Identify the structures. (2 pts)**

A) _____

B) _____

C) _____

D) _____



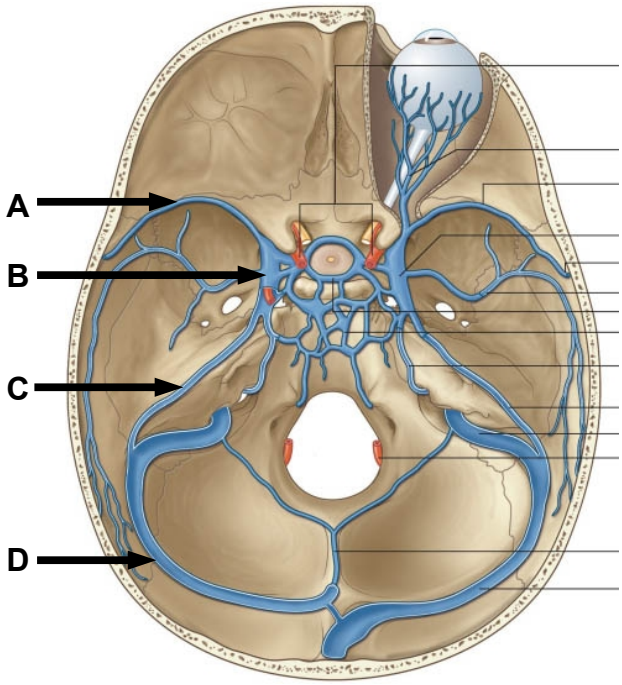
6. **Identify the structures. (2 pts)**

A) _____

B) _____

C) _____

D) _____



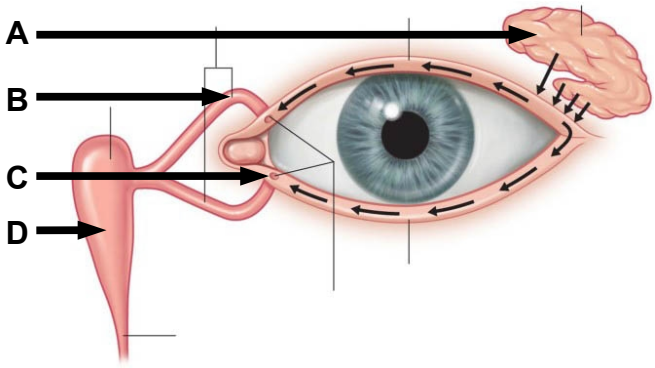
7. **Identify the structures. (2 pts)**

A) _____

B) _____

C) _____

D) _____



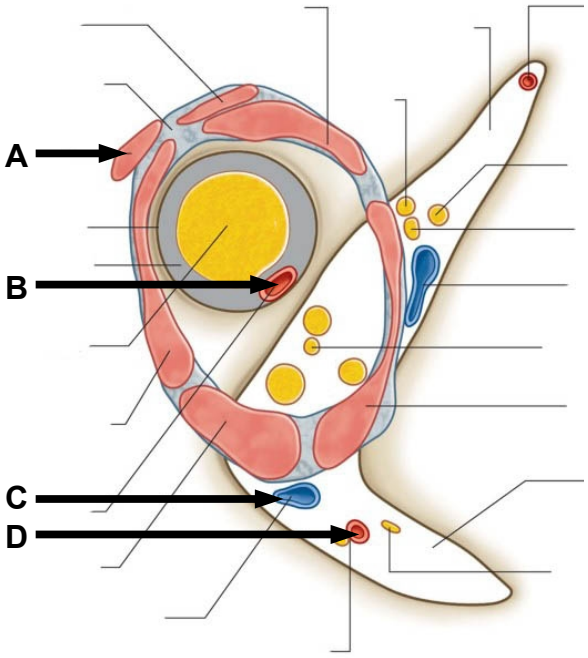
8. **Identify the structures. (2 pts)**

A) _____

B) _____

C) _____

D) _____



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

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

   a) The lesser superficial petrosal nerve passes through the tympanic canaliculus to enter the infratemporal fossa.

   b) Damage to the glossopharyngeal nerve at the jugular foramen weakens elevation of the oropharynx.

   c) Efferent fibers (Special Visceral Efferent) of the vagus nerve contribute to raising the pitch of the voice and to equalization of air pressure within the middle ear.

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

   e) A lesion of the facial nerve distal at the internal auditory meatus disrupts reflex lacrimation and salivation.

   f) Damage to the inferior division of the oculomotor nerve, proximal to the motor root of the ciliary ganglion, eliminates the pupillary light reflex on the side of the lesion.

2. **With regard to the triangles of the neck:**

   a) The transverse cervical nerve ascends along the posterior edge of the sternocleidomastoid muscle and provides sensory innervation to the region of the anterior triangle.

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

   c) Prevertebral fascia, at the anterior scalene muscle, passes anterior to the phrenic nerve and anterior to the transverse cervical artery.

   d) The anterior and posterior bellies of the omohyoid muscle are innervated by the ansa cervicalis.

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

   f) The right recurrent laryngeal nerve ascends across the anterior surface of the right subclavian artery.

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

   a) Tears of lacrimation enter the upper lateral conjunctival fornix and ultimately drain by way of the nasolacrimal duct into the middle nasal meatus.

   b) Condylar emissary veins may spread infections from the mastoid air cells to the posterior external vertebral plexus.

   c) The cervical branch of the facial nerve provides SVE fibers to the platysma.

   d) The greater wing of the sphenoid bone contributes to the pterion.

   e) The facial vein communicates with the cavernous sinus by way of orbital veins and the pterygoid venous plexus.

f) A “blowout” fracture of the orbital floor may entrap the inferior rectus muscle and sever the infraorbital nerve.

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

a) The mylohyoid line is followed by the nerve to mylohyoid.

b) Injury to the buccal nerve within the infratemporal fossa disrupts salivation from the parotid gland.

c) The greater superficial petrosal nerve passes from the middle cranial fossa to the pterygopalatine fossa by way of the pharyngeal canal.

d) The superior head of the lateral pterygoid muscle depresses the mandible.

e) Damage to the buccal nerve causes paralysis of the buccinator muscle.

f) Damage to the lingual nerve, at the foramen ovale, disrupts touch to the posterior one-third of the tongue.

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

a) The groove for the sigmoid sinus contributes to the medial wall of the mastoid air cells.

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

c) The inferior sagittal sinus and the great vein of Galen meet at the tentorial notch to form the crooked sinus.

d) The inferior petrosal sinus directly communicates with the basilar venous plexus and the cavernous sinus.

e) The deep petrosal nerve is located within the anterior cranial fossa near the apex of the petrous portion of the temporal bone.

f) The jugular foramen conveys the glossopharyngeal, vagus, spinal accessory, and inferior petrosal sinus from the middle cranial fossa to the base of skull.

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 pterygomandibular raphe.

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

c) The afferent limb of the gag reflex is mediated by the glossopharyngeal nerve.

d) The lingual tonsils are posterior to the palatoglossal arch and anterior to the palatopharyngeal arch.

e) The median and lateral glossoepiglottic folds border the vallecula.

f) The lateral cricoarytenoid muscle adducts the false vocal cord.

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

1. 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. (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 the posterior cricoarytenoid muscle. (6 pts)**

3. The posterior boundary boundary of the cavernous sinus is at the apex of the petrous part of the temporal bone. Thus, anatomical structures associated with this boundary may be perturbed if there is cavernous sinus infection. **Review the region of the apex of the petrous part of the temporal bone. What symptoms may present from infection of this region? (6 pts)**

4. A 27-year-old male patient presents with concerns of left sided headache. On exam, the patient has difficulty opening his mouth. The mandible deviates to the left side. His left external ear canal and tympanic membrane are normal in appearance and he has no hearing deficits. There is tenderness anterior to the tragus. There is "clicking" with jaw opening. **Review the anatomy of the temporomandibular joint. Include bones, contents, ligaments, muscles, movements and limitations of movement, innervation, relationships to surrounding structures, lymphatic drainage, and significance. (6 pts)**

5. Nasal, oral, pharyngeal, and laryngeal cancers may present with the chief concern of ear pain. **Review the sensory innervation to the ear that may mediate referred pain from the nasal cavity, oral cavity, pharynx, and larynx. (6 pts)**

Part IV. Essay. (36 pts)

1. 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 lateral forehead to the upper lip. His fundoscopic exam displays papilledema. **Discuss the anatomy of the cavernous sinus. Include boundaries, contents, and relationships. Account for symptoms caused by damage to structures within the cavernous sinus? (12 pts)**

2. An apical abscess of the lower molars may erupt into the floor of the mouth and then enter the submandibular space by way of the posterior free edge of the mylohyoid muscle. This infection may then erode into deeper cervical regions. **Discuss the spaces defined by the cervical fasciae. Include boundaries, contents, relationships, lymphatic drainage, and clinical significance. (12 pts)**

3. A seventy two year-old male comes to your office with complaints of hoarseness and postnasal drip. You note the distinct smell of tobacco. He has ptosis of the left eye and the left pupil is smaller than the right. There is fullness over the left supraclavicular region. A Pancoast tumor is highly suspected. **Discuss the anatomy of the left vertebral triangle. Include boundaries, contents, relationships, fascial specializations, vasculature, innervation, lymphatic drainage, and the clinical significance of damage to structures in the area. (12 pts)**