EXAM NUMBER_____

STRUCTURAL BASIS OF MEDICAL PRACTICE
EXAMINATION 7

October 23, 2009

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

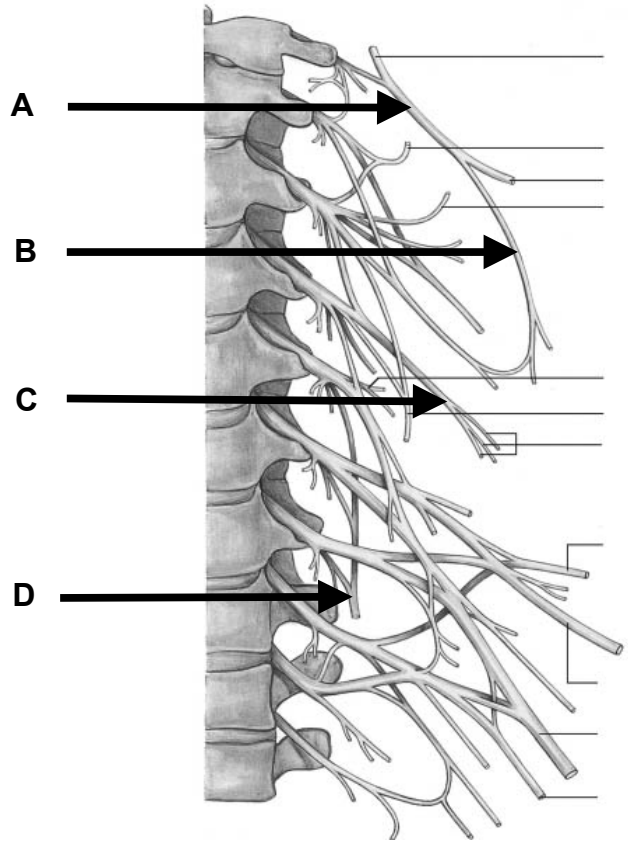
1. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



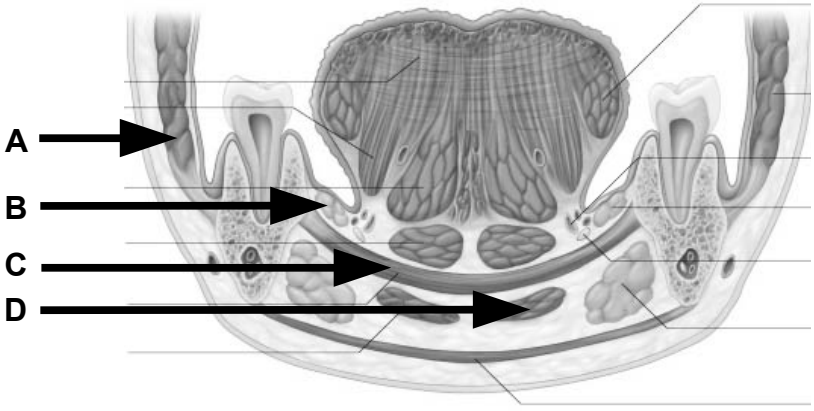
2. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



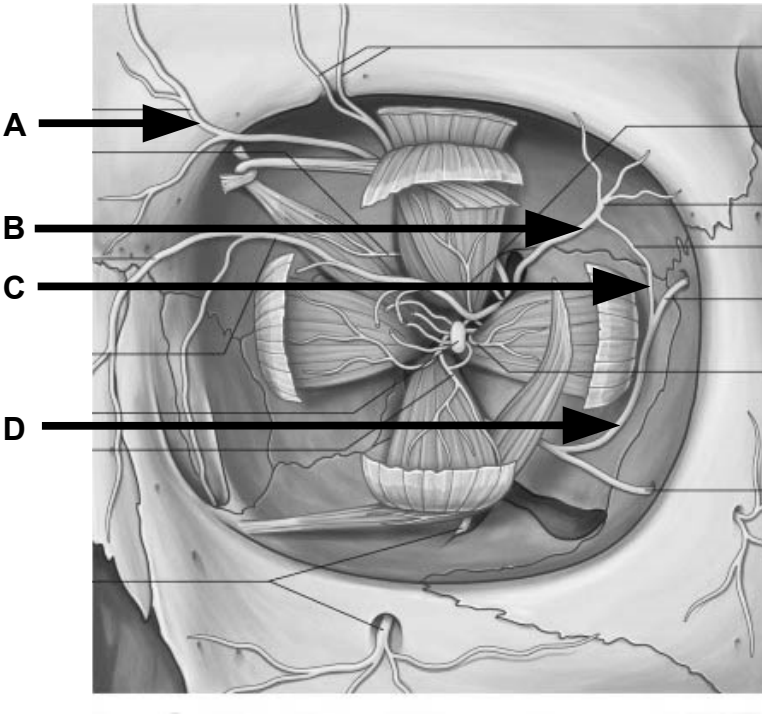
3. Identify the structures. (2 pts)

A._____

B. _____

C. _____

D. _____



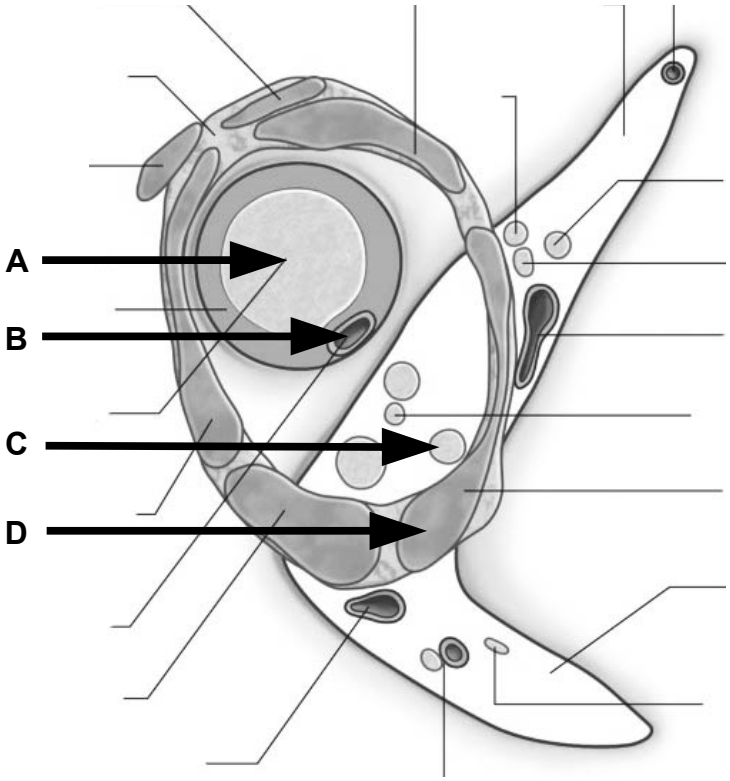
4. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



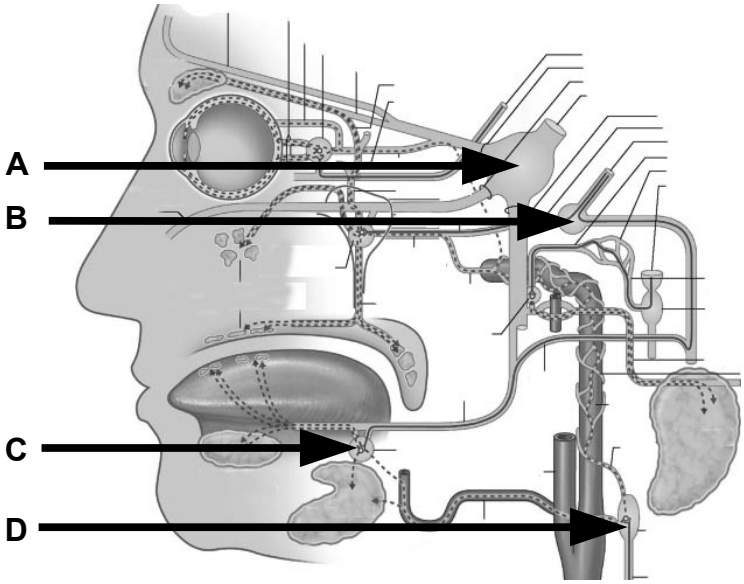
5. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



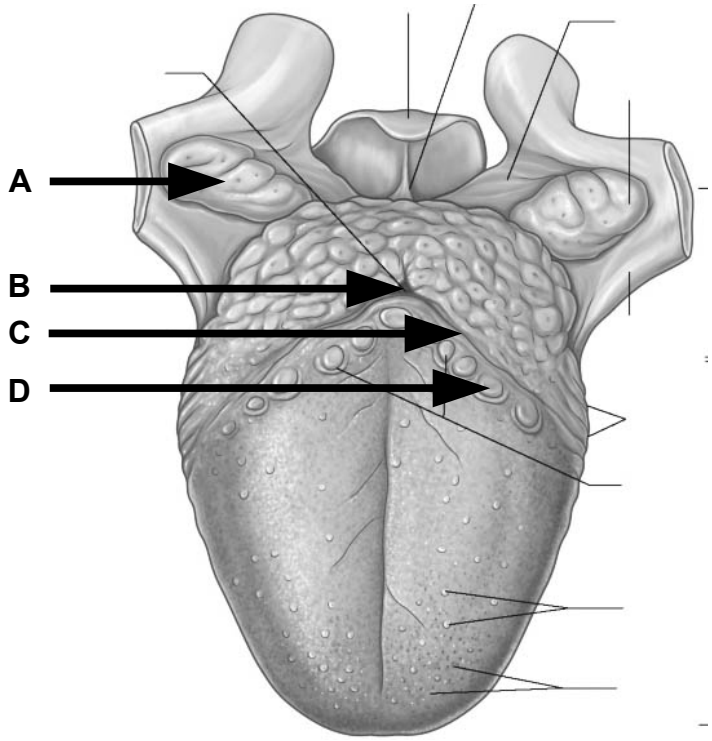
6. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



Part II. Circle the correct answer. All, none, or some may apply. (22 pts)

1. With regard to the cranial nerves:

    a. The olfactory nerve fascicles pass through the perpendicular plate of the ethmoid bone to enter the nasal cavity from the middle cranial fossa.

    b. A fracture of the cribriform plate of the ethmoid bone may cause paresthesia along the bridge of the nose and a disruption of olfactory sensation.

    c. An enlarging hypophyseal tumor may first compress the lateral fibers of the optic tracts and, thus, disrupt central vision.

    d. The central retinal artery and the ophthalmic artery accompany the optic nerve in passing through the superior orbital fissure.

    e. The inferior division of the oculomotor nerve conveys postganglionic parasympathetic GVE fibers destined for the ciliary ganglion and GSE fibers destined for the inferior oblique muscle.

    f. A lesion of the most proximal part of the inferior division of the of the oculomotor nerve causes pupil constriction.

    g. The trochlear nerve leaves the middle cranial fossa to enter the orbit by passing through the superior orbital fissure and then through the annulus tendineus (annulus of Zinn).

    h. The mandibular nerve conveys GSA and SVE functional components from the middle cranial fossa to the infratemporal fossa by way of the foramen ovale.

    i. A lesion of the lingual nerve at the foramen ovale causes loss of temperature, touch, and pain to the ipsilateral anterior two thirds of the tongue but does not result in a disruption of taste sensation.

    j. The nasociliary nerve provides a sensory root to the lacrimal nucleus.

    k. A lesion of the abducens nerve within the cavernous sinus causes the ipsilateral eye to be abducted.

    l. A lesion of the greater superficial petrosal nerve disrupts taste sensitivity to the hard palate, mucus secretion within the maxillary sinus, nasal cavity and nasopharynx, and tear secretion into the superior conjunctival fornix.

    m. A lesion of the deep petrosal nerve may cause nasal congestion and a runny nose.

    n. A lesion of the lingual nerve at the floor of the mouth disrupts touch, temperature, pain, taste and mucus secretion to the ipsilateral anterior two-thirds of the tongue.

    o. The SVE functional component of the trigeminal nerve mediates the elevation of the soft palate towards Passavant's ridge and the equalization of air pressure within the middle ear.

    p. The vestibulocochlear nerve conveys SVA fibers into the temporal bone by passing through the external auditory meatus.

    q. The tympanic branch of the glossopharyngeal nerve conveys GVE and GVA fibers to the tympanic cavity by passing through the mastoid canaliculus.

r. A lesion of the lesser superficial petrosal nerve disrupts watery, but not thick, salivary secretion from the submandibular gland.

s. Normal tearing in the presence of hyperacusis (sensitivity to loud sounds), a dry mouth, and paralysis of the ipsilateral facial muscles indicates a lesion of the facial nerve distal to the greater superficial petrosal nerve and proximal to the stapedial nerve.

t. A lesion of the superior laryngeal nerve disrupts high pitched vocalization and the cough reflex.

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

v. Bilateral lesions of the recurrent laryngeal nerves may lead to airway obstruction due to abduction of the true vocal cords.

w. A deviated protrusion of the tongue indicates a lesion of the hypoglossal nerve that is ipsilateral to the deviation.

x. Torticollis characterized by rotation of the head to the left, flexion, and right deviation may be treated by disrupting the right spinal accessory nerve.

2. With regard to the cervical fascia:

   a. The cervical investing fascia has posterior attachments to the cervical spinous processes, inferior attachments to the sternum, clavicle, and acromion, and superior attachments to the mandible and occipital bone.

   b. A penetrating wound to the palatine tonsillar fossa may penetrate the buccopharyngeal fascia and the external carotid artery.

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

   a. The ansa cervicalis is derived from the somatic nervous system whereas the ansa subclavia is derived from the autonomic nervous system.

   b. The superior laryngeal nerve and artery pass through the thyrohyoid membrane to supply the mucosa of the larynx.

   c. The dorsal scapular and long thoracic nerves pierce the middle scalene.

   d. The lateral supraclavicular nerves cross the sternocleidomastoid muscle in close proximity to the external jugular vein.

4. With regard to the skull, face, and scalp:

   a. An infection within the “loose areolar space” of the scalp may spread intracranial by way of parietal emissary veins.

   b. The buccal nerve, derived from the mandibular division of the trigeminal nerve, provides SVE fibers to the buccinator muscle.

   c. Skull fractures in the region of the pterion may rupture the anterior branch of the middle meningeal artery resulting in an epidural hematoma.

d. The cervical branch of the facial nerve is the primary source of motor innervation to the platysma muscle.

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

a. The clivus extends from the foramen magnum to the inferior margin of the tuberculum sellae.

b. The lateral walls of the sphenoid sinus are adjacent to the medial walls of the cavernous sinus.

c. The occipital sinus directly communicates with the anterior internal vertebral venous plexus and the basilar venous plexus directly communicates with the posterior internal vertebral venous plexus.

d. The foramen cecum, when patent, provides a direct venous communication between the superior sagittal sinus and the sphenoid sinus.

6. With regard to the pharynx and oral cavity:

a. SVA fibers from the lesser superficial petrosal nerve arrive at the hard and soft palate by traveling within the greater and lesser palatine nerve branches from the maxillary nerve.

b. The palatoglossus and salpingopharyngeus muscles are innervated by the vagus nerve.

7. With regard to the temporal bone and ear:

a. Excavation of the medial wall of the mastoid air cells may endanger the sigmoid sinus.

b. The ossicular chain is located primarily in the posterior superior quadrant of the middle ear.

c. The tensor tympani muscle is innervated by SVE fibers from the trigeminal nerve and the stapedius muscle is innervated by GSE fibers from the facial nerve.

d. A lesion of the facial nerve as it enters the parotid gland is expected to reduce salivation.

Part III. Indicate your understanding (characteristics, importance, function, relationships, boundaries and/or contents) of the following. Answer in the space provided. (30 pts)

1. Retropharyngeal space. (6 pts)

2. True vocal cord. (6 pts)

3. Anterior scalene muscle. (6 pts)

4. Ciliary ganglion. (6 pts)

5. Hyoglossus muscle. (6 pts)

Part V. Answer in the space provided (including the back of the page or the additional pages for each question). (36 pts)

1. A 38 year-old male presents to the E.D. with a swollen left eye. He denies any trauma to the eye. He does report, initially, having a headache "on the top of my head." He now has a generalized headache, fevers, pain behind his eye, and if you open his eyelid he reports double vision. On exam, the patient appears ill with obvious ptosis, proptosis, and inability to track with his left eye during extra-ocular muscle testing. He has hyperesthesia on the skin 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. What symptoms are caused by damage to the structures and cranial nerve functional components within the cavernous sinus? (12 pts)**

2. A 27 year-old male medical student presents with complaints of left sided headache. He has been studying for an upcoming neuroanatomy exam and is now convinced that he has a "brain tumor." He states it is "worse in the morning" and thinks it might be affecting his hearing because he has noted some pain in his left ear. On exam, the patient has some difficulty opening his mouth and it appears that 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. When you palpate anterior to the tragus of the left ear it is tender and there is a "clicking" appreciated with jaw opening. **Review the anatomy of the temporomandibular joint and infratemporal fossa. Include bones, boundaries, contents, bony communications, ligaments, muscles, movements and limitations of movement, vasculature and venous communications, innervation and functional components, relationships to surrounding structures, lymphatic drainage, and significance. (12 pts)**

3. A 72 y.o.m. comes to your office with complaints of hoarseness. He has noticed it for three weeks. He thinks he has “allergies” causing some post nasal drip that has resulted in his hoarseness. His only other complaint is some blurred vision. On exam, you note the distinct smell of tobacco. He has lid lag of the left eye and the exam of the pupil is unequal – the left being smaller than the right. **Discuss the anatomy of the sympathetic nervous system for the head and neck. Include preganglionic and postganglionic cell body locations, anatomical pathways and distributions, and significance. Include an account of Horner's syndrome (sympathetic denervation of the head). (12 pts)**