**Question 1**

Which of the following cranial foramina and contents is INCORRECT?

A Foramen rotundum = Ophthalmic nerve (CN V1)

B Jugular foramen = CN X

C Foramen spinosum = Middle meningeal artery

D Foramen ovale = Mandibular nerve (CN V3)

Explanation A

This question was created to ensure you review all the cranial foramina and their contents. An EMQ is easily created. Note the bones of the cranium which create the foramina as well.

Foramen rotundum = Maxillary nerve (CNV2)

**Question 2**

Which fascia encloses the retropharyngeal space anteriorly?

A Investing fascia

B Alar fascia

C Deep cervical fascia

D Buccopharyngeal fascia

Explanation D

The retropharyngeal space (RPS) is the largest and most important interfacial space in the neck. This potential space consists of loose connective tissue between the visceral part of the prevertebral layer of the deep cervical fascia and the buccopharyngeal fascia (pre-tracheal layer) surrounding the pharynx superficially. The alar fascia forms a further subdivision of the retropharyngeal space. The RPS permits movement of the pharynx, oesophagus, larynx and trachea relative to the vertebral column during swallowing. The space s closed superiorly by the cranial base and on each side by the carotid sheath. It opens inferiorly into the superior mediastinum.

**Question 3**

A man is punched in the right orbital region. He complains of numbness to his right cheek. Which nerve has been affected?

A Facial

B Maxillary

C Ophthalmic

D Trochlear

Explanation B

Cutaneous nerves derived from the maxillary nerve (CNV2)

Infrarorbital- mucosa of maxillary sinus. Premolar, canine and incisor maxillary teeth. Skin and conjunctiva of inferior eyelid. Skin of check, lateral nose and antero- infero nasal septum. Skin and oral mucosa of superior lip

Zygomaticofacial- skin on prominence of cheek

Zygomaticotemporal- hairless skin anterior part of temporal fossa

**Question 4**

Which zone of the neck is most commonly injured following a penetrating trauma?

A Zone Ia

B Zone III

C Zone I

D Zone II

Explanation D

There are 3 zones of the neck. The zones give the doctors an understanding of the structures that are at risk with penetrating neck injuries.

Injuries to zones I and III- obstruct the airway; have the greatest risk of morbidity and mortality.

Zone II is the most common injured zone. Morbidity and mortality are lower because the doctor can control vascular damage with direct pressure and the structures can be visualised and treated more easily by the surgeons

Zone I- root of the neck, extends form clavicle and the manubrium to the level of the inferior border of the cricoid cartilage. Structures at risk include the cervical pleurae, lung apices, thyroid and parathyroid glands, trachea, oesophagus, common carotid artery, jugular veins and the cervical region of the vertebral column.

Zone II- extends form cricoid cartilage to the level of the angle of mandible. Structures at risk include superior pole of thyroid gland, thyroid and cricoid cartilage, larynx, laryngopharynx, carotid arteries, jugular veins, oesophagus and the cervical region of the vertebral column

Zone III- occurs at the angle of the mandible superiorly. Structures at risk include the salivary glands, oral and nasal cavities, oropharynx and nasopharynx.

**Question 5**

The infra-orbital nerve innervates all of the following parts of the face EXCEPT?

A Mucosa of incisor maxillary teeth

B Dorsum and apex of the nose

C Conjunctiva of the inferior eye lid.

D Skin of the oral mucosa of superior lip

Explanation B

The infra-orbital nerve innervates the mucosa of the maxillary sinus. Mucosa of the premolar, canine and incisor maxillary teeth. Skin and conjunctiva of the inferior eye lid. Skin of the cheek, lateral nose and anteroinferior nasal septum. Skin of the oral mucosa of superior lip.

The alae of the nose are supplied by the nasal branches of the infraorbital nerve V2

The dorsum and apex of the nose is supplied by the CN V1 (via the infratrochlear nerve and the external nasal branch of the anterior ethmoidal nerve). The anterior superior portion is also supplied by the CN V1 (ophthalmic) via the anterior and posterior ethmoidal nerves.

Note: Innervation of the teeth: by the superior alveolar nerves form the maxillary nerve (V2). The lower teeth by the inferior alveolar branch of the mandibular nerve (V3)

**Question 6**

A young man is stabbed in the face, he sustains a jagged laceration extending form the mouth to the angle of the mandible. He presents to your ED with paralysis of muscles of the lower lip. Which nerve is most likely injured?

A Marginal mandibular branch

B Buccal marginal mandibular branch

C Zygomatic marginal mandibular branch

D Temporal marginal mandibular branch

Explanation A

Injury to the marginal mandibular branch of the CN VII may occur following an incision occurring along the inferior border of the mandible. Injury causes injury to the risoirus muscle, nad muscles of the lower liup and chin (mentalis, depressor labii inferioris and depressor anguli oris)

The buccal branch of the facial nerve supplies the muscles of the upper lip (upper parts of the orbicularis oris and inferior fibres of levator labii superioris)

Note: the prescribed textbook does not actually state which nerve innervates the lower part of the orbicularis oris. All sources report that this muscle is innervated by the buccal branch of the CN VII only.

**Question 7**

Which is true regarding the development of the cranium?

A The two halves of the mandible at birth fuse by the 5th year of life

B The bones of the calvaria and cranial base develop by intramembranous ossification only

C Eruption of permanent teeth is complete by year 15.

D The sternocleidomastoid muscles help complete the development of the mastoid processes, which are absent at birth

Explanation D

The bones of the calvaria and some parts of the cranial base develop by intramembranous ossification. Most parts of the cranial base develop by endochondral ossification. The facial aspect of the newborn is small compared to the calvaria (skull)-approximately one eighth of the cranium (because of the precocious growth and development of the brain and eyes). The adult facial skeleton forms one third of the cranium. There are no mastoid processes at birth, they form gradually during the first year of life as the sternocleidomastoid muscles complete their development and pull on the mastoid parts of the temporal bones. The mandible of the newborn consists of two halves of which the union begins in the first year and fusion occurs by the end of the second year. Eruption of permanent teeth is not complete until early adulthood. Growth of the face is associate with enlargement of the paranasal sinuses which adds to the final shape of the face and resonance to the voice

**Question 8**

Which muscle controls vocal cord abduction in the larynx?

A Lateral cricoarytenoid

B Transverse arytenoid

C Aryepiglottic

D Posterior cricoarytenoid

Explanation D

The posterior cricoarytenoid muscle is the most important muscle of the larynx as it is the only muscle that abducts the vocal folds and opens the glottis

**Question 9**

What structure passes through the foramen spinosum

A Facial nerve

B Internal carotid artery

C Middle meningeal artery

D Mandibular branch of the trigeminal nerve

Explanation C

The mandibular branch of the trigeminal nerve passes through the foramen ovale and the facial nerve passes through the internal acoustic maetus. Regarding the foracem lacerum, some sources say that the internal carotid artery emerges through a part of the foramen lacerum that is not occluded by cartilage. However, for the ACEM exams: the internal carotid artery and its accompanying sympathetic and venous plexuses actually pass horizontally acorss (rather than vertically through) the area of the foracem lacerum, an artifact of dry crania, which is closed by cartilage in life.

The Internal Carotid Arteries enter the cranial cavity through the carotid canal, in the petrous part of the temporal bone. The Facial Nerves emerge from the cranium through the stylomastoid foramen, located between the mastoid and styloid processes. The Mandibular Nerves (CN V3), are formed by the union of sensory fibres from the sensory ganglion on the motor root of CN V in the foramen ovale, in the greater wing of the sphenoid, through which CN V3 emerges from the cranium. The Middle Meningeal Arteries, branches of the maxillary arteries, enter the floor of the middle cranial fossa through the foramen spinosum, run laterally in the fossa, and turn supero-anteriorly on the greater wing of the sphenoid, where it divides.

**Question 10**

Which structure does not travel through the jugular foramen?

A Hypoglossal nerve

B Accessory nerve

C Vagus nerve

D Glossopharyngeal nerve

Explanation A

The hypoglossal nerve passes through the hypoglossal canal.

**Question 11**

Regarding the internal jugular vein, which of the following statements is correct?

A It runs from the angle of the jaw to the proximal end of the clavicle

B It runs deep to the two heads of sternocleidomastoid

C It runs in close proximity to the thoracic duct

D It lies medial to the carotid artery

Explanation B

the internal jugular vein runs from the ear lobe to sternal angle of the clavicle. It lies lateral to the carotid artery and the duct crosses behind it on the left.

**Question 12**

Regarding the gag reflex, which of the following statements is correct?

A Vagus nerve for efferent and afferent

B Glossopharyngeal nerve for afferent, vagus nerve for efferent

C Maxillary nerve for afferent, vagus nerve for efferent

D Hypoglossal nerve for afferent, vagus nerve for efferent

Explanation B

The gag refles occurs when the palate, tonsil and posterior pharyngeal wall are touched by an unfamiliar object, as when testing with a swab. The passage of food over the same area does not cause the reflex, due to conditional familiarity. The afferent side of the reflex is via the glossopharyngeal nerve to the nucleus of the tractus solitarius, and the efferent side is via the vagus.

**Question 13**

Which of the following structures is not involved in vocal cord movement?

A Posterior cricoarytenoid

B Vocalis

C Aryepiglottics

D Thyroarytenoid

Explanation C

The aryepiglottics approximate the aryepiglottic folds and close the laryngeal inlet.

Although the aryepiglottic muscle is formed by same fibres form the oblique arytenoids-continuing form the arytenoid apex into the aryepiglottic fold, reaching the the edge of the epiglottis. They do not cause any action on the vocal cords. They act more like sphincters and closs the laryngeal inlet in the presence of liquids or particles

All other options below including transverse and oblique arytenoids, lateral cricoarytenois and cricothyroid muscles either stretch, relax, tense, abduct, adduct vocal ligaments and folds

**Question 14**

After a tonsillectomy, a patient complains of loss of taste from the posterior tongue. Which nerve has been damaged?

A Hypoglossal

B Glossopharangeal

C Vagus

D Lingual

Explanation B

The facial nerve is involved in the anterior taste of the tongue.

Note: - The facial nerve supplies the anterior 2/3 of the tongue via the chorda tympani (VII) - for special taste sensations.

The lingual nerve (V3) also supplies the anterior 2/3 of the tongue- for touch and temperature.

The lingual branch of glossopharyngeal nerve (IX) supplies the posterior 1/3 of the tongue- for both general and special taste sensations.

Vagus nerve ALSO supplies fibres to a small section of the posterior 1/3 of the tongue, via the internal laryngeal nerve (X)- for both general and special sense.

**Question 15**

Which of the following bones makes up part of the roof of the orbit?

A Temporal

B Frontal

C Ethmoid

D Maxillary

Explanation B

The orbital surface of the frontal bone is the true roof

Note: in the current texts it is noted that the superior wall of the orbit (roof) is formed mainly by the orbital part of the frontal bone. Near the apex of the orbit, the lesser wing of the sphenoid forms the superior wall.

**Question 16**

Which of the following is a branch of the anterior division of the mandibular nerve?

A zygomaticotemporal

B infraorbital

C Lateral pterygoid

D infratrochlear

Explanation C

Anterior divison branches include the deep temporal branches, masseteric branches, lateral pterygoid and buccal. Posterior division branches include the auriculotemporal, inferior alveolar and lingual chorda tympani

Note the lingual chorda tympani is a branch of CN VII (facial) which branches within the facial canal of the temporal bone. The chorda tympani travels through the middle ear, posterior to anterior passing between incus and malleus. It enters infratemporal fossa and joins with fibres of CN V3, Mandibular nerve.

**Question 17**

Which nerve is not contained within the carotid sheath?

A Vagus nerve

B Upper part of the hypoglossal nerve

C Cervical sympathetic trunk

D Upper part of the accessory nerve

Explanation C

The four major structures contained in the carotid sheath are:

* The common caoritd and internal carotid arteries
* Internal jugular vein
* Vagus nerve (CN X)
* Deep cervical lymph nodes

Other structures: carotid sinus nerve and sympathetic nerve fibres (carotid periarterial plxuses)

The carotid artery lies medial to the internal jugular vein, and the vagus nerve is situated posteriorly between the two vessels.

In the upper part, the carotid sheath also contains the glossopharyngeal nerve (CNIX), the accessory nerve (CNXI, and the hypoglossal nerve (CNXII) which pierce the fascia of the carotid sheath.

The ansa cervicalis is embedded in the anterior wall of sheath. It is formed by "descendens hypoglossi" (C1) and "descendens cervicalis" (C2-C3).

**Question 18**

Which of the following structures exits the skull through the stylomastoid foramen?

A Occipital artery

B Facial nerve

C Temporal artery

D Trigeminal nerve

Explanation B

The stylomastoid foramen is the termination of the facial canal and transmits the facial nerve and stylomastoid artery.

**Question 19**

The posterior triangle of the neck contains all of the following except?

A cervical lymph nodes

B Accessory nerve

C Superior belly of omohyoid

D Cervical plexus

Explanation C

The boundaries of the lateral cervical region/posterior triangle are: sternocleidomastoid, trapezius and clavicle.

The contents of the posterior triangle are:

Muscles: splenius capitus, levator scapulae, middle scalene, posterior scalene.

Arteries: lateral branches of the thyrocervical trunk, subclavian (3rd part), suprascapular artery, cervicodorsal trunk, superficial cervical artery, dorsal scapular artery.

Veins: external jugular vein, subclavian vein, (cervicodorsal vein, suprascapular vein and anterior jugular vein filter into the EJV)

Nerves: spinal accessory nerve, roots of the brachial plexus, suprascapular nerve, roots of the cervical plexus, superior and inferior root of the ansa cervicalis, cutaneous branches of the cervical plexus-lesser occipital, great auricular, transverse cervical and supraclavicular nerves. It also contains the phrenic, accessory phrenic nerves and deep motor branches of the cervical plexus

Lymph nodes: superficial and deep cervical lymph nodes

The superior belly of the omohyoid muscle is found in the anterior cervical region

Note: in older textbooks and web sources, the occipital nodes seem to lie in the posterior triangle. The number is small-2 to 3. Current texts do not reflect this.

The superior belly of the omohyoid muscle is found in the anterior cervical region

**Question 20**

Which of the following is not a branch of the opthalmic nerve?

A infratrochlear nerve

B infraorbital nerve

C Supratrochlear nerve

D Supraorbital nerve

Explanation B

The following are the branches of the ophthalmic nerve. There are 5 cutaneous branches which are the lacrimal nerve, supraorbital nerve, supratrochlear nerve, infratrochlear nerve, and external nasal nerve.

**Question 21**

Regarding cerebral veins which of the following statements is correct?

A They do not follow the arterial pattern

B The veins lie subdurally

C They are thin walled and have valves

D The great cerebral vein drains into the cavernous sinus

Explanation A

The cerebral veins are thin walled and have no valves. They emerge in the brain and lie in the subarachnoid space. They pierce the arachnoid matter and the meningeal layer in the dura and drain into the cranial venous sinuses. The venous return does not follow the arterial pattern. Unlike the cortical arteries, which tend to travel deep in the sulci, the cortical veins tend to travel superficially; adherent to the deep surface of the arachnoid mater that bridges each sulcus.

The cavernous sinus, a large venous plexus, is located on each side of the sella tursica on the upper surface of the body of the sphenoid, which contains the sphenoid sinus. It receives blood form the superior and inferior ophthalmic veins, superior middle cerebral vein, and sphenoparietal sinus.

The great cerebral vein together with the inferior sagittal sinus forms the straight sinus, which joins the confluence of sinuses, which drains, into the transverse sinuses.

**Question 22**

Which of the following opens into the inferior meatus of the nose?

A Inferior alveolar nerve

B Ethmoidal sinus

C Nasolacrimal duct

D Frontal sinus

Explanation C

The nasolacrimal duct, 2cm long, slopes downwards, backwards, and laterally in conformity with the pear shaped nasal cavity, to open high up in the anterior part of the inferior meatus, 2cm behind the nostril

**Question 23**

The contents of the posterior triangle of the neck include which of the following?

A Occipital lymph nodes

B Second part of the subclavian artery

C Cervical plexus

D Superior belly of omohyoid muscle

Explanation C

See answer to Question 19

**Question 24**

Which of the following cranial nerves are not mixed nerves (both sensory and motor)

A CN VI

B CN VII

C CN X

D CN IX

Explanation A

CN: V, VII, IX, X are mixed nerves with both somatic motor and somatic sensory components.

CN III, IV, VI, XI, XII and the motor root of CN V are considered to be pure motor nerves that appear to have evolved from primordial anterior roots

A cute way to remember it: "Some Say Marry Money, But My Brother Says Big Bras Matter Most"

S= Sensory M= Motor B=Both/Mixed motor and sensory.

**Question 25**

Which of the following muscles controls vocal cord abduction in the larynx?

A Aryepiglottic

B Posterior cricoarytenoid

C Thyroarytenoid

D Cricothyroid

Explanation B

The posterior cricoarytenoid muscle is the most important muscle of the larynx as it is the only muscle that abducts the vocal folds and opens the glottis.

Aryepiglottic- approximates the aryepiglottic folds and closes the laryngeal inlet

Cricothyroid- its contraction makes the thyorid tilt slightly dowwards and forwards, thereby lengthening and tensing the vocal ligament

Thyroarytenoid- shortens and relaxes the vocal ligament, altering the pitch of the voice

**Question 26**

Cell bodies for the motor supply of the facial nerve lie in which of the following areas?

A Hypothalamus

B Midbrain

C Floor of third ventricle

D Pons

Explanation D

The motor nucleus of the facial nerve is a brachiomotor nucleus in the venterolateral part of the pons, while the cell bodies of the primary sensory neurons are in the geniculate ganglion. The central processes involved in taste end in the nuclei of the solitary tract in the medulla. Processes concerned with general sensations (thermal, pain, touch) end in the spinal nucleus of the trigeminal ganglion.

Note: the rules of four: first 4 nerves in midbrain, next 4 in pons and last 4 in medulla.

The rule of 4 of the brainstem: a simplified method for understanding brainstem anatomy and brainstem vascular syndromes. It is available on the Web

**Question 27**

The infratrochlear nerve supplies which of the following areas?

A Upper incisors

B Labial portion of the gum

C Skin of the lower eyelid

D Bridge of the nose

Explanation D

The infratrochlear nerve passes forward on the medial wall of the orbit just below the trochlea, supplies the lacrimal sac and conjuctiva, and continues above the medial palpebral ligament to the skin of the upper eye lid and bridge of the nose

**Question 28**

Corneal sensation pathway involves which ganglion?

A Geniculate

B Optic

C Trigeminal

D Ciliary

Explanation C

The cornea is supplied by the short (mainly) and long ciliary nerves. To elicit the corneal reflex, touch the cornea (not the conjunctiva) with a wisp of cotton wool. A normal positive response is a blink (both eyes should shut). Absence of the response suggests a lesion of CN V1. A lesion of CN VII (the motor nerve to the orbicularis oculi) may also impair this reflex. The pathway is via the trigeminal ganglion to the main sensory nucleus, whence impulses pass by the way of the reticular formation to reach both facial nerve nuclei and so stimulate both orbicularis oculi to close the lids on both sides.

Extra: Corneal sensation is carried from the eye to the brain via the ophthalmic division of the trigeminal nerve. Fibres first travel to the ciliary ganglion via the short ciliary nerves.. These sensory fibres do not synapse in the ciliary ganglion (unlike the parasympathetic efferents controlling the sphincter pupillae and ciliary body). Instead they pass through it, and on to the trigeminal ganglion where their cell bodies lie. The fibres continue, now joined by sensory fibres from the maxillary and mandibular divisions, to enter the brain stem where they synapse with the mesencephalic, chief sensory, and spinal nuclei. As they are sensory somatic fibres, they do not synapse outside of the CNS.

The old question read: corneal sensation synapses in which ganglion?

**Question 29**

All the following are branches of the external carotid except?

A Hypoglossal artery

B Lingual artery

C Ascending pharyngeal artery

D Facial artery

Explanation A

Before the external carotid enters the parotid gland, it gives off six branches, three from in front, two from behind and one deep (medial). In front are the superior thyroid artery, lingual artery and facial artery. Behind are the occipital artery and the posterio-auricular artery. Medially is the ascending pharyngeal artery.

A nice mnemonic for the branches of the external carotid artery:

Some Anaesthetists Like Fun Others Prefer S and M Superior Thyroid artery Ascending pharyngeal artery Lingual artery Facial artery Occipital artery Posterior Auricular artery Superficial temporal artery Maxillary artery

**Question 30**

While transversing the temporal bone within the facial canal, CN VII gives rise to following nerves except?

A Greater pertrosal nerve

B Nerve to the stapedius

C Deep petrosal nerve

D Chorda tympani nerve

Explanation C

The facial nerve first gives off the greater petrosal nerve in the temporal bone. The deep petrosal nerve is the nerve that the greater petrosal nerve JOINS medially at the foramen lacerum, to form the nerve of the pterygoid canal. The deep petrosal nerve contains sympathetic fibres from the carotid plexus of the internal carotid artery.

**Question 31**

Which of the following is a branch of the mandibular nerve?

A Infraorbital nerve

B External nasal nerve

C Auriculotemporal nerve

D Zygomaticofacial nerve

Explanation C

The buccal, lingual nerve, inferior alveolar nerve, nerve to mylohyoid, inferior dental plexus and mental nerves are also branches of the mandibular nerve

**Question 32**

The alar ligaments connect which of the following structures?

A Bodies of the axis to foramen magnum

B Dens to foramen magnum

C Tips of adjacent spinous processes

D Adjacent vertebral bodies posteriorly

Explanation B

The alar ligaments extend from the sides of the dens to the lateral margins of the foramen magnum. The weak apical ligament joins the apex of the dens to the anterior margin of the foramen magnum and is a fibrous remnant of the notochord

**Question 33**

All the following are boundaries of the named triangles with the exception of?

A Muscular and carotid triangles

B Muscular and digastric triangles

C Digastric and carotid triangles

D Digastric and submental triangles

Explanation B

The submental triangle, inferior to the chin, is a suprahyoid area bounded inferiorly by the body of the hyoid and laterally by the right and left anterior bellies of the digastric muscles. the apex of the submental triangle is at the mandibular symphysis.

The mandibular triangle/digastric triangle boundaries include mandible, anterior and posterior bellies of digastric

The carotid triangle: sternocleidomastoid, posterior belly of digastric and superior belly of omohyoid

Muscular triangle: sternocleidomastoid, superior belly of omohyoid and midline from hyoid bone to jugular notch

**Question 34**

Which is true regarding subarachnoid cisterns?

A Ambient cistern is continous posteriorly with the quadrigeminal cistern

B Chiasmatic cistern is inferior and posterior to the optic chiasm

C Pontocerebellar cistern is the largest cistern

D Ambient cistern contain parts of the great cerebral vein

Explanation A

Subarachnoid cisterns are openings in the subarachnoid space created by a separation of the arachnoid and pia mater. They contain CSF and soft tissue structures that anchor the brain. The cisterns are usually named according to the structures related to them.

Cerebellomedullary cistern-the largest of the cisterns located between the cerebellum and the medulla and receives CSF from the apertures of the 4th ventricle. It divides into a medial and lateral cerebellomedullary cistern.

Pontocerebellar cistern-an extensicve space ventral to the pons Interpeduncular cistern-located in the interpeduncular fossa

Chiasmatic cistern-inferior and anterior to the optic chiasm, the point of crossing of optic nerve fibres

Quadrigeminal cistern-contains parts of the great cerebral vein

Ambient cistern-located on the lateral aspect of the midbrain and is continuous posteriorly with the quadrageminal cistern.

**Question 35**

Regarding the ventricles of the brain, which is incorrect?

A The choroid plexuses are not found in the 4th ventricle

B The cerebral aqueduct connects the third and fourth ventricles

C CSF drains form the 4th ventricle via the foramen of Magendis and Luschka into the subarachnoid space

D The lateral ventricles consist of a body and anterior, posterior and inferior horns

Explanation A

Cerebrospinal fluid is produced by the choroid plexuses found in the lateral, third and fourth ventricles. The lateral ventricles consist of a body and anterior, posterior and inferior horns and each ventricle drains into the 3rd ventricle through the interventricular foramina. The CSF drains into tthe 4th ventricle via the cerebral aqueduct. It then drains into the subarachnoid space via the median foramen (of Magendie) and the two lateral foramens (of Luschka).

**Question 36**

Which is not a common branch of the basilar artery?

A Anterior inferior cerebellar artery

B Pontine branches

C Superior cerebellar

D Labyrinthine artery

Explanation D

The basilar artery is formed by the intracranial parts of the vertebral arteries that unite at the caudal border of the pons. The basilar artery runs up infront of the pons. The basilar artery is so named because of its close relationship to the cranial base. It ends by dividing into the two posterior cerebral arteries. The labyrinthine artery is a long slender branch of the anterior inferior cerebellar artery (85%-100% cases) or basilar artery (<15% cases).

**Question 37**

Features of the scalp include all EXCEPT?

A The auriculotemporal and occipital nerves innervate the posterior part of the scalp

B There are no lymphnodes within the scalp

C Arterial supply is by the internal and external carotids

D The arteries and nerves run in the second layer of the scalp

Explanation A

The scalp extends from the supraorbital margins anteriorly to the highest nuchal lines at the back of the skull and down to the ears and zygomatic arches at the sides. The composition of the scalp-it has five layers: SCALP= skin, connective tissue, aponeurosis with muscles at the front and back, loose areolar tissue and pericranium. Blood vessels and nerves run in the second layer (the dense connective tissue). The muscles of the scalp-the occipitalis and frontalis are supplied by posterior auricular branch and temporal branch respectively. The blood supply is derived from the external carotid artery by the occipital, posterior auricular and the superficial temporal branches, and from the internal carotid artery by the supratrochlear and supraorbial branches. All these arteries anastomose freely with each other. They are attached to the dense connective tissue of the second layer of the scalp and tend to be held open and bleed profusely when cut. There are no lymph nodes within the scalp. Drainage is via the occipital and posterior auricular nodes form the posterior scalp and the preauricular (parotid) nodes anteriorly. Nerve supply: posteriorly is the greater occipital nerve and third occipital nerves. Lesser occipital nerve supplies skin behind the ear. The temple by the auriculotemporal and the zygomaticotemporal nerves and the forehead by the supratrochlear and supraorbital nerves

Note: The muscles of the scalp-the occipitalis and frontalis are supplied by posterior auricular branch and temporal branch respectively

**Question 38**

Regrading the anterior spinal artery, which is CORRECT?

A It is a branch of the vertebral or posterior inferior cerebral artery

B The artery supplies the anterior grey and white columns of both sides

C There are two anterior spinal arteries and one posterior spinal artery that supply the spinal cord

D It is uniform in size throughout the length of the spinal cord

Explanation B

The spinal cord is supplied by the (single) anterior and (right and left) posterior spinal arteries that descend from the level of the foramen magnum and form three longitudinal channels form which branches enter the cord.

The ASA: Formed from the vertebral artery. It is larger than the posterior spinal arteries and runs the whole length of the spinal cord. It becomes very small in places like the thoracic cord that it appears absent. It supplies the whole cord anterior to the posterior grey columns and the anterior grey and white columns of both sides

The PSA: Formed from the posterior inferior cerebellar or vertebral artery. There is connection between the two arteries and some scanty connections with the ASA. The PSA supplies the grey and white posterior columns of its own side.

By themselves the ASA and the 2 PSAs can supply only the short superior part of the spinal cord. The circulation to most of the spinal cord depends on segmental medullary and radicular arteries running along the spinal roots. The anterior and posterior segmental medullary arteries are derived from spinal branches of the ascending cervical, deep cervical, vertebral, posterior intercostal and lumbar arteries.

**Question 39**

The following is true about the submandibualr gland EXCEPT?

A Parasympathetic secretomotor fibres is supplied by vagus

B The submental arteries supply the gland

C It is larger than the sublingual gland

D Lymphatic drainage is chiefly via the jugulo-omohyoid node

Explanation A

The submandibular glands lie along the body of the mandible, partly superior and inferior to the posterior part of the mandible, and partly superficial and partly deep to the mylohyoid muscle. The arterial supply is from the submental arteries. The veins accompany the arteries. The gland is supplied by presynaptic parasympathetic secretomotor fibres conveyed form the facial to the lingual nerve by the chorda tympani nerve, which synapse with postsynaptic neurons in the submandibular ganglion. Lymphatic drainage is via the deep cervical lymphnodes, particularly the jugulo-omohyoid node. The sublingual glands are the smallest salivary glands

**Question 40**

Regarding the nasal cavity. Which is INCORRECT?

A Lymphnode drainage of the nasal cavity is to the deep cervical, submandibular and retropharyngeal nodes

B 5 arteries supply the nasal cavity with blood

C Mucosa lines the entire nasal cavity

D Nerve supply of the nasal cavity is only V1 and V2 of the trigeminal nerve

Explanation C

The nasal cavity is entered anteriorly through the nares. It opens posteriorly into the nasopharynx through the choanae. Mucosa lines the nasal cavity except for the nasal vestibule, which is lined with skin. The nasal cavity is bound by a roof, floor, medial wall and a lateral wall

The nasal cavity is divided into 5 passages

Nerve innervation: Trigeminal nerve branches V1(ophthalmic) and V2 (maxillary). The olfactory nerve-concerned with smell, arise form cells in the olfactory epithelium in the superior part of the lateral and septal wall of the nasal cavity. The nerve does not innervate the nasal cavity.

Vascular supply: Anterior ethmoidal artery (from the ophthalmic artery), posterior ethmoidal artery (from the ophthalmic artery), sphenopalatine artery (from the maxillary artery), greater palatine artery (from the maxillary artery), septal branch of the superior labial artery (from the facial artery)

Lymph drainage: submandibular, retropharyngeal and deep cervical nodes

**Question 41**

Kiesselbach area is supplied by all of the following arteries EXCEPT?

A Anterior ethmoidal artery

B Greater palatine artery

C Septal branch of the inferior labial artery

D Sphenopalatine artery

Explanation C

The anterior part of the nasal septum is called Kiesselbach's area. It is an anastomosing arterial complex involving all 5 arteries supplying the septum. They include

Anterior ethmoidal artery from the opthalmic artery

Posterior ethmoidal artery from the opthalmic artery

Sphenopalatine artery from the maxillary artery

Greater palatine artery from the maxillary artery

Septal branch of the superior labial artery from the facial artery

**Question 42**

Which autonomic cranial ganglion distribution paring is INCORRECT?

A Submandibular: sublingual

B Otic ganglion: eye muscles

C Ciliary ganglion: iris

D Pterygopalatine ganglion: lacrimal gland

Explanation B

Ciliary ganglion: parasympathetic (PS)-iris, sympathetic (S)-dilator of pupil and blood vessels of the eye

Pterygopalatine ganglion: PS-lacrimal gland, S-vessels of nasal cavity, palate, and superior parts of pharynx

Otic ganglion: PS- parotid gland, S-parotid gland blood vessels

Submandibular: PS-sublingual and submandibular glands, S-sublingual and submandibular glands

**Question 43**

Which ciliary ganglion-cranial nerve pairing is CORRECT?

A Pterygopalatine ganglion: CN VII

B Otic ganglion: CN X

C Ciliary ganglion: CN II

D Submandibular ganglion: CN IX

Explanation A

Ciliary ganglion: Parasympathetic root (PR)= CN III, sympathetic root (SR)= internal carotid plexus

Pterygopalatine ganglion: PR= CN VII, SR= internal carotid plexus and CNV2

Otic ganglion: PR= CN IX, SR= superior cervical ganglion

Submandibular ganglion: PR= CN VII, SR= superior cervical ganglion

Note: for cranial nerve contributions to the ganglion of the head and neck: COPS 3977 (i.e. ciliary CN III, otic CN IX, pterygopalatine CN VII, and submandibular CN VII)

**Question 44**

If a herniation of a cervical disc occurs at the C5-C6 level, in what region would the pain most likely be refered?

A Fingers

B Thumb

C Shoulder

D Lateral arm

Explanation B

The cervical spine nerves exit superior to the vertebra of the same number, so the numerical relationship of herniating disc to nerve affected is the same as the lower verterbra. If a disc is ruptured at C5-C6 level, the C6 spinal nerve will be compressed. If there is a C6-C7, the C7 spinal nerve will be compressed. The same does not hold below the cervical spine as the nerves exit inferior to the vertebrae. C6- covers the lateral forearm (below elbow) and the thumb.

**Question 45**

Which of the following arteries are NOT DIRECTLY involved in causing an anterior nose bleed?

A Septal branch of the superior labial artery

B Sphenopalatine artery

C Anterior ethmoidal artery

D Maxillary artery

Explanation D

The anterior part of the nasal septum is the site (Kiesselbach area) of an anastomotic arterial plexus involving 5 arteries

* Anterior ethmoidal artery (from the ophthalmic artery)
* Posterior ethmoidal artery (from the ophthalmic artery)
* Sphenopalatine artery (from the maxillary artery)
* Greater palatine artery (from the maxillary artery)
* Septal branch of the superior labial artery (from the facial artery)

**Question 46**

Which of the following nerves is not a cutaneous branch of the ophthalmic division of the trigeminal nerve CNV supplying the face and scull

A Zygomaticotemporal

B External nasal

C Supratrochlear

D Lacrimal

Explanation A

CNV- Ophthalmic division-cutaneous branches:

* Supraorbital
* Supratrochlear
* Lacrimal
* Infratrochlear
* External nasal

CNV- Maxillary division-cutaneous branches:

* Zygomaticotemporal
* Infra-orbital
* Zygomaticofacial

CNV- Mandibular division-cutaneous branches:

* Auriculotemporal
* Mental
* Buccal

**Question 47**

Which of the following eye muscles depresses, adducts and laterally rotates the eyeball?

A Inferior rectus

B Superior rectus

C Superior oblique

D Inferior oblique

Explanation A

Superior oblique: Abducts, depresses and medially rotates the eyeball

Inferior oblique: Abducts, elevates and laterally rotates the eyeball

Superior rectus: Elevates, adducts and medially rotates the eyeball

Inferior rectus: Depresses, adducts and laterally rotates the eyeball

**Question 48**

Which of the following branches of the external carotid artery do not arise in the carotid triangle?

A Posterior auricular artery

B Ascending pharyngeal artery

C Occipital artery

D Lingual artery

Explanation A

Arising in the carotid triangle:

* Superior thyroid artery
* Ascending pharyngeal artery
* Lingual artery
* Facial artery
* Occipital artery

Separate to the carotid sheath

* Posterior auricular artery does not arise in the carotid triangle

Terminal branches:

* Maxillary artery
* Superficial temporal artery

**Question 49**

The anterior triangle of the neck is divided into 4 smaller triangles. Which of the following smaller triangles is INCORRECT?

A Hyoglossus triangle

B Muscular triangle

C Carotid triangle

D Digastric triangle

Explanation A

The anterior triangle (anterior cervical region) boundaries:

* Sternocleidomastoid,
* Mandible
* Midline

The triangle is subdivided into 4 smaller triangles

* Carotid
* Digastric (aka submandibular)
* Submental
* Muscular

Below are the contents of the first three triangles:

Muscles: Suprahyoid muscles (Mylohyoid, genihyoid, stylohyoid, digastric), Infrahyoid muscles (Sternohyoid, sternothyroid, thyrohyoid, omohyoid)

Arteries: Carotid system of arteries (CC, IC, EC), Submandibualr branches, Submental vessels, Mylohyoid vessels, External carotid branches (Ascending pharyngeal, Occipital, Posterior auricular (not included), Superior thyroid, Lingual, Facial)

Veins: Tributaries of the IJV

Nerves: Transverse cervical, Hypoglossal, Branches of the glossopharyngeal, Branches of the vagus nerve, Laryngeal nerve, Mylohoid nerve, Ansa cervacalis

Lymph nodes: Jugulo digastric

Glands: Submandibular

Muscular triangle contents: parts of larynx, trachea, pharynx, oesophagus, thyroid and parathyroid glands-their vessels, nerves and glands