1. Upper limb weight is transmitted to axial skeleton by all except?

a) Coracoacromial ligament

b) Claviculoclavicular [interclavicularj ligament

c) Costoclavicular ligament

d) Acromioclavicular ligament

Correct Answer - A

Ans. A.Coracoacromial ligament

Coracoacromial ligament

The weight of the upper limb is transmitted from the scapula to the clavicle through the acromioclavicular joint and from the clavicle to the axial skeleton through the sternoclavicular joint.

Thus the ligaments maintaining the stability of these two joints transmit the weight of the upper limb to the axial skeleton.

Acromioclavicular joint

- Acromioclavicular joint is formed by articulation between the lateral end of the clavicle and the medial margin of the acromial process of the scapula.

Ligaments stabilizing the joint are:

- Acromioclavicular ligament
- Coracoclavicular ligament (this is the major ligament transmitting upper limb weight to the clavicle)

Sternoclavicular joint

- Sternoclavicular joint is the only skeletal articulation between the upper limb and the axial skeleton.

It is a compound joint with 3 elements taking part in the joint:

1. medial end of the clavicle
2. the clavicular notch of the manubrium sterni and

3. first costal cartilage

The ligaments of the joint are:

- the anterior and posterior sternoclavicular ligaments,
- the costoclavicular ligaments on each side,
- and the midline interclavicular ligament.

- The interclavicular ligament passes between the sternal ends of the right and left clavicles, with some of the fibres attached to the upper border of the manubrium sterni.
- Costoclavicular ligament connects the clavicle to the upper surface of the first rib and its cartilage. This ligament is very strong and is the major stabilizing factor of the sternoclavicular joint.
- The Coracoacromial Ligament is a strong ligament, extending between the coracoid process and the acromion. This ligament, together with the coracoid process and the acromion, forms the coracoacromial arch which prevents upward dislocation of the humerus. It extends between two processes of the scapula and takes no part in transmission of weight of the upper limb to the axial skeleton.

2. All of the following muscles retract the scapula except

a) >Trapezius

b) >Rhomboid major

c) >Rhomboid minor

d) >Levator scapulae

Correct Answer - D
Levator scapulae
Movements of the Scapula

- Elevation - moving the superior border of the scapula and the acromion in an upward direction.
- Depression - moving the superior border of the scapula and the acromion in a downward direction.
- Upward Rotation - Moving the scapula so that the glenoid cavity faces upward.(Increases the range of motion during abduction and/or flexion of the shoulder).
- Downward Rotation - moving the scapula so that the glenoid cavity faces inferiorly.(Increases range of motion during extension and / or adduction of the shoulder).
- Protraction (Abduction) - moving the scapula away from the midline
- Retraction (Adduction) - moving the scapula towards the midline

Retraction of the scapula is sometimes called adduction of the scapula. The scapula is moved posteriorly and medially along the chest wall.

Muscles: rhomboideus major, minor, and trapezius are the prime movers.

3. Boundary of triangle of auscultation is not formed by:

a) >Serratus anterior

b) >Scapula

c) >Trapezius

d) >Latissimus dorsi

Correct Answer - A
Serratus anterior *[Ref: B.D.C. Anatomy 4/e vol. 1 p64]Repeat from Nov 08*
The triangle of auscultation is a small triangular space on the back where the relatively thin musculature allows for respiratory sounds to be heard more clearly with a stethoscope.
It has the following boundaries:

- medially, by the Trapezius
- laterally by the scapula
- inferiorly by the Latissimus dorsi

The floor is formed by

- 7^{th} rib
- 6^{th} & 7^{th} intercostal spaces
- Rhomboideus major

On the left side, the cardiac orifice of the stomach lies deep to the triangle, and in days before X-rays were discovered the sounds of swallowed liquids were auscultated over this triangle.

4. All of the following organs develop in the mesentery of stomach except :

a) Liver

b) Spleen

c) Kidney

d) Pancreas

Correct Answer - C

Ans. C. Kidney

Kidneys are retroperitoneal organs from the very beginning and do not develop within the mesentery of the stomach. Pancreas is a secondarily retroperitoneal organ. It originally develops within the mesentery and is covered by mesentery, but later fuses with the posterior body wall to become a retroperitoneal organ.

Kidneys:

- Kidneys develop from two sources
- Metanephros – give rise to excretory tubules. [Metanephros is the lowest part of nephrogenic cord which is derived from intermediate mesoderon]
- Ureteric bud – diverticulum arising from lower part of mesonephric duet gives rise to the collecting part of the kidney & ureter.
- Kidneys do not develop in mesentery of the stomach. They are retroperioneal from the beginning

5. At which joint does inversion of foot occur:

a) Talocrural

b) Talocalcaneal

c) Calcaneocuboid

d) Cuneonavicular

Correct Answer - B

Ans: B. Talocalcaneal

- Inversion: Medial border of the foot is raised so that sole faces inside.
- Eversion: Lateral border of the foot is raised so that the sole faces outside.
- Inversion and eversion occur mainly at intertarsal joint.
- Major movements occur at Talo-calcaneo-navicular joint.
- Other involved joints are Transverse Tarsal/Midtarsal joints

Movements at the Intertarsal Joint (Talocalcaneal, Transverse Tarsal Joint)

Movement	**Muscle involved**
Inversion	Tibialis anterior, tibialis posterior, extensor hallucis longus and triceps surae
Eversion	Extensor digitorum longus, peroneus longus, brevis, and tertius

6. **All of the following are branches of the external carotid artery except?**

a) Superior thyroid artery

b) Anterior Ethmoidal artery

c) Occipital artery

d) Posterior auricular artery

Correct Answer - B

Anterior ethmoidal artery is a branch of the ophthalmic artery which is a branch of the internal carotid artery.

7. **All statements regarding trochlear nerve are true, EXCEPT?**

a) Longest intracranial course

b) Arises from dorsum of brainstem

c) Supply ipsilateral superior oblique muscle

d) Enters orbit through superior orbital fissure outside annulus of Zinn

Correct Answer - C

Trochlear nerve is a crossed cranial nerve. The nucleus of the trochlear nerve supplies the contralateral superior oblique muscle.The trochlear nerve emerges from dorsal surface of the brainstem near the midline, courses anteriorly around the cerebral peduncle and enters the orbit through superior orbital fissure.

The trochlear nerve has certain unique features:

- It is the only cranial nerve whose fibers originate totally from the contralateral nucleus.
- It is the only cranial nerve to emerge from the dorsal surface of the brain stem.
- It is the most slender of all the cranial nerves.
- It has the longest intradural course among the three extraocular motor nerves.
- It supplies only one muscle i.e. superior oblique (Abducent cranial nerve also supplies only one muscle i.e. Lateral rectus).

8. **Common carotid artery divides at the level of?**

a) Hyoid bone

b) Cricoid cartilage

c) Superior border of thyroid cartilage

d) Inferior border of thyroid cartilage

Correct Answer - C

The common carotid artery divides into internal and external branches at the level of the fourth cervical vertebra which also corresponds to the upper border of the thyroid cartilage.

Branches of External carotid artery are:

- Superior thyroid artery
- Lingual artery
- Facial artery
- Ascending pharyngeal artery
- Occipital artery
- Posterior auricular artery
- Maxillary artery
- Superficial temporal artery

Branches of Internal carotid artery:

- Cervical portion has no branches

Branches from other portions are:

- Tympanic branch
- Artery of the pterygoid canal
- Cavernous branches
- Hypophyseal branches
- Anterior meningeal branch
- Ophthalmic artery
- Anterior cerebral artery

- Middle cerebral artery
- Posterior communicating artery
- Anterior choroidal artery

9. **In a subclavian artery block at outer border of 1st rib, all of the following arteries help in maintaining the circulation to upper limb, EXCEPT?**

a) Subscapular artery

b) Superior thoracic artery

c) Thyrocervical trunk

d) Suprascapular artery

Correct Answer - B

Ans. B. Superior thoracic artery

A rich anastomosis exists around the scapula between branches of subclavian artery (first part) and the axillary artery (third part). This anastomosis provides a collateral circulation through which blood can flow to the limb when the distal part of subclavian artery or the proximal part of axillary artery is blocked.

Scapular anastomoses occur between the following branches of proximal subclavian and distal axillary artery:

- Branches of Subclavian artery: Thyrocervical trunk, Suprascapular and Deep branch of transverse cervical.
- Branches of Axillary artery: Subscapular, Posterior circumflex humeral and Thoracoacromial arteires.

10. **Carpel tunnel syndrome is caused by all, EXCEPT?**

a) Amylodosis

b) Hypothyroidism

c) Addisson's disease

d) Diabetes mellitus

Correct Answer - C

Carpal tunnel syndrome (tardy median palsy) is the result of compression of the median nerve within the carpal tunnel. *Conditions leading to CTS are* pregnancy, history of repetitive use of hands, following an injury of the wrist, diabetes mellitus, rheumatoid arthritis, inflammatory tenosynovitis, myxedema, localized amyloidosis in localized kidney disease, sarcoidosis, leukemia, acromegaly, and hyperparathyroidism.

The patient usually presents with pain, burning, and tingling in the distribution of the median nerve. *On examination,* weakness or atrophy, especially of the thenar eminence is noted. Tinel sign and Phalen sign are positive. *Tinel sign* is tingling or shock-like pain elicited by tapping the volar surface of the wrist; *Phalen sign* is pain or paresthesia in the distribution of the median nerve when the patient flexes both wrists to 90 degrees for 60 seconds.

11. **The axillary sheath is an extension of this fascia around the subclavian artery and brachial plexus. Fascia around nerve bundle of brachial plexus is derived from?**

a) Prevertebral fascia

b) Pretracheal fascia

c) Investing layer

d) Superficial cervical fascia

Correct Answer - A

The brachial plexus and the subclavian artery course between the anterior and middle scalene muscles, and as the nerve plexus and artery emerge from those muscles, they carry an extension of the prevertebral fascia along to form the axillary sheath.

12. **A patient presented with numbness of little and ring finger, atrophy of hypothenar muscles. The nerve damaged will be?**

a) Palmar cutaneous branch of ulnar

b) Deep branch of ulnar

c) Ulnar nerve before division into superficial and deep branches

d) Posterior cord of brachial plexus

Correct Answer - C

This is a case of cubital tunnel syndrome**,** which is caused by compression or irritation of the ulnar nerve as it passes under the medial epicondyle before it branches to deep and superficial branches. Symptoms are usually tingling and numbness in the cutaneous distribution of the ulnar nerve. In severe cases, muscle weakness may be apparent, with atrophy of the hypothenar eminence.

Also know:

Deep branch of ulnar nerve supplies:

- Hypothenar compartment
- Adductor pollicis
- Dorsal interossei
- Palmar interossei
- Medial lumbricals

Superficial branch of ulnar nerve supplies:

- Palmaris brevis
- Surrounding skin of the digit 5 and the medial side of digit 4

13. **A female presented with loss of extension of little and ring finger, hypothenar atrophy and metacarpophalangeal joint hyperextension. The nerve injured is?**

a) Post interosseous nerve

b) Radial trunk

c) Ulnar Nerve

d) Median nerve

Correct Answer - C
When the ulnar nerve is injured in the hand, there is a loss of the interossei and lumbricals 3 and 4, and clawing of digits 4 and 5 may become apparent due to an imbalance of the extrinsic and intrinsic muscles. Because the extrinsic extensors of the hand are not opposed by the intrinsic flexors of the hand, the metacarpophalangeal joint hyperextends and is unable to extend the proximal and distal interphalangeal joints.
The proximal and distal interphalangeal joints continue to flex because the extrinsic flexors are not opposed by the intrinsic extensors of the distal and proximal interphalangeal joints. The result is extension of the metacarpophalangeal joint and flexion of the proximal and distal interphalangeal joints. Hypothenar atrophy also seen.

14. **A person receives a laceration along the anterior border of the trapezius muscle in the neck and subsequently the point of his shoulder (scapula) sags and he has some difficulty fully abducting his arm. What nerve appears to have been severed?**

a) Accessory (Cr. N. XI)

b) Axillary

c) Dorsal scapular

d) Greater occipital

Correct Answer - A

If the *accessory nerve* is damaged and the trapezius is denervated, a person will no longer be able to raise the acromion of the shoulder. The *dorsal scapular nerve* innervates rhomboid major, rhomboid minor, and levator scapulae. If the dorsal scapular nerve is damaged, the rhomboids will be denervated, and retraction of the scapula will be weakened. An injury to the greater occipital nerve will result in a loss of sensation on the posterior scalp but no muscular deficit.

The axillary nerve and suprascapular nerve will be covered with the upper limb, but for completeness, note that the axillary nerve innervates the deltoid muscle. If this nerve is damaged, the deltoid may atrophy, and the person will be unable to abduct the arm.

15. **What is the root value of long thoracic nerve?**

a) C3 4 5

b) C5 6 7

c) C7 8 T1

d) C2 3 4

Correct Answer - B
Long thoracic nerve (C5–C7): It branches off the C5–C7 roots, descends posteriorly to the roots of the plexus and the axillary artery and along the lateral surface of the serratus anterior muscle, with the lateral thoracic artery, while supplying the muscle. The long thoracic nerve is one of the few nerves found superficial to the serratus anterior muscle.

Phrenic nerve (C3–C5): Courses vertically along the anterior scalene muscle between the subclavian artery and the subclavian vein en route to innervate the diaphragm. ("C3–C5, keep the diaphragm alive" is a mnemonic that is used to remember the spinal nerve levels of the phrenic nerve.)

Transverse cervical nerve (C2–C3): Innervates the skin over the anterior part of the neck.

Supraclavicular nerve (C3–C4): Innervates the skin over the lower portion of the neck, upper part of the chest, and the shoulder.

Also Know:

- Erb's palsy (brachial plexus birth injury) is caused by a stretch injury of the brachial plexus that occurs during a difficult birth, specifically

to nerve roots C5 and C6 and sometimes C7.

- Klumpke's palsy results from injury to the inferior trunk of the brachial plexus. The intrinsic muscles of the hand are affected and a "claw hand" may result.

16. **While putting nasogastric tube, the length is measured from upper incisors. What is the distance from upper incisors to cardia of the stomach?**

a) 15 cm

b) 25 cm

c) 40 cm

d) 60 cm

Correct Answer - C

The esophagus is about *25 cm (10 in.)* long. The distance from the upper incisor teeth to the beginning of the esophagus (cricoid cartilage) is about *15 cm (6 in.)*; from the upper incisors to the level of the bronchi, *22 to 23 cm (9 in.)*; and to the cardia, *40 cm (16 in.).*

The commonly used method to measure nasogastric tube length is the NEX method. NEX: Nose–Ear–Xiphisternum.

"To measure the required length of tube, measure from ***the tip of the patient's*** *nose, to their ear, and then down to the xiphisternum."*

17. **Which of the following structure is crossed by root of mesentery?**

a) Horizontal part of duodenum

b) Left gonadal vessels

c) Left ureter

d) Superior mesenteric artery

Correct Answer - A

"The root of the mesentery crosses (successively) the third part of duodenum, abdominal aorta, IVC, right ureter, right psoas major, right genitofemoral nerve and right gonadal vessels.

Mesentery is a peritoneal fold that suspend jejunum and ileum from the posterior abdominal wall. It has two layers and two borders. The posterior border is called root of mesentery. Root of mesentery is 15cm long and its line of attachment runs obliquely down ward and to the right from duodenojejunal flexure to the right iliac fossa.

18. **Which of the following statement is TRUE about testis?**

a) Ectodermal origin

b) Gubernaculum is attached to caudal end

c) Surrounded by peritoneal tunica albuginea

d) By 28th week it reach at scrotum

Correct Answer - B

Gubernaculum is either a pair of folds of peritoneum that attach to the caudal end of the gonads (testes in males and ovaries in females). Toward the end of fetal development, the testis begins its descent from the abdomen to the scrotum. The peritoneum covering the testis becomes the **processus vaginalis**, and the gubernaculum leads the testis into its scrotal position.

The development of the urinary system and genital systems are closely linked. The urogenital system develops from intermediate mesoderm. A longitudinal elevation - **the urogenital ridge** - forms on each side of the dorsal aorta, with the nephrogenic cord leading to the urinary system and the gonadal ridge leading to the genital system.

19. **Which nerve does NOT supply gluteal region of the body?**

a) Sciatic nerve

b) Superior gluteal nerve

c) Inferior gluteal nerve

d) Nerve to obturator internus

Correct Answer - A

The **sciatic nerve** supplies motor innervation to the hamstring muscles and all the muscles below the knee through its two divisions, the tibial and peroneal nerves. *It does not supply the gluteal region.*

The sciatic nerve enters the gluteal region through greater sciatic foramen below piriformis, runs downward between the greater trochanter and ischial tuberosity, and enters the back of thigh at the lower border of gluteus maximus. It does not give branches in the gluteal region

Must know:

- **Superior gluteal nerve (L4–S1):** Provides motor innervation to the gluteus medius, gluteus minimus, and tensor fascia lata muscles.
- **Inferior gluteal nerve (L5–S2):** Provides motor innervation to the gluteus maximus muscle.
- The obturator internus muscle laterally rotates the femur at the hip joint. The nerve to the obturator internus and superior gemellus muscles (L5, S1, S2) innervates this muscle.

20. The sphincter of Oddi regulates flow of bile (and pancreatic juice) into the duodenum. It consists of:

a) 2 sphincters

b) 3 sphincters

c) 4 sphincters

d) 5 sphincters

Correct Answer - B

The human **sphincter of Oddi** is about 10–15 mm in length, situated within the muscular layer of the media of the duodenum. It consists of three distinct segments:

- Sphincter choledochus,
- Sphincter pancreaticus, and
- Ampullary sphincter

The choledochal sphincter covers the distal end of the intraduodenal part of the common bile duct before it joins with the pancreatic duct **(duct of Wirsung).** The pancreatic sphincter is located at the distal end of the pancreatic duct. The ampullary sphincter covers the distal end of both ducts. The term “sphincter of Oddi” refers to all three sphincters.

21. **Which of the following structure in spermatic cord doesn't come during surgery for vasectomy?**

a) Testicular artery

b) Ilioinguinal nerve

c) Autonomic nerves

d) Testicular vein

Correct Answer - B

The ilioinguinal nerve (L1) passes through part of the inguinal canal but not a part of spermatic cord.

The spermatic cord contains the following structures:

- Ductus deferens
- Testicular (gonadal) artery
- Testicular (gonadal) vein
- Autonomic neurons
- Pampiniform plexus of veins
- Remains of processus vaginalis

22. **Which of the following nerve serve as the efferent limb for cremasteric reflex?**

a) Hypogastric nerve

b) Genito femoral nerve

c) Ilioinguinal nerve

d) All of the above

Correct Answer - B
Ilioinguinal nerve serve as the afferent limb and genitofemoral nerve serve as the efferent limb of cremasteric reflex.

Cremasteric reflex is elicited by gently stroking the skin on the upper inner side of the thigh from above downwards. A positive response refers to contraction of the cremasteric muscle and elevation of the testicle on that side. An upper motor neuron injury can cause diminished or loss of the reflex.

The root value of cremasteric reflex is Ll-L2. The afferent fibers of cremasteric reflex arc travel in the femoral branch of the Ilioinguinal nerve (L1 and 2), and the efferent motor nerve fibers travel in the genital branch of the genitofemoral nerve.

"Cremaster is innervated by the genital branch of the genitofemoral nerve, derived from the first and second lumbar spinal nerves.

23. **What is the rostral end of the corpus callosum called?**

a) Genu

b) Splenium

c) Body

d) Anterior Horn

Correct Answer - B

The corpus callosum is a large bundle of myelinated and non-myelinated fibers, the great white commissure that crosses the longitudinal cerebral fissure and interconnects the hemispheres. *The body of the corpus callosum is arched; its anterior curved portion, the genu, continues antero ventrally as the rostrum.* The thick posterior portion terminates in the curved splenium, which lies over the midbrain.

Also Know:

The corpus callosum is the largest of the interhemispheric commissures and is largely responsible for co-ordinating the activities of the two cerebral hemispheres.

24. **Spleen projects into which of the following space of peritoneal cavity?**

a) Paracolic gutter

b) Infracolic compartment

c) Left subhepatic space

d) Greater Sac

Correct Answer - D

"Being developed in the dorsal mesogastrium, the spleen projects into the greater sac surrounded by peritoneum of the original leaf of the dorsal mesogastrium."-
Ref: Last's Anatomy.

Spleen starts to develop in the 4 the week of gestation as a mesenchymal condensation in the dorsal mesogastrium of the lesser sac. In the following weeks these early mesenchymal cells differentiate to a vascular lymphatic pedicle that eventually forms the spleen.

When the embryo is 10cm long dorsal mesogastrium can be divided into anterior and posterior part. Posterior part forms the splenorenal ligament. It contains splenic artery and vein. Anterior part of dorsal mesogastrium develops into gastrosplenic ligament and contains short gastric vessels.

25. All of the following are present in Superficial perineal pouch except:

a) Sphincter urethrae muscles

b) Bulbospongiosus

c) Posterior scrotal nerves

d) Duct of Bulbourethral glands

Correct Answer - A
A i.e. Sphincter urethral muscles
Root, crura & bulb of penis (i.e. 1 bulb/corpus spongiosa & 2 crura/corpora cavernosa), bulbospongiosus muscle, ducts of bulburethral gland, and posterior scrotal nerve/artery4 are contents of superficial perineal pouch.
Deep perineal pouch contains *bulbourethral glands, membranous urethra, sphincter urethrae muscle (internal urethral sphincter) and dorsal nerve of peris*

26. Sternocleidomastoid is supplied by all of the following arteries except?

a) Occipital

b) Posterior auricular

c) Thyrocervical trunk

d) Superior thyroid

Correct Answer - C
C i.e. Thyrocervical trunk
Sternocleidomastoid muscle receives its blood supply from branches of *occipital & posterior auricular arteriesQ* (upper part of muscle), the *superior thyroid artery* or branches of external carotid artery (middle part of muscle) and the *suprascapular artery* (lower part of muscle)
Although suprascapular artery is a branch of thyrocervical trunk, it seems to be the most appropriate answer as all other options directly supply the muscle.

27. The first centres of ossification appears during which month of pregnancy

a) At the end of 2nd month of pregnancy

b) At the beginning of 3rd month of pregnancy

c) At the end of 3rd month of pregnancy

d) At the end of 4th month of pregnancy

Correct Answer - A

A i.e. At the end of 2^{nd} month of pregnancy

Clavicle is the *first bone in the body to start ossifying* and is ossified from 3 centres. The shaft of clavicle is ossified from 2 (medical & lateral) primary centres, *which appear between the* 5^{th} *& 6", weeks of intra uterine life,* and fuse about the 45th day meeting between the middle and lateral third of clavicle. A *secondary centre for sternal end* (and sometimes for *acromial end)* appears in late teens or early twenties

28. Which structure lies immediately lateral to femoral hernia?

a) Lateral cutaneous nerve of thigh

b) Femoral nerve

c) Femoral artery

d) Femoral vein

Correct Answer - D
D i.e. Femoral vein
- *The femoral ring refers to the upper opening of the most medial compartment of the femoral sheath (femoral canal) containing lymph nodes of Cloquet or Rossenmuller & lymphaticsQ. The femoral artery occupies the lateral compartment and is separated from the femoral ring by an intermediate compartment, occupied by the femoral vein.*

Femoral ring, an upper opening *in femoral canal* (ie medial most compartment of femoral sheath) is a potentially weak point in lower abdomen and is the site for femoral hernia. So the *intermediate compartment containing femoral vein lies lateral to the sac of femoral hernia.*

29. Vertical crest in fundus of the internal auditary canal is k/a:

a) Bill's bar

b) Ponticul us

c) Cog

d) Falciform crest

Correct Answer - A
A ie Bill's Bar
Vertical crest in fundus of internal auditory canal is K/a Bill's -bar(2.
And it is used as a surgical landmark for facial nerve identification.

30. Structure not passing through the esophageal hiatus:

a) Left phrenic nerve

b) Right vagus nerve

c) Left vagus nerve

d) Left gastric artery

Correct Answer - A
Aortic opening lies in osteoaponeurotic part of diaphragm *between right & left crusQ* at $T_{12}^{1}2$ vertebral level and it transmits - *aorta, azygous vein & thoracic ductQ.*
Oesophageal opening lies in *muscular portion derived from right crus at TIO levelQ* and it *transmits oesophagusQ, oesophageal branch of left gastric arteryQ and both right & left vagus (gastric) nervesQ*
Right phrenic nerve passes through the *central tendon of diaphragm at T8 levelQ,* either through *venacaval aperture (with IVC)Q* or just lateral to it. Whereas, left phrenic nerve passes through the muscular part of diaphragm anterior to central tendon, just lateral to left cardiac surface and more anterior than the right phrenic nerve.

31. Which is not a feature of occulomotor nerve palsy?

a) Miosis

b) Difficulty in accommodation

c) Superior gaze palsy

d) Diplopia

Correct Answer - A
A i.e., Miosis

32. Structure passing through the central tendon of diaphragm is:

a) Esophagus

b) Right Phrenic nerve

c) Subcostal nerve

d) Left phrenic nerve

Correct Answer - B

Venacaval opening lies in the central tendon of the diaphragm at the level of T8 and it transmits inferior vena cava and branches of right phrenic nerve

Diaphragm

- T8 Level: Caval hiatus (through central tendon of the diaphragm) transmitting the inferior vena cava, branches of right phrenic nerve
- **T9 Level:** Foramen of Morgagni also called stemocostal hiatus two on each side of the xiphoid process. Transmitting the superior epigastric vessels.
- **T10** Level: Esophageal hiatus (through muscular part) transmitting the esophagus, gastric (vagus) nerve and esophageal branches of the left gastric artery and accompanying veins
- **T12 Level:** Aortic hiatus (osseoaponeurotic) transmitting the aorta, the azygous vein, and the thoracic duct.
- A commonly used mnemonic to remember the level of the diaphragmatic apertures is this: Mnemonic
- Aortic hiatus = 12 letters = T12
- Oesophagus = 10 letters = T10
- Vena cava = 8 letters = T8

Embryology:

- The central tendinous portions are derived from the pleuroperitoneal

folds and the septum transversum.

- While the crura are derived from the dorsal esophageal mesentery, the peripheral muscular portions of the diaphragm are derived from the body wall.

33. Elevation of jaw is done by all except:

a) Temporalis

b) Masseter

c) Lateral pterygoids

d) Medial pterygoids

Correct Answer - C

Depression of the Mandible

* Depression of the mandible is brought about by contraction of the digastrics, the geniohyoids, and the mylohyoids; the lateral pterygoids play an important role by pulling the mandible forward.

Elevation of the Mandible

* Elevation of the mandible is brought about by contraction of the temporalis, the masseter, and the medial pterygoids. The head of the mandible is pulled backward by the posterior fibers of the temporalis.

Protrusion of the Mandible

* In protrusion, the lower teeth are drawn forward over the upper teeth, which is brought about by contraction of the lateral pterygoid muscles of both sides, assisted by both medial pterygoids.

Refraction of the Mandible

* The articular disc and the head of the mandible are pulled back into the mandibular fossa. Retraction is brought about by contraction of the posterior fibers of the temporalis.

Lateral Chewing Movements

* These are accomplished by alternately protruding and retracting the mandible on each side. For this to take place, a certain amount of rotation occurs, and the muscles responsible on both sides work alternately like turning the chin to the left side produced by left lateral pterygoid and right medial pterygoid and vice versa

pterygoid and right medial pterygoid and vice versa.

34.

Which of the following is not the part of ethmoid bone?

a) Agger nasi

b) Crista galli

c) Uncinate process

d) Inferior turbinate

Correct Answer - D
Ans. d. Inferior turbinate
Inferior turbinate is not the part of ethmoid bone.
`Lateral nasal wall has 3 bony projections called as turbinates or conchae. From below upwards, they are inferior, middle and superior turbinates. The inferior turbinate is a separate bone, while rest of the turbinates are part of ethmoidal labyrinths.'
The agger nasi air cells, are the most anterior ethmoidal air cells, lying anterolateral and inferior to the frontoethmoidal recess and anterior and above the attachment of the middle turbinate. They are located within the lacrimal bone and therefore have as lateral relations the orbit, the lacrimal sac and the nasolacrimal duct.'
The crista galli is a median ridge of bone that projects from the cribriform plate of the ethmoid bone. It is where the falx cerebri attaches anteriorly to the skull. The olfactory bulbs lie on either side of the crista galli on top of the cribriform plate.'
In the ethmoid bone, a curved lamina, the uncinate process, projects downward and backward from this part of the labyrinth; it forms a small part of the medial wall of the maxillary sinus, and articulates with the ethmoidal process of the inferior nasal concha.'

35.

Which part of the fallopian tube acts as a functional/ anatomical sphincter?

a) Isthmus

b) Intramural

c) Ampulla

d) Infundibulum

Correct Answer - A
Ans. a. Isthmus
Isthmus of the fallopian tube acts as a functional/anatomical sphincter.
The uterine end of the tube, called the isthmus, acts like sphincter, and prevents the embryo from being released into the uterus for 2 days, so that it enters the uterus at the just right time for the implantation.'- How To Have A Baby: Overcoming Infertility By Aniruddha N Malpani/105
'The lumen of the narrow isthmus is relatively simple, with a few longitudinal folds. This portion of its tube is 2 or 3 *cm* long. There are three layers of musculature: the inner longitudinal, the middle circular layer, and the outer longitudinal layer. There is some evidence that the isthmus may act as a sphincter.'- *Clinical Anatomy of the Uterus, Fallopian Tubes, and Ovaries by Eric R Sokol*

36. 'Dynamic stabilizer of shoulder joint' term is used for:

a) Rotator cuff

b) Glenoid labrum

c) Coracohumeral ligament

d) Glenohumeral ligament

Correct Answer - A

Ans. a. Rotator cuff

`Dynamic stabilizer of shoulder joint' term is used for rotator cuff or musculotendinous cuff

The rotator cuff is the name given to the tendons of the subscapularis, supraspinatus, infraspinatus, and teres minor muscles, which are fused to the underlying capsule of the shoulder joint. The cuff plays a very important role in stabilizing the shoulder join[Q]. The tone of these muscles assists in holding the head of the humerus in the glenoid cavity of the scapula during movements at the shoulder joint. The cuff lies on the anterior, superior, and posterior aspects of the joint. The cuff is deficient inferiorly, and this is a site of potential weakness.'- Snells 8/e

Musculotendinous Cuff of the Shoulder or Rotator Cuff

- Fibrous sheath formed *by* four flattened tendons, *which* blend with the capsule *of the shoulderjoint* and strengthen it. The *cuff plays a very important role in stabilizing the shoulder joint[Q].*
- The muscles which form the cuff arise from the scapula and are inserted into the lesser and greater tubercles of humerus.
- *Muscles of rotator cuff.*

.. Subscapularis[Q]

2. Supraspinatus[Q]
3. Infraspinatus[Q]
4. Teres minor[Q]

- Their tendons while crossing the shoulder joint become flattened and blend with each other on one hand, and with the capsule of joint on the other hand, before reaching their points of insertion.
- ***The cuff lies on the anterior, superior, and posterior aspects of the joint. The cuff is deficient inferiorly, and this is a site of potential weakness.***

37. Which of the following is not a derivative of neural ectoderm?

a) Sphincter pupillae

b) Retina

c) Dilator pupillae

d) Ciliary muscles

Correct Answer - D

Ans. d. Ciliary muscles

Ciliary muscles develop from Neural crest, not from neural crest.

Derivative of neural ectoderm:

- Ciliary body epithelium[Q]
- **Iris epithelium[Q]**
- **Smooth muscles of iris (constrictor[Q] and dilator pupillae[Q])**
- Part of vitreous
- Ret
- **Retinal pigment epithelium[Q]**
- **Retina[Q]** (its 9 sensory layers)
- Optic vesicle and cup
- **Optic nerve[Q]** (fibers)

38. Muscle, which is anatomically a back muscle, but functionally related to thorax is:

a) Rhomboid

b) Latisimus dorsi

c) Trapezius

d) Levator costae

Correct Answer - B

Ans. b. Lattisimus dorsi

Muscle, which is anatomically a back muscle, but functionally related to thorax is Latisimus dorsi.

The latissimus dorsi muscle is the widest muscle on the back though it mostly acts as a shoulder muscle.

39. Which of the followinu artery does not supply medulla?

a) Anterior spinal artery

b) Vertebral artery

c) Posterior inferior cerebellar artery

d) Superior cerebellar artery

Correct Answer - D

Ans. d. Superior cerebellar artery

Medulla is supplied by *anterior spinal artery, branches of vertebral artery and posterior inferior cerebellar artery (but not the Superior cerebellar artery).*

Blood supply of Medulla Oblongata

1. Anterior spinal artery[Q]

- The anterior spinal artery supplies the whole medial part of the medulla oblongata.
- A blockage (such as in a stroke) will injure the pyramidal tract, medial lemniscus, and the hypoglossal nucleus.
- This causes a syndrome called medial medullary syndrome.

2. Posterior inferior cerebellar artery (PICA)[Q]:

- The posterior inferior cerebellar artery, a major branch of the vertebral artery, supplies the posterolateral part of the medulla, where the main sensory tracts run and synapse.

3. Direct branches of the vertebral artery[Q];

- The vertebral artery supplies an area between the other two main arteries, including the nucleus solitarius and other sensory nuclei and fibers.
- Lateral medullary syndrome can be caused by occlusion of either

the PICA or the vertebral arteries.

40. External anal sphincter is innervated by:

a) S2, S3, S4

b) S2, S3

c) L5, S1

d) L2, L3

Correct Answer - A
Ans. a. S2, S3, S4
External anal sphinaer is innervated by inferior rectal branch of pudendal nerve (anterior divisions of S2,S3, S4 sacral spinal nerves) mainly and by perineal branch of S4.

41. Nerve root for dermatome supplying thumb and index finger:

a) C6 C8

b) C6 C7

c) C7 C8

d) C5 C6

Correct Answer - B

Ans. b. C6 C7

Nerve root	Dermatome
C5	Deltoid patch
C6	Lateral forearm
	Radial side of hand
	Thumb and index finger
C7	Posterior lateral arm and forearm
	Middle finger, Index finger
C8	Medial forearm
	Ulnar border of hand
	Ring and little finger
T1	Medial elbow and arm

42. A patient woke up with difficulty in extending fingers, can make a grip and hold a pen. Dorsiflexon was normal. Sensory and motor examination was normal. Nerve most commonly involved:

a) C8T1

b) Posterior interosseous nerve

c) Lower brachial plexus

d) Hand area in cortex

Correct Answer - B

Ans. b. Posterior interosseous nerve

A patient woke up with difficulty in extending fingers, can make a grip and hold a pen. Dorsiflexon was normal. Sensory and motor examination was *normal. Nerve most commonly involved is Posterior interosseous nerve.*

Posterior Interosseous Nerve Palsy:

- Nerve supplying extensors: Lesion can lead to difficulty in extending fingers
- Elbow, wrist, interphalangeal joint extension and sensations are spared (can make a grip and hold a pen. Dorsiflexon was normal. Sensory and motor examination was normal)
- Loss of metacarpophalyngeal joint extension

43. Regular vein, artery and nerve CVAN') arrangement is not present in which intercostal space (not the rib):

a) First intercostal space

b) Second intercostal space

c) Third intercostal space

d) Eleventh intercostal space

Correct Answer - A

Ans. a. First intercostal space

Regular vein, artery and nerve (`VAN') arrangement is not present in first intercostal space.

First Rib

- The first rib is supplied by the internal thoracic artery and superior intercostal artery. Venous drainage is via the intercostal vein.
- The rib is innervated by first intercostal nerve.

The first intercostal vessels and nerve pass along the lower surface between intercostal intimi and costal pleura with arrangements of nerve, artery and vein from above downwards.

44. Which of the following is not enclosed in mesorectal fasica?

a) Pararectal nodes

b) Superior rectal vein

c) Inferior rectal vein

d) Inferior mesenteric plexus

Correct Answer - C

Ans. c. Inferior rectal vein

Inferior rectal vein is not enclosed in mesorectal fascia.

`Mesorectum is enclosed by *mesorectal fascia* which is *derived from the visceral peritoneum,* and is also known as *visceral fascia of mesorectum, fascia propria of rectum or presacral wing of hypogastric sheath. Upper rectum* is derived from the embryological hind gut, it is *surrounded by mesorectum* and *its contents* namely *superior rectal artery* and its *branches, superior rectal vein* and *tributaries, lymphatic vessels* and *nodes along superior rectal artery, branches from inferior mesenteric plexus to innervate rectum* and loose adipose connective tissue down to the level of levator ani (pelvic floor).'

Mesorectal Fascia

- Mesorectum is enclosed by mesorectal fascia which is derived from the visceral peritoneum[Q], and is also known as visceral fascia of mesorectum, fascia propria of rectum or presacral wing of hypogastric sheath[Q].
- Upper rectum is derived from the embryological hind gut, it is surrounded by mesorectum[Q].

Contents of Mesorectal fascia

- Superior rectal artery and its branches[Q]
- Superior rectal vein and tributaries[Q]
- Lymphatic vessels and nodes along superior rectal artery[Q] Branches from inferior mesenteric plexus to innervate rectum[Q]
- Loose adipose connective tissue[Q] down to the level of levator ani (pelvic floor)

45. Sympathetic stimulation increases blood flow except:

a) Skin

b) Coronary circulation

c) Cerebral

d) Renal

Correct Answer - A
Ans. a. Skin
Sympathetic stimulation decreases blood flow in skin.
Sympathetic Stimulation

- Stimulation of sympathetic fibers causes vasoconstriction but it is not important, as the vasocontricor system is not well developed in cerebral vascular bed.
- Sympathetic stimulation increases myocardial blood flow through an increased metabolic demand and a predominance of beta-receptor activation.

46. All of the following are true about Kluver-Bucy syndrome expect:

a) Hypersexuality

b) Visual agnosia

c) Hypermetamorphosis

d) Intractable seizures

Correct Answer - D

Ans.D. Intractable seizures

Intractable seizures are not seen in Kluver-Bucy syndrome. Kluver-Bucy syndrome is characterized by visual agnosia, hypersexuality and hypermetamorphosis.

47. Peripheral resistance is best indicated by:

a) Diastolic blood pressure

b) Pulse pressure

c) Systolic resistance in aorta as it increases in its length

d) Mean arterial pressure, which is responsible for blood flow to an organ

Correct Answer - A

Ans. a. Diastolic blood pressure

Arterial hypertension is the result of abnormal flow/resistance relationships. Resistance to outflow consists of different components: the systolic component is the one generated by conductance vessels, whereas the diastolic component consists of peripheral resistance, which regulates peripheral blood supply due to the run-off of conductance vessels during left ventricular diastole. Thus, an increase in systemic resistance results in a rise in diastolic blood pressure. If the elasticity of conductance vessels decreases, diastolic run-off also decreases and diastolic blood pressure goes down. When this loss of elasticity occurs, the ejection force cannot be anymore offset by arterial distension, the pulse wave velocity increases and reflex waves to the heart arrive earlier, causing the systolic blood pressure to augment.

Such an augmentation, together with decreasing diastolic blood pressure results in an enhancement of the pulse pressure. When the stroke volume is normal, an increase in pulse pressure is, therefore, a marker of altered conductance. However, if, due to loss of elasticity of the conductance arteries diastolic blood pressure goes down, increasing systolic pressure also protects against a decrease in mean pressure.

Indeed, in conditions of elevated pulse pressure, the mean pressure

Indeed, in conditions of elevated pulse pressure, the mean pressure can be normal or high, indicating that when evaluating blood pressure all components should be taken into consideration. A high systolic blood pressure associated with a normal mean blood pressure is suggestive of a normal peripheral resistance.'

Diastolic Pressure

Systolic pressure is peak pressure reached during systole, similarly, diastolic pressure refers to lowest pressure during diastole.

Diastolic blood pressure is **an index to peripheral resistance.**

- Elasticity of aorta and large arteries is mainly responsible for origin and maintenance of diastolic pressure (by Windkessel elastic recoil effect).
- Because the elasticity is higher in younger subjects, diastolic pressure is maintained and pulse pressure is narrow.
- Because the elasticity is lower in old persons, diastolic pressure is decreased and pulse pressure is widened.

48. Blood testis barrier is located between:

a) Sertoli and sertoli cells

b) Leydig and myoid cells

c) Sertoli and germ cells

d) Sertoli spermatid

Correct Answer - A
Ans. a. Sertoli and sertoli cells
Blood testis barrier is located between sertoli and sertoli cells. Sertoli cells are *linked by tight junctions, the strongest intercellular barriers in the body. This arrangement forms the blood testes barrier.* Blood testes barrier *protects* the *developing sperms from immunologic attack* and *blood borne noxious agents.'*
Sertoli cells are specialized cells within the seminiferous tubules that are involved in the orchestration and coordination of all the key events during spermatogenesis and spermiogenesis.'

49. Ligament supporting the head of talus ?

a) Talonavicular ligament

b) Cervical ligament

c) Plantar calcaneonavicular ligament

d) Deltoid ligament

Correct Answer - C

Plantar calcaneonavicular ligament

- Spring ligament (Plantar calcaneonavicular ligament) connects the calcaneum with the navicular bone. o However, its principal job is to provide a sling for the talus, *to support the head of talus* (though it has no attachment to talus).
- This aids in supporting the weight of the body.
- Weaknes or lengthening along this ligament can cause flat foot.

50. Ciliary muscles develop It

a) Surface ectoderm

b) Neural crest cell

c) Mesoderm

d) Neuroectoderm

Correct Answer - B
Ans. b. Neural crest cell
Grays Anatomy 40/e p702, Ciliary muscles develop from Neural crest.

51. Sternocleidomastoid is supplied by all of the following artery except

a) Occipital Artery

b) Superior thyroid Artery

c) Posterior auricular Artery

d) Thyrocervical trunk

Correct Answer - D

Ans. d. Thyrocervical

- SCM receives its blood supply from branches of the occipital and posterior auricular arteries° (upper part of muscle), the superior thyroid artery° (middle part of muscle), and the suprascapular artery° (lower part of muscle).
- The sternocleidomastoid muscle flap is used in reconstructive surgery of the neck. The exact knowledge of its blood supply helps to minimize the risk of flap necrosis after transposition.

Vascular supply of Sternocleidomastoid Muscle

- SCM receives its blood supply from branches of the occipital and posterior auricular arteries (upper part of muscle),
- the superior thyroid artery (middle part of muscle), and the suprascapular artery (lower part of muscle).
- A superiorly based flap can be raised on SCM to include a paddle of skin supplied by perforator vessels. This flap has
- been used to reconstruct the lips, floor of mouth and inner aspect of the cheeks, however its use has been superseded
- by microvascular free transfer flaps or by conventional myocutaneous flaps such as the pectoralis major flap.

Blood Supply of Sternocleidomastoid

Upper Branches of Occipital artery°

Third	and posterior auricular arteries
	Branches of Superior thyroidal
Middle	arter-y° (42%), external
Third	carotid artery° (23%) or
	branches of both (27%)
Lower	Branches of Suprascapular
Third	artery°

52. Number of vertebrae is usually constant in

a) Cervical

b) Thoracic

c) Lumbar

d) Sacral

Correct Answer - A
Ans. a. Cervical Author please provide
* Illustrated Encyclopedia of Human Anatomic Variation: Opus V: Skeletal Systems: Vertebral column; Numerical Variation in Vertebral Column by Ronald A. Bergman, PhD; Adel K. Afifi, MD, MS; Ryosuke Miyauchi, MD.
* The usual grouping formula of 7 cervical, 12 thoracic, 5 lumbar, 5 sacral, and 4 coccygeal vertebrae is found in only about
* The cervical region is reported to be the most constant[Q], the coccygeal the most variable 20% of individuals studied.
* The number of elements of the vertebral column has been reported to vary between 32 and 35. Addition to a group is frequently seen, which occurs through the reduction in number of vertebrae of an adjacent group, the total number being
* The location of such a vertebra is predominately at the ends of the column and at the levels of transition between its regions. Thus, sacralization of the fifth lumbar, lumbar-like articular processes in the eleventh thoracic, and thoracic costal facets on the seventh cervical are observed.
*unchanged. In this variation, the vertebra added is usually intermediate in form between the adjacent groups.
* The levels of transition may be shifted cephalad, resulting in 23 mobile vertebrae, or shifted caudad, resulting in 25 presacral

vertebrae. Such variations may occur in 2-11% of the population
* The number of vertebrae comprising the sacrum maybe increased to six, resulting from the fusion of the first coccygeal (50% in whites, 30% in Negroes) or, less often, of the last lumbar (sacralization) (8% in whites, 11% in Negroes); or it maybe increased to seven, resulting from the fusion of the first coccygeal and the last lumbar (4% in whites, 1.5% in Negroes). The number maybe reduced to four, apparently by the lumbarization of the first sacral (0.4% in whites, 1.5% in Negroes).

Number of vertebrae

* Most constant: Cervical region°
* Most variable: coccygeal region°

53. The ligaments connecting the menisci to the tibia are known as:

a) Coronary

b) Arcuate

c) Transverse

d) Oblique

Correct Answer - A
Ans. a. Coronary

54. A person ss as taking something cisei i;,,,;kshelf falls on his arm laterally, after which he is not able to extend his wrist, unable to make a strong hand grip and there is loss of sensation on dorsum of hand and fingers. Which of the following structure is involved

a) Brachial plexus

b) C7 radiculopathy

c) Posterior cord injury

d) Radial nerve injury

Correct Answer - D

Ans. d. Radial nerve injury

- The patients who are not able to extend the wrist, unable to make a strong hand grip and if there is loss of sensation on dorsum of hand and fingers, it is suggestive of Radial nerve injury.

WRIST-DROP

- Due to palsy of **Extensor carpi radialis longus** and **brevis, Extensor carpi ulnaris.**

Radial Nerve Injury

- Radial nerve injury rarely occurs at sites other than humeral shaft or the posterior third of the dorsoradial forearmQ.
- Injuries to the radial nerve at this high level typically do not affect triceps function and elbow extensors are preservedQ.
- However, predictable motor paralysis results in loss of wrist

extension in addition to thumb extension and abduction, finger metacarpophalyngeal joint extension0**.**

- Wrist extension is necessary for proper flexor tendon tensioning and hence, grip is profoundly reduced **a**nd represents the most imopratnt functional deficit after high radial nerve palsy0.

Radial Nerve Injury

- Observation is indicated in most nerve palsies associated with closed humeral fracture

Motor Deficits

- **Wrist drop°:** Due to palsy of **Extensor carpi radialis longus** and **brevis, Extensor carpi ulnarisDifficulty in making a fist°:**
- Due to loss of **synergy between wrist extensors and finger flexors**

Sensory Deficits

- Sensory deficit in posterior lateral arm and dorsum of hand°

55. Epiglottis develops from which of the following structure

a) 2nd pharyngeal arch

b) 6th pharyngeal arch

c) 4th pharyngeal arch

d) 3rd pharyngeal arch

Correct Answer - C
Ans. c. 4th pharyngeal arch

56.

Which of the following muscle is not involved in damage of craninal part of accessory nerve

a) Cricopharyngeus

b) Palatopharyngeus

c) Stylopharyngeus

d) Salpingopharyngeus

Correct Answer - C
Ans.'c' Stylopharyngeus

57. Which of the following is true

a) Hypothalamus is part of brainstem

b) Occipital lobe is part of cerebral cortex

c) Medulla is part of limbic system

d) All of the above

Correct Answer - B
Ans. b. Occipital lobe is part of cerebral cortex

58. Cervical vertebra is differentiated from the thoracic verterbra by the presence of

a) Large vertebral body

b) Upwards facing facets

c) Triangular for amina

d) Foramen transversarium

Correct Answer - D
Ans. d. Foramen transversarium

59. Which of the following nerve nucleus underlies the facial colliculus?

a) Abducent

b) Vestibulocochlear

c) Facial

d) Trigeminal

Correct Answer - A
Ans. a. Abducent
'Facial colliculus is situated in the pons, It overlies the abdacent nucleus. The facial nerve originates from its nucleus and goes around the abducent nerve. This is called ss neurobiotaxis- Gray's 40/ep240

60. All of the following are true about cavernous sinus thrombosis except?

a) Most commonly spreads through ethmoid sinus

b) Loss of sensation around orbit

c) Loss of jaw jerk

d) Infection can spread to cavernous sinus from danger area of face via inferior ophthalmic vein

Correct Answer - C

Ans. c. Loss of jaw jerk

Any spreading infection involving the upper nasal cavities, paranasal sinuses, cheek (especially near the medial canthus), upper lip, anterior nares or even an upper incisor or canine tooth, may very rarely lead to septic thrombosis of the cavernous sinuses; infected thrombi pass from the facial vein or pterygoid venous complex into the sinus via either ophthalmic veins or emissary veins that enter the cranial cavity through the foramen ovale. This is a critical medical emergency with a high risk of

Cavernous Sinus Thrombosis

- Usually results from infection of ethmoid and sphenoid sinusesQ

Route of Spread

Ethmoid sinus (MC) via ophthalmic veins°	Orbit by ophthalmic veins°
Sphenoid sinus by direct spread°	Upper lid via angular vein and ophthalmic veins°
Frontal sinus via	

supraorbital and ophthalmic veins°	Ear by petrosal venous sinuses

Clinical Features:

- Onset is abrupt with fever, chills and rigor
- Involvement of 3rd, 4th, 5th and 6th cranial nervee
- Chemosis of conjunctiva[Q]
- Proptosis of eye with limited movements[Q]
- Pupils are dilated and fixed[Q] (due to involvement of sympathetic plexus around carotid artery)
- Decreased vision[Q](due to optic nerve damage)
- Decreased sensation in distribution of 5" nerve (ophthalmic division) and engorgement of retinal vessels[Q]

Treatment:

- Antibiotics in high doses for 4-6 weeks and drainage of involved sinuses[Q]

61. Membrana tectoria is continuation of:

a) Anterior longitudinal ligament

b) Posterior longitudinal ligament

c) Anterior atlanto-occipital membrane

d) Posterior atlanto-occipital membrane

Correct Answer - B
Ans. b. Posterior longitudinal ligament
'The membrana tectoris (occipitoaxial ligaments) is situated within the vertebrul canal. It is u broad, strong band, which covers the dens and its ligaments, and appears to be a prolongation upward of the posterior longitudinal ligament of the
vertebral column. It lies posterior to the transverce ligament. It is attached inferiorly to the posterior surface of the body of the axis and superiorly lo the basiocciput (within the foramen magnum)- BDC 6/e Vol- III/ep173

62. All of the following are true about sphincter urethrae except?

a) Voluntary

b) Supplied by pudendal nerve

c) Arises from ischiopubic ramus

d) Located at bladder neck

Correct Answer - D
Ans. d. Located at bladder neck
External urethral sphincter
Voluntary
Made of striated muscle fibres
It is roughly pear shaped, being thickest near the middle of urethra and thicker in front than at sides or back.
Supplied by perineal branch of pudendal nerve (S2-S4)
Origin: From ischiopubic rami on each side
Internal urethral sphincter
Involuntary
Made of smooth muscle
Continuation of detrusor muscle
It is an extension of circular muscle at the bladder neck
Supplied by sympathetic nerves (T10 -L1)
Females lack internal urethral sphincter

63. When pronation of the foot occurs, axes of which joints move in parallel direction?

a) Talonavicular- Calcaneocuboid

b) Calcaneocuboid-Subtalar

c) Talocrural-Subtala

d) Midtarsal-Tarsometatarsal

Correct Answer - A
Ans. a. Talonavicular-Calcaneocuboid
An explanation of the concept of 'unlocking' the foot has been described by Root, Orien and Weed, although the exact mechanism is still unknown. The mid-tarsal joint comprises the talo-navicular joint (longitudinal axis) and the calcaneo-cuboid joint (oblique axis). When the subtalar joint is in neutral these two axis are relatively divergent. However, as the subtalar joint pronates, these two axis become parallel.'-

64. 'Turkish saddle' refers to:

a) Pituitary gland

b) Amygdaloid body

c) Hypothalamus

d) Uncus

Correct Answer - A
Ans. a. Pituitary gland
Sella turcica: A depression in the base of the skull where the pituitary gland is situated. It was called the sella turcica (the Turkish saddle) because of its resemblance to a saddle used by the Turks which had supports in the front and back

65. All of the following are made of dense collagen except:

a) Aponeurosis

b) Ligament

c) Tendon

d) Periosteum

Correct Answer - D
Ans. d. Periosteum
Periosteum is not formed by dense regular connective tissue.
'Structures formed by dense regular connective tissue are tendons, ligaments and aponeurosis
Dense Regular Connective Tissue (DRCT)

- *P*rovides connection between different tissues in the human body
- The collagen fibers are bundled in a parallel fashion.
- In this kind of tissue, elastic and reticular fibers are completely absent.
- Dense regular tissue can be divided into white fibrous connective tissue and yellow fibrous connective tissue. Both of these types can be arranged in cord or sheet arrangement.

Dense Regular Connective Tissue
Cord arrangement

- Bundles of collagen and matrix are distributed in regular alternate patterns

Sheet arrangement

- Collagen bundles and matrix are distributed in irregular patterns,
- Similar to areolar tissue

Dense Regular Connective Tissue
Structures formed

Tendons:

- Connect muscle to bone[Q]
- Derive their strength from the regular, longitudinal rangement of bundles of collagen fibers[Q]

Ligaments

- Bind bone to bone[Q]
- Similar in structure to tendons.

Aponeurosis

Functions

- *H*as great tensile strength° that resists pulling forces especially well in one direction.
- Has a very poor blood supply° (damaged tendons and ligaments are slow to heal)

66. All of the following are carried by the dorsal column except?

a) Pain

b) Proprioception

c) Vibration

d) Touch

Correct Answer - A
Ans. a. Pain
The dorsal funiculus consists of two large ascending tracts, the fasciculus gracilis and fasciculus cuneatus that are known as dorsal columns.
They contain a high proportion of myelinated fibres carrying proprioceptive (position sense and kinaesthesia), touch, pressure and vibratory sensation to higher levels.

67. All of the following are derived from ectoderm except:

a) Hair follicles

b) Arrector pili

c) Sebaceous glands

d) Mammary gland

Correct Answer - B
Ans. b. Arrector pili
Arrector pili is a smooth muscle in the dermis, derived from lateral plate mesoderm."— Langmans Medical embryology 12/e p341
"The arrector pili is a mesodermally derived smooth muscle that lifts the hair to a nearly vertical position in a cold environment."- Human embryology and developmental biology by Carlson-5/chapter-9/integumentary-system

68. Which of the following muscles is not a derivative of mesoderm?

a) Skeletal muscles

b) Smooth muscles

c) Cardiac myocyte

d) Dilators of pupil

Correct Answer - D
Ans. d. Dilators of pupil
Smooth muscles of iris (constrictor and dilator pupillae)

- The sphincter and dilator pupillae muscles of the iris are derived from the ectoderm.
- The region between the optic cup and the overlying surface epithelium is filled with loose mesenchyme.
- The sphincter and dilator pupillae muscles form in this tissue.

Derivatives of Mesoderm

- All connective tissue i.e. superficial and deepfascia(ligaments, tendons, aponeurosis, dermis of skin', adipose reticular tissue, cartilage and bone)
- All cardiovascular system i.e. heart, blood vessels, lymphatic and blood cells.
- All Musculoskeletal system i.e. bone, cartilage, tendon, ligaments and muscles (smooth, striated and cardiac) musculature of iris (sphincter and dilator pupillae) which are ectodermale
- All Reproductive system i.e. ovary, uterine tubes, uterus and upper vagina in females; testis, epididymis, ductus deferens, prostate (inner glandular zone) seminal vesicle and ejaculatory duct in males.
- Except epithelium of greater part of vagina, vestibule and inner surface of labia minora in female and greater part of prostate (except

inner glandular zone) is endodermal.

- Outer surface of labia ininora and whole labia majora are ectodermal
- All urinary system i.e. kidney, ureters, trigone of bladder, posterior part of female urethra, posterior part of urethra (upper half) of males and inner glandular zone of prostate
- Epithelium of urinary bladder (except trigone), female urethra (except posterior wall), male urethra (except prostatic part which is mesodermal and penile urethra which is ectodermal) and most of prostate (except inner glandular zone) are endodermal
- Mesothelial lining of –pleural, pericardial, and peritoneal cavities[e]; and of tunica vaginalis, bursae and
- Dentine of teeth[e]; (enamel is ectodermal')
- Duramater and Microgliae
- Except these all other nervous system i.e. neurons, neuroglia and schwann cells are ectodermal
- Eye i.e. substance of cornea, sclera, choroid, ciliary body and iris
- Except anterior epithelium of cornea, epithelium of conjunctiva, epithelium of ciliary and iris; iris muscles and lens are ectodermal.

69. Venous drainage of esophagus is into the:

a) Azygous and inferior thyroid veins

b) Azygous, inferior thyroid and left gastric veins

c) Azygous, inferior thyroid and right gastric veins

d) Superior thyroid, inferior thyroid veins, azygous and hemi-azygous veins

Correct Answer - B
Ans. b. Azygous, inferior thyroid and left gastric veins
Major part of the venous drainage from the esophagus is by azygous, inferior thyroid and left gastric veins.
"Venow bloodfrom the esophagus drains into a submucosal plexus. From the cemical esophagus, veins drain into the inferior thyroid vein. From the thoracic esophagas, veins drain into the arygos veins, hemia4ygos, intercostal, and bronchial veins. From the abdominal portion, esophagus veins drain into the left gastric vein."

70. The most common variant in the blood supply of colon is:

a) Absent right colic artery

b) Absent middle colic artery

c) Absent left colic artery

d) Absent superior rectal artery

Correct Answer - A
Ans. a. Absent right colic artery
The most common variant in the blood supply of colon is absent right colic artery.

Variation in the Blood Supply of Colon

- Right colic artery is a small vessel that is highly variable in its anatomy and may be absent°.
- Right colic artery most commonly arises as a common trunk with the middle colic artery. Alternatively it may arise as a separate branch from the right side of the superior mesenteric artery, or from the ileocolic artery (when it is referred to as an accessory right colic artery), and occasionally it may be absent.
- Right colic artery is highly variable in its anatomy

71. Which of the following is not true about blood testis barrier?

a) It is formed by Sertoli cells

b) It is formed before primary spermatogenesis

c) Any rupture of barrier can cause immune response to germ cells

d) Germ cells are not necessary for formation of the barrier

Correct Answer - B
Ans. b. It is formed before primary spermatogenesis
Blood Testis Barrier:
Germ cells are not necessarv for formation of the barrier
Fomred by Sertoli cells (Blood testis barrier is located between sertoli and sertoli cells.)
Any rupture of barrier can cause immune response to germ cells:
Blood testes barrier protects the developing sperms from immunologic attack and blood borne noxious agents.
Provide support, nutrition to developing spermatozoa
Protect developing germ cells by forming Blood Testis Barrier

72. Which of the following is not true about dura mater?

a) It is the outermost layer of the cranial meninges

b) It has periosteal and meningeal layer

c) Dural venous sinuses lie below the meningeal layer

d) It is supplied by a branch of the V cranial nerve

Correct Answer - C
Ans. c. Dural venous sinuses lie inner to the meningeal layer
Dural venous sinuses lie outer to the meningeal layer i.e. between outer endosteal and inner meningeal layers, not the
inner to the meningeal layer.
"Separations between endosteal and meningeal dura, or between two liyers of meningeal dura, create spaces called
dural venous sinases, through which the blood is drained from the neurocranium.
The dura mater is the outermost, thickest and toughest membrane cevering the brain.

73. Which of the following structures seen in the cavernous sinus?

a) Maxillary division of V nerve

b) Mandibular division of V nerve

c) Internal carotid artery

d) Facial nerve

Correct Answer - C
Ans. c. Internal carotid artery
Contents of the cavernous sinus
Structures in the lateral wall of the sinus
Oculomotor (lll) nerve
Trochlear (lV) nerve
Ophthalmic (1st division of V) nerve
Trigeminal ganglion
Internal carotid artery
Abducent (Vl) nerve

74. Medulla receives its blood supply from all of the following arteries except:

a) Anterior spinal artery

b) Posterior inferior cerebellar artery

c) Vertebral artery

d) Superior cerebellar artery

Correct Answer - D
Ans. d. Superior cerebellar artery
Medulla is supplied by anterior spinal artery, branches of vertebral artery and posterior inferior cerebellar artery (but not
the Superior cerebellar artery).
Medullary Arterial Supply:
Posterior inferior cerebellar - dorsolateral areas.
Anterior spinal - medial area.
Anterior inferior cerebellar - ventro-lateral area.

75. Which following is supplied by contralateral nerve nucleus?

a) Superior rectus

b) Inferior rectus

c) Medial rectus

d) Inferior oblique

Correct Answer - A
Ans. a. Superior rectus
Superior rectus and superior oblique muscles are supplied by opposite side (contralateral) nuclei of 3$^{r\circ}$ and 4^{1h} cranial nerves respectively.

Subnuclei of Oculomotor (CN III) nucleus and their Functions

Subnucleus	Muscles innervated	Side innervated
Dorsal	Inferior rectus^{Q}	Ipsilateral^{Q}
Intermediate	Inferior oblique^{Q}	Ipsilateral^{Q}
Ventral	Medial rectus^{Q}	Ipsilateral^{Q}
Medial	Superior rectus^{Q}	Contralateral^{Q}
Central caudal	Levator palpebrae superioris^{Q}	Bilateral^{Q}
Edinger-Westphal (Parasympathetic	Pupillary constrictors and ciliary muscles	Bilateral^{Q}

76. Trigeminal nerve supplies all of the following muscles except:

a) Stylohyoid

b) Medial pterygoid

c) Lateral pterygoid

d) Tensor veli palatini

Correct Answer - A
Ans. a. Stylohyoid

Mandibular nerve, which is a branch of the trigeminal nerve, innervates the muscles derived from the first pharyngeal arch, viz. medial pterygoid, lateral pterygoid, temporalis, masseter, tensor tympani, tensor veli palatine, mylohyoid and anterior belly of digastric

77. Facial nerve gives out secretomotor fibres to all of the following except:

a) Lacrimal gland

b) Parotid gland

c) Submandibular gland

d) Nasal glands

Correct Answer - B
Ans. b. Parotid gland
The parotid gland receives parasympathetic secretomotor innervation front preganglionic fibers that arise in the inferior salivatory nucleus.

78. Pronator teres syndrome is related to which nerve ?

a) Radial

b) Median

c) Ulnar

d) Axillary

Correct Answer - B
Ans. is 'b' i.e., Median

79. Purkinje cells of cerebellum are connected to ?

a) Basket cells

b) Stellate cells

c) Deep cerebellar nuclei

d) All of the above

Correct Answer - D
Ans. is 'd' i.e., All of the above

- The two main inputs to the cerebellar cortex are climbing fibers and mossy fibers, which are excitatory.
- The climbing fibers come from a single source, the inferior olivary nuclei and directly projects to the primary dendrites of a purkinje cell.

80. Right superior intercostal vein drains into ?

a) Brachiocephalic vein

b) Azygos vein

c) IVC

d) None of the above

Correct Answer - B
Ans. is 'b' i.e., Azygos vein

- Right superior intercostal vein drains into azygos vein.
- Left superior intercostal vein drains into left brachiocephalic vein.

The right superior intercostal vein drains the 2nd, 3rd, and 4th posterior intercostal veins on the right side of the body. It flows into the azygos vein.
The left superior intercostal vein drains the 2nd and 3rd posterior intercostal veins on the left side of the body. It drains into the azygos vein or left brachiocephalic vein.

81. Vaginal wall is derived from ?

a) Mesoderm of genital ridge

b) Endoderm of genital ridge

c) Mesoderm of urogenital sinus

d) Endoderm of urogenital sinus

Correct Answer - D
Ans. is 'D' i.e., Endoderm of urogenital sinus
Vagina is derived from two sources :?
1. Upper 2/3" : It is derived from Utero-Vaginal Canal, **i.e.** the fused part of paramesonephric duct. Therefore, this part is mesodermal in origin.
2. Lower 1/3" : It is derived from sinovaginal bulb which inturn is derived from urogenital sinus. Thus, this part is endodermal in origin.

82. Structure passing through superior orbital fissure?

a) Oculomotor nerve

b) Trochlear nerve

c) Superior ophthalmic vein

d) All of the above

Correct Answer - D
Ans. is 'd' i.e., All of the above
Structures passing through superior orbital fissure are :-

1. Middle part (within the ring) Upper and lower division of oculomotor nerve, nasociliary nerve, abducent nerve.
2. Lateral part (above the ring) :- Trochlear nerve, frontal nerve and lacrimal nerve, superior ophthalmic vein, recurrent menigeal branch of lacrimal artery, orbital branch of middle meningeal artery and sometimes meningeal branch of ophthalmic artery.
3. Medial part (below the ring) :- Inferior ophthalmic vein, sympathetic nerves around ICA.

83. Dorello's canal transmits in tip of temporal bone

a) Middle meningeal artery

b) Mandibular nerve

c) Superior alveolar branch of maxillary

d) Abducent nerve

Correct Answer - D
Dorello canal is an opening to cavernous sinus that transmit abducent nerve underneath the superior petrosal sinus.

84. Which of the following is a holocrine gland:

a) Sweat gland

b) Breast

c) Pancrea

d) Sebaceous gland

Correct Answer - D

- **Sebaceous gland is a holocrine gland** since the discharged secretion contains entire secreting cells.
- Sweat glands are of two types: Eccrine (merocrine) is more common in occurence as compared to apocrine variety.
- Breast (mammary gland) is modified sweat gland of apocrine variety.
- Another example for similar type is ceruminous (wax) gland in the ear.
- Pancreas is a mixed (exocrine & endocrine) gland.
- Exocrine secretory units are usually merocrine type.

85. The knowledge about the biomechanics of the muscles attached around the shoulder joint, known as 'rotator cuff muscles' has increased exponentially. However, the role of one of the rotator cuff muscles, which is also now known as 'forgotten rotator cuff muscle' has been ignored or less importance has been attached to its role. Which of the following muscles best describes this description?

a) Supraspinatus

b) Infraspinatus

c) Teres minor

d) Subscapularis

Correct Answer - D

Answer- D (Subscapularis)

Subscapularis is the major and most powerful muscle of the rotator cuff and has an enormous meaning in the gleno-humeral stability.

- Lo and Burkhart even tagged the subscapularis tendon hypercritically as the ‘forgotten tendon'.

86. Which of the following structure is not present on floor of third ventricle?

a) Optic stalk

b) Third nerve

c) Infundibulum

d) Mammillary body

Correct Answer - B
Answer- B (Third nerve)
The third nerve (Oculomotor) does not form the floor of the third ventricle although it lies in close relation to the floor.
The anterior wall of the third ventricle is formed by Lamina terminalis, Anterior commissure, Anterior columns of the fornix
The posterior wall is formed by the Pineal body, Posterior commissure, Cerebral aqueduct.
The roof is formed by Body of fornix and the ependyma lining the undersurface of the tela choroidea of the third ventricle.
The floor of the third ventricle is formed by Optic chiasma, Tuber cinereum, Infundibulum, the Mammillary bodies, Posterior perforated substance, and Tegmentum of the midbrain.
The lateral wall is formed by the Medial surface of the thalamus, Hypothalamus, and the Hypothalamic sulcus.

87. Which of the following does not contribute to the boundaries of facial recess?

a) Facial nerve

b) Stapedius tendon

c) Chorda tympani nerve

d) Short process of incus bone

Correct Answer - B
Answer- B (Stapedius tendon)

- Facial recess or the posterior sinus is a depression in the posterior wall lateral to the pyramid.
- It is bounded medially by the vertical part of VIIth nerve, laterally by the chorda tympani and above, by the fossa incudis

88. Urethral crest is an elevation seen in urethra due to:

a) Prostatic glands

b) Insertion of detrusor muscle

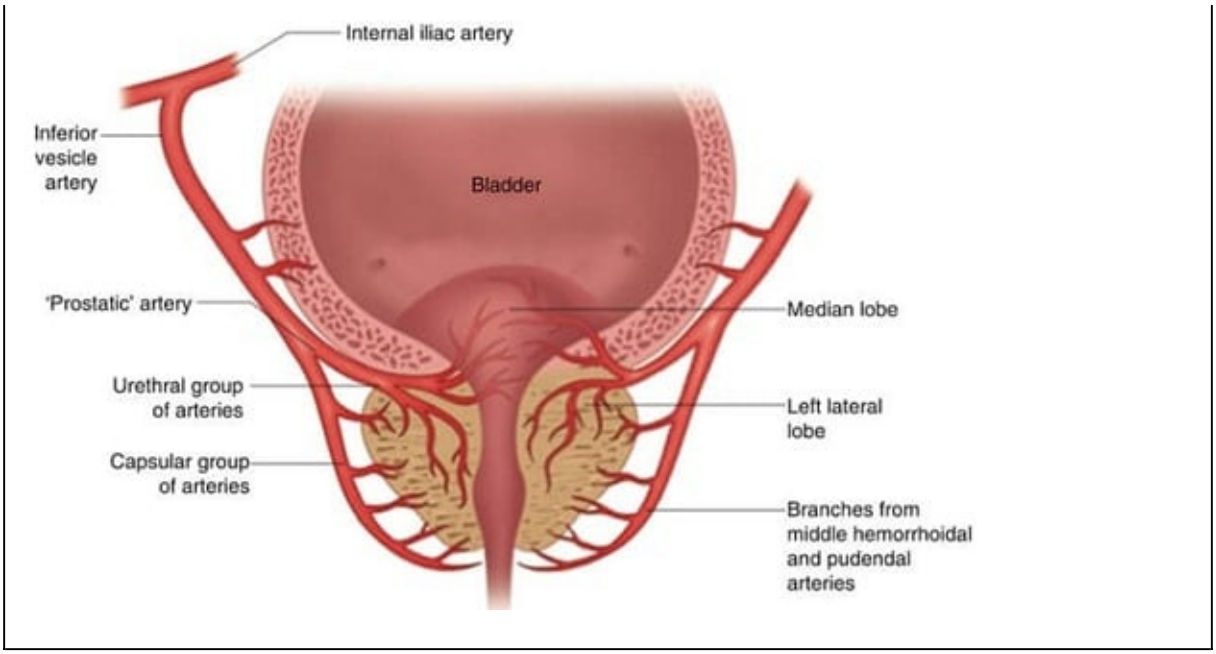
c) Insertion of trigone

d) Preprostatic internal sphincter

Correct Answer - A

Answer- A (Prostatic glands)

- The urethral crest is an anatomical feature present in the urinary system of both males and females.
- The prostatic portion (pars prostatica), the widest and most dilatable part of the canal, is about 3 cm long.
- Upon the posterior wall or floor is a narrow longitudinal ridge, the urethral crest, formed by an elevation of the mucous membrane and its subjacent tissue.
- On either side of the crest is a slightly depressed fossa, the prostatic sinus, the floor of which is perforated by numerous apertures, the orifices of the prostatic ducts from the lateral lobes of the prostate; the ducts of the middle lobe open behind the crest.


Internal iliac artery
Inferior vesicle artery
Bladder
'Prostatic' artery
Median lobe
Urethral group of arteries
Left lateral lobe
Capsular group of arteries
Branches from middle hemorrhoidal and pudendal arteries

89. Which of the following does not contribute to the formation of anorectal ring in human beings?

a) External anal sphincter

b) Puborectalis

c) Anococcygeal raphe

d) Internal anal sphincter

Correct Answer - C
Answer- C (Anococcygeal raphe)
Anorectal ring is a muscular ring present at the anorectal junction. It is formed by the fusion of the Puborectalis, uppermost fibres of external sphincter and the internal sphincter.
(Ref- BDC 5/e Vol- III/p428, Maingot 11/e p 663)

90. All of the following bones are the parts of inferior wall of orbit except:

a) Ethmoid

b) Maxillary

c) Palatine

d) ZygomaticWhile

Correct Answer - A
Answer- A (Ethmoid)
Kanski 5/e p558

- 'The inferior wall of orbit consists of three bones: zygomatic, maxillary, and palatinea'.

Boundaries of the Orbit

Roof	• Lesser wing of the sphenoid • Orbital plate of the plate
Lateral wall	• Greater wing of the sphenoid • Zygomatic
Inferior wall	• Zygomatic • Maxillary • Palatine
Medial wall	• Frontal process of the maxilla • Lacrimal • Ethmoid • Boby of sphenoid

91. Lacrimation is affected due to damage to which of the following nerves?

a) Nasociliary nerve

b) Greater petrosal nerve

c) Trigeminal nerve

d) Anterior ethmoid nerve

Correct Answer - B
Answer- B (Greater petrosal nerve)
The greater petrosal nerve is a branch of the facial nerve. It gives secretomotor fibers to the pterygopalatine ganglion along with lesser petrosal nerve. The postganglionic fibers innervate the lacrimal gland and are responsible for the formation of tears.
Greater petrosal nerve damage will deprive the lacrimal gland of its secretomotor fibers and this would lead to the absence of tears.
Greater petrosal nerve damage can happen in case of intrapetrosal mass lesions, a trauma in case of temporal bone injuries, etc.

92. While performing drainage of fluid from the pleural cavity, the needle is introduced through all of the following structures except-

a) Skin

b) Thoracic fascia

c) Pulmonary pleura

d) Intercostal muscles

Correct Answer - C
Answer- C (Pulmonary pleura)
(Ref. BDC 5/e p Vol-l/p2l2)

- Pleural space lies between the parietal pleura and the visceral (Pulmonary) pleura.
- Parietal pleural lines the inner surface of the chest wall.
- Visceral pleura is invested on the surface of the lung.
- Thus to reach the pleural space for pleural fluid tapping, parietal pleura is pierced and not the visceral pleura.

93. Which of the following is the only complete cartilage ring in the respiratory tree?

a) Cricoid cartilage

b) Thyroid cartilage

c) Cunieform cartilage

d) Epiglottis

Correct Answer - A
Answer- A (Cricoid cartilage)
(Ref: BDC 5/e Vol lII/p238)

- Complete cartilage ring is seen in Cricoid cartilage.
- Cricoid cartilage is shaped like a ring. It encircles the larynx below the thyroid cartilage. It is thicker and stronger than the thyroid cartilage.

94. Lower two parts of sternal body is fused by:

a) 8 years

b) 10 years

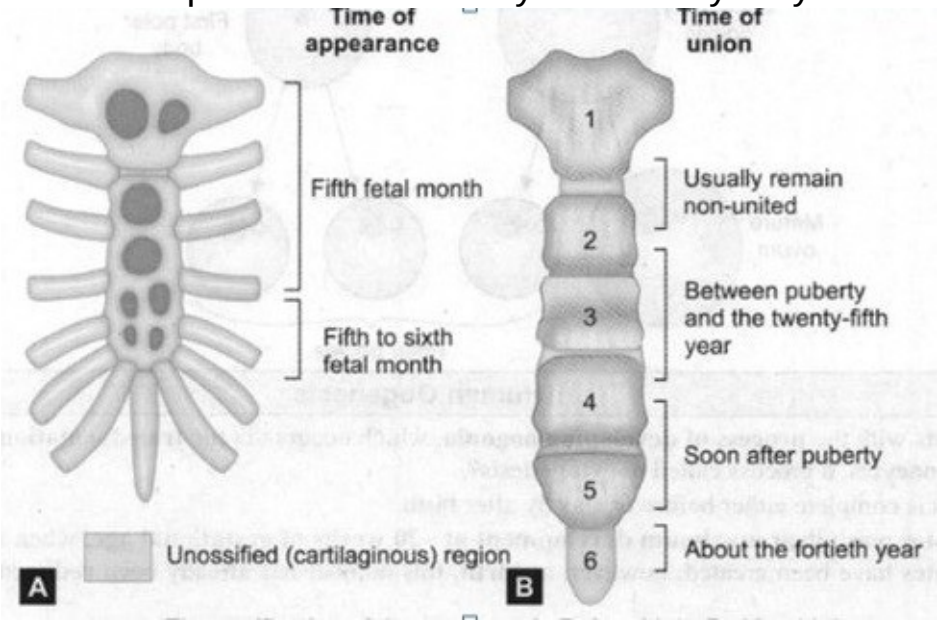
c) 12 years

d) 14 years

Correct Answer - D

Ans: D. 14 years

- Lower two parts of sternal body is fused by 14 years.



95. Oogonia at the time of birth, is present in which of the following stage of meiosis?

a) Prophase I

b) Metaphase I

c) Anaphase I

d) Telophase I

Correct Answer - A

Ans: A. Prophase I

- Oogonia at time of birth - In Prophase I.
- Biological definition of primary oocyte - Cell whose primary function is to divide by the process meiosis.
- Meiosis I of ootidogenesis begin during embryonic development.
- Halts in diplotene stage of prophase I, until puberty.

96. All of the following are branches of external carotid artery except?

a) Superior thyroid artery

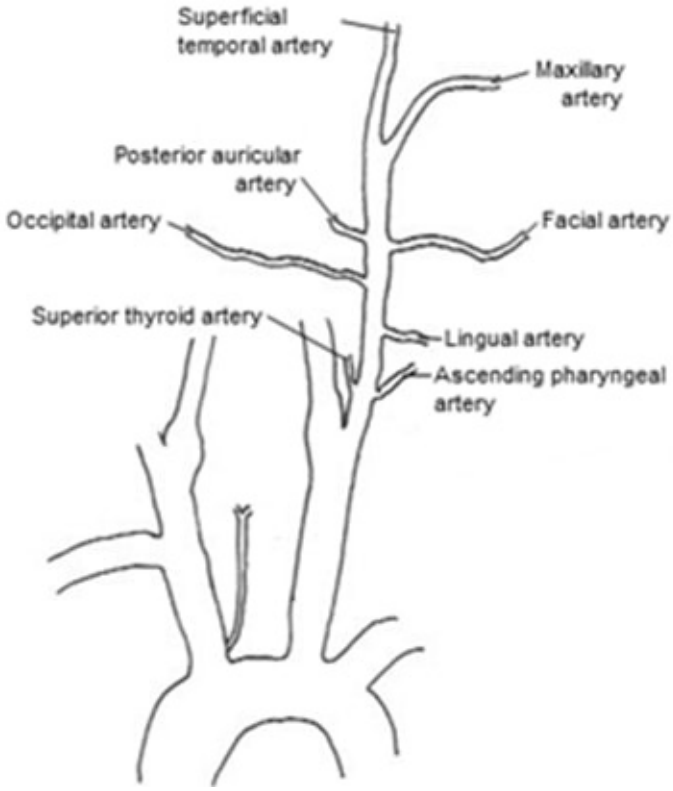
b) Transverse cervical artery

c) Ascending pharyngeal artery

d) Superficial temporal artery

Correct Answer - B

Ans: B Transverse cervical artery



Branches of External Carotid

Superior thyroid artery°

Anterior	Lingual artery
	Facial artery
Posterior	Occipital artery°
	Posterior auricular°
Medial	**Ascending pharyngeal** artery°
Terminal	Maxillary artery°
	Superficial temporal artery

Transverse cervical artery is a branch of thyrocervical trunk.

97. Which of the following muscle is not inserted to the greater tubercle of humerus?

a) Supraspinatus

b) Infraspinatus

c) Teres minor

d) Subscapularis

Correct Answer - D

Ans: D Subscapularis

- Subscapularis muscle - Largest component of the posterior wall of the axilla.
- Origin: From subscapularis fossa & also fills it.
- Insertion: To lesser tubercle of humerus.

Insertions of greater tubercle of humerus

- Supraspinatus
- Infraspinatus
- Teres minor

98. Card test is done for which of the following muscle?

a) Palmar interossei

b) Dorsal interossei

c) Lumbricals

d) Adductor pollicis

Correct Answer - A

Ans: A. Palmar interossei

NerveTest	Test	Muscle
Ulnar nerve	Book test	Adductor pollicis
	Card test	Palmar interossei
	Froment's sign	Flexor pollicis substitutes for adduc? tor pollicis

99. In which of the following microvilli are not present?

a) Gallbladder

b) Duodenum

c) Collecting duct

d) Proximal convoluted tubule

Correct Answer - C

Ans: C. Collecting duct

- Microvilli - Finger-like cell surface extensions.
- Usually 0.1 mm in diameter & up to 2 mm long.
- Absorptive surfaces of epithelial enterocytes of small intestine - Arranged in regular parallel series & constitute striated border.
- In gallbladder epithelium & proximal kidney tubules – Are less regular constitute “brush border”.

100. Independent assortment of maternal and paternal chromosome occurs at which stage of spermatocyte maturation:

a) Spermatogonia to primary spermatocyte

b) Primary spermatocyte to secondary spermatocyte

c) Secondary spermatocyte to spermatids

d) Spermatid to spermatozoa

Correct Answer - B

Ans: B. Primary spermatocyte to secondary spermatocyte

- During spermatogenesis - Independent assortment of paternal & maternal chromosomes occurs during meiosis I.
- Also, primary spermatocyte (2n) is converted into two secondary spermatocytes.

101. Which of the following is not a support of the uterus?

a) Urogenital diaphragm

b) Pelvic diaphragm

c) Perineal body

d) Rectovaginal septum

Correct Answer - D

Ans: D. Rectovaginal septum

- The rectovaginal septum is not a support of the uterus.

Supports of the Uterus

Primary Supports	Secondary Supports (Formed by peritoneal Ligaments)
Muscular or Active support:	
Pelvic diaphragm	Broad ligament
Perineal body	Uterovesical fold of peritoneum
Distal urethral sphincter mechanism	

Ligamentous (Fibromuscular or Mechanical) support:

Transverse cervical ligaments of Mackenrodt or Cardinal
Uterosacral ligament
Round ligament of uterus
Pubocervical ligament

102. All of the following are derived from mesonephros except:

a) Paroophoron

b) Vas deferens

c) Epididymis

d) Glomerulus

Correct Answer - D

<u>Ans: D. Glomerulus</u>

Mesonephric / Wolffian duct (Main genital duct of males):

I. Structure formed: "PUT A DEEP semen"

- Posterior wall of prostate urethra, cranial to openings of ejaculatory duct.
- Ureteric buds forming ureter, pelvis, calyces & collecting tubule.
- Trigone of bladder.
- Appendix of epididymis (not testis).
- Ductus deferens.
- Epididymis.
- Ejaculatory ducts.
- Prostate (mesodermal part).
- **Seminal** vesicles.

II. Remnants: "SIP":

- Superior aberrant ductile (epigenital tubule)
- Inferior aberrant ductile.
- Paradidymis (para-genital tubule).

103. In gene studies, the specific site to which the enzyme CRE recombinase binds is:

a) RE site

b) LoxP site

c) NT site

d) FRT site

Correct Answer - B
Ans: B. LoxP site
Cre-Lox recombination - Known as “Site-specific recombinase technology”.
* Widely used to carry out deletions, insertions, translocations & inversions at specific sites in cellular DNA.
* Consists of Cre-recombinase enzyme.
  - Recombines a pair of short target sequences called “Lox sequences”.
* Cre enzyme & original Lox site – Referred as “LoxP sequence”
  - Derived from bacteriophage P1.
*** Lox P (locus of X-over P1) - Site on bacteriophage P1 consisting of 34 bp.**
Ref https://en.wikipedia.oig/wiki/Cre-Lox_recombination)

104. Which of the following is not a content of mesorectal fascia?

a) Inferior rectal vein

b) Superior rectal vein

c) Pararectal lymph node

d) Inferior mesenteric plexus

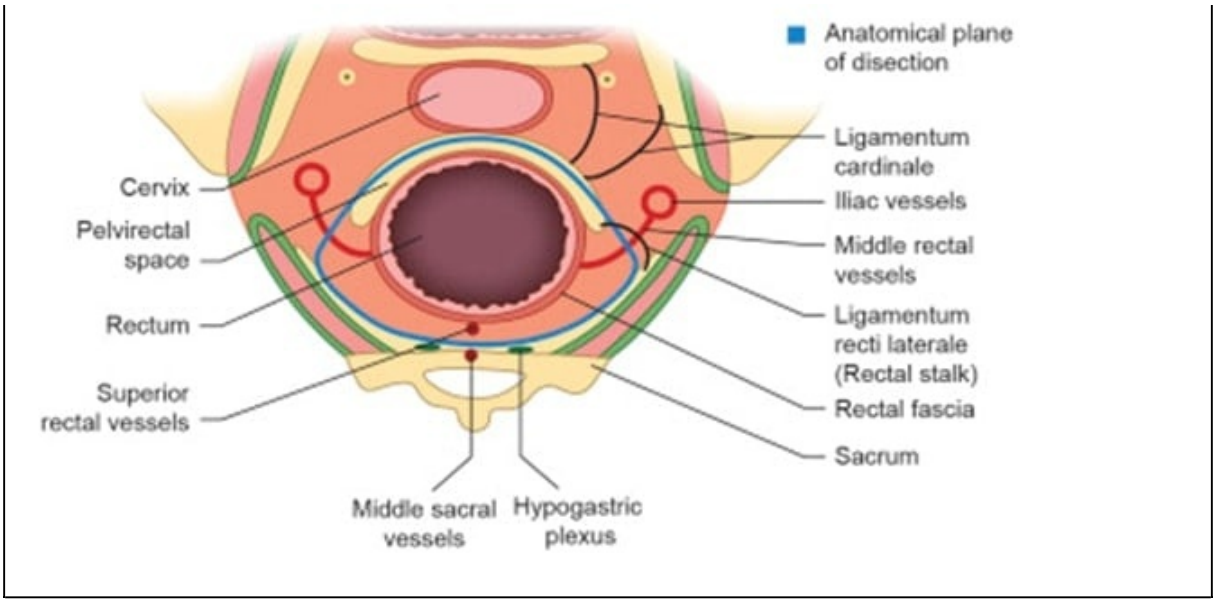
Correct Answer - A

Ans: A. Inferior rectal vein

- Mesorectum is enclosed by mesorectal fascia, which is derived from the visceral peritoneum.
- Known as visceral fascia of mesorectum, fascia propria of rectum or presacral wing of hypogastric sheath.
- Upper rectum is derived from the embryological hind gut, it is surrounded by mesorectum°.

Contents of Mesorectal fascia

- Superior rectal artery and its branches
- Superior rectal vein and tributaries
- Lymphatic vessels and nodes along superior rectal arteries.
- Branches from inferior mesenteric plexus to innervate rectum.
- Loose adipose connective tissue down to the level of levator ani (pelvic floor).


Anatomical plane of disection
Ligamentum cardinale
Iliac vessels
Middle rectal vessels
Ligamentum recti laterale (Rectal stalk)
Rectal fascia
Sacrum
Cervix
Pelvirectal space
Rectum
Superior rectal vessels
Middle sacral vessels
Hypogastric plexus

105. Reticular fibers of collagen tissues are present in all of the following except:

a) Thymus

b) Spleen

c) Bone marrow

d) Lymph node

Correct Answer - A

Ans: A. Thymus

- Reticular fibers of collagen tissues are present in Spleen, Bone marrow & Lymph node but not in thymus.

Reticulin:

- Type of fiber in connective tissue.
- Composed of type III collagen.
- Secreted by reticular cells.
- Reticular fibers crosslink to form a fine meshwork.
- Acts as a supporting mesh in soft tissues such as liver, bone marrow & tissues and organs of lymphatic system.

106. Sensory supply of cornea is by?

a) Infraorbital nerve

b) Supraorbital nerve

c) Infratrochlear nerve

d) Nasolacrimal nerve (probably printing mistake - probably Nasociliary nerve).

Correct Answer - D

Ans: D. Nasolacrimal nerve (probably printing mistake - probably Nasociliary nerve).

Cornea:

- Richly supplied by nerves (without myelin sheaths & Schwann cell sheath).
- Extremely sensitive structure - Due to its dense nerve supply.
- Ooriginate from small ophthalmic division of trigeminal nerve, mainly by long ciliary nerve.
- Long ciliary nerve - Branch of Nasociliary nerve.

107. All of the following have general visceral efferent fibers except:

a) Facial nerve

b) Olfactory nerve

c) Oculomotor nerve

d) Glossopharyngeal nerve

Correct Answer - B

Ans: B. Olfactory nerve

Olfactory nerve does not have general visceral efferent fibers.

Functional Division of Cranial Nerve Nuclei

Sensory / Afferent	**Motor / Efferent**
	1. General
	• Supply striated muscle derived from somites &
1. General Somatic	• in tongue & eye movements i.e.
• Sensory nucleus of trigeminal (descending & mesencephalic nucleus of V [h]	• Hypoglossal nucleus of 12th
• Receive sensation of face	• Oculomotor nucleus of 3rd
	• Trochlear nucleus of 4th
	• Abducent nucleus of 6th
	2. General
	• Edinger Westphal nucleus of 3rd
2. General Visceral	• Superior salivatory nucleus of 7[th]
• Nucleus of tractus solitaries.	• Inferior salivatory nucleus
• Receive taste from tongue &	

3. Special somatic • **4 vestibular nucleus** • **2 cochlear nucleus** • Receive stimuli from **ear**	of 9th • Dorsal motor nucleus of 10^{th} (Vagus) **3. Special Visceral or Branchial component** • Innervate muscles derived from branchial arches i.e. • **Masticatory nucleus** **of 5th** • **Facial nucleus of 7th**

108. In a study to detect extracellular fluid volume, 10 gm mannitol was injected by intravenous route and after waiting for adequate time for equilibration of levels, concentration was measured as 50 mg/100 ml. In this time, 10% mannitol was excreted. What is the calculated volume of ECF?

a) 10 L

b) 18 L

c) 42 L

d) 52 L

Correct Answer - B

Ans: B. 18 L

- Out of 10 gm mannitol, 10% was excreted.
- Hence, amount of mannitol distributed in ECF = 10-1= 9 gm
- Given concentration of mannitol in ECF = 50 mg/100 ml
- Volume of ECF = Amount/Concentration = 9 g/50 mg x 100 ml = 18 L.

109. A 37-year-old patient presented to you with hyper-extension of 4th and 5th metacarpophalangeal joint with flexion at proximal interphalangeal joint. This deformity is due to injury to:

a) Deep branch of ulnar nerve

b) Median nerve

c) Radial nerve

d) Superficial branch of median nerve

Correct Answer - A
Ans: A. Deep branch of ulnar nerve
(Ref: Gray's 41/C p784, 866, 40/e p888)
Deformity = Claw hand.

- Due to injury of deep branch of ulnar nerve.

110. Which of the following nerves supplies the ear lobule?

a) Greater auricular nerve

b) Lesser occipital nerve

c) Facial nerve d

d) Auriculotemporal nerve

Correct Answer - A

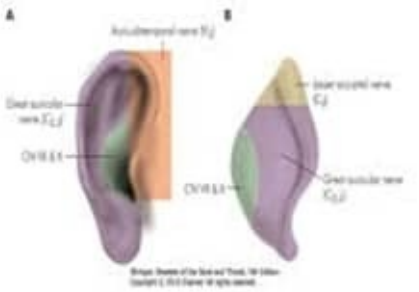
Ans:. A. Greater auricular nerve

(Ref Gray's 41/e p627, 40/e p620)

- Greater auricular nerve supplies ear lobule.

Sensory nerves of ear:

- **Great auricular nerve** - Supplies most of cranial surface & posterior part of lateral surface (helix, antihelix, lobule).
- **Lesser occipital nerve** - Supplies upper part of cranial surface.
- **Auricular branch of vagus** - Supplies concavity of concha & posterior part of eminentia.
- **Auriculotemporal nerve** - Supplies tragus, crus of helix & adjacent part of helix.
- **Facial nerve + auricular branch of vagus** - Supplies small areas on both aspects of auricle, concha depression & its eminence.



111. Which of the following structures are not involved in development of diaphragm?

a) Somatic body wall

b) Septum transversum

c) Pleuroperitoneal membrane

d) Pleuropericardial membrane

Correct Answer - D

Ans: D. Pleuropericardial membrane

Pleuropericardial membrane:

- Supradiaphragmatic structure.
- Not involved in formation of diaphragm.

Development of Diaphragm:

- Septum transversum - Central tendon.
- Pleuroperitoneal membranes → Small intermediate muscular portione.
- Mesentery of esophagus → Crurae.
- Body wall → Peripheral muscular diaphragm.
- Cervical myotomes (muscular input).

112. Which of these is an immune-privileged site?

a) Area postrema

b) Loop of Henle

c) Optic nerve

d) Seminiferous tubules

Correct Answer - D
Ans: D. Seminiferous tubules
Ref Grays 40/e p52; Robbins 9/e p214; Ganong 25/e p418, 24/e p420)
Seminiferous tubule of testis - Immune privileged site.
Immune privileged site:

- Hidden (sequestered) antigens formed only in where there is no communicate between blood & lymph.
- Hence, self-antigens in these tissues fail to elicit immune responses à Essentially ignored by immune system.

Immune- Privileged Sites

Testis°	**Placenta & fetus°**
Eye (Anterior camber)°	**Brain°**

113. Craniovertebral joint does not include:

a) Occipital condyle

b) Axis

c) Atlas

d) Wings of sphenoid

Correct Answer - D
Ans: D. Wings of sphenoid
(Ref Gray's 40/e p733)
Craniovertebral Joint:

- Consists of occipital condyles, atlas & axis.
- Articulation between cranium & vertebral column specialized – To provide a wider range of movement.
- Functions as a universal joint.
- Permits horizontal & vertical scanning movements of head.
- Adapted for eye-head co-ordination.

114. Maxillary bone does not articulate with:

a) Ethmoid

b) Sphenoid

c) Frontal

d) Lacrimal

Correct Answer - B
Ans: B. Sphenoid
(Ref Gray's 41/e p484, 40/e p473-476)
Maxillary bone does not articulate with sphenoid.
Articulation of maxilla:
Each **maxilla articulates with nine bones:**

- **Two of cranium: Frontal & ethmoid.**
- **Seven of the face: Nasal, zygomatic, lacrimal, inferior nasal concha, palatine, vomer & adjacent fused maxilla.**
- Sometimes articulates with orbital surface & with lateral pterygoid plate of sphenoid.

115. True statements about osteoblasts are all except:

a) Derived from osteoprogenitor cells

b) Regulated by BM P

c) Have a plasma membrane showing multiple folds

d) Have neuropeptide receptors

Correct Answer - C

Ans: C. Have a plasma membrane showing multiple folds

(Ref Gray's 40/e p87, 88, 91)

Characteristic of osteoclasts:

- Plasma membrane showing multiple folds.
- I.e. ruffled borders are involved in osteocytic resorption.

Osteoclasts:

- Large (40 or more) polymorphic cells.
- Have upto 20 oval, closely packed nuclei.
- Howship's lacunae - Lie in close contact with bone surface in resorption bays.

Cytoplasm:

- Contains numerous coated transport vesicles & microtubule arrays.
- Involved in vesicles transport between Golgi stacks & ruffled membrane.
- Ruffled membrane - Highly infolded cell surface of active osteoclasts at local bone resorption sites.

Osteoblasts:

- Derived from osteoprogenitor (stem) cells of mesenchymal origin.
- Present in bone marrow & other connective tissues.
- Proliferate & differentiate after stimulated by bone morphogenetic proteins (BMPs à into osteoblasts prior to bone formation.

116. Which of the following vessels supply the anal canal?

a) Superior rectal artery

b) Middle rectal artery

c) Inferior rectal artery

d) all of the following

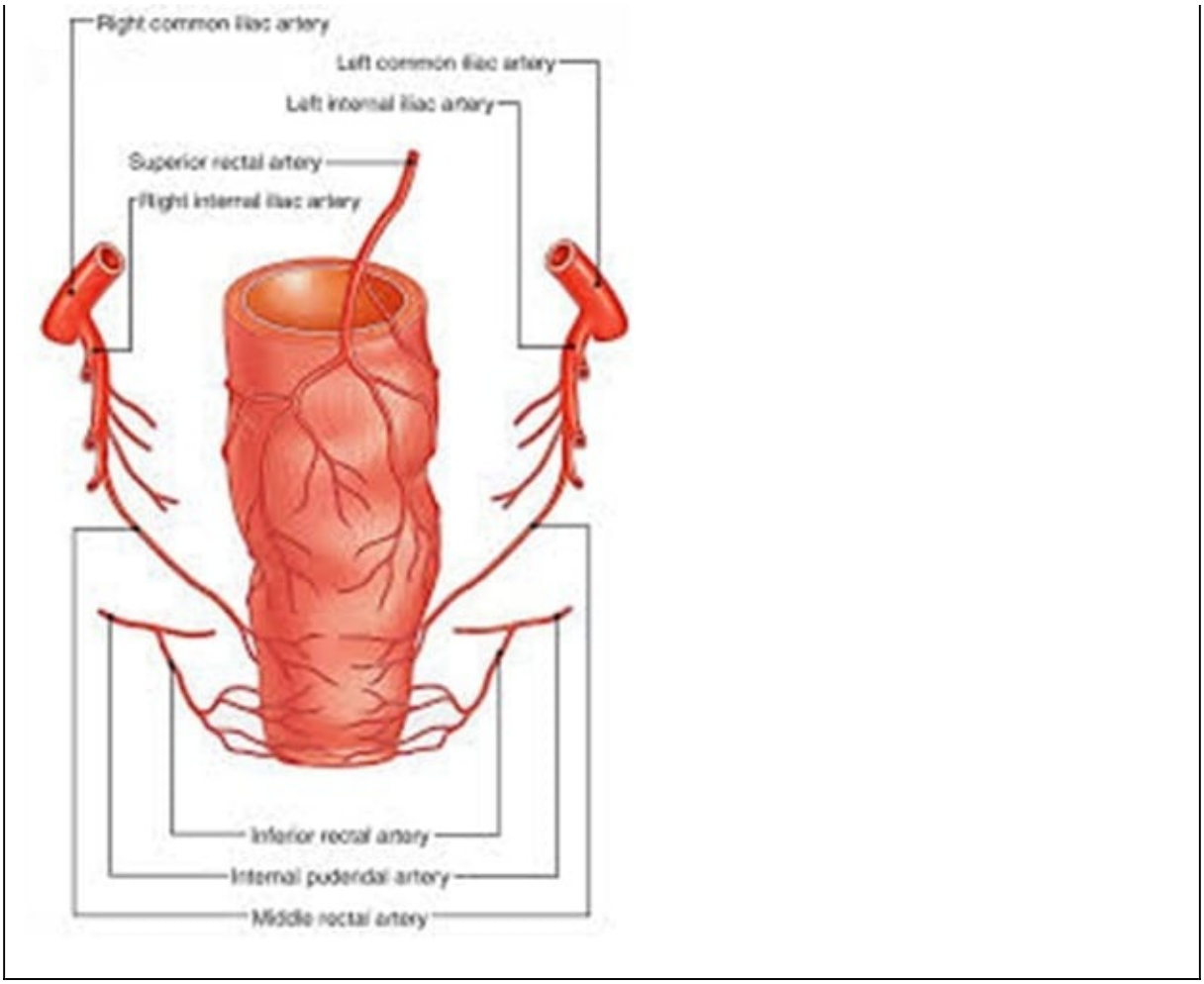
Correct Answer - D

Ans: D. all of the above arteries supply rectal canal

(Ref: Gray's 41/e p1058, 40/e p1155-1159; Manual of Total Mesorectal Excision by Moran, Richard John Heald (2013)/p40)

Anal canal – Supply:

- By superior rectal, middle rectal, inferior rectal branches of pudendal artery.
- Occasionally by median sacral artery.


Right common iliac artery
Left common iliac artery
Left internal iliac artery
Superior rectal artery
Right internal iliac artery
Inferior rectal artery
Internal pudendal artery
Middle rectal artery

117. Buccinator is pierced by all of the following except:

a) Labial branch of facial nerve

b) Buccal branch of mandibular nerve

c) Parotid duct

d) Molar mucous glands

Correct Answer - B

Ans: B. Buccal branch of mandibular nerve

(Ref Grays 41/e 4(Y 10/e p487; Snells 9/e p582)

- Buccal branch of facial run crosses the buccinator muscle and innervates it, without piercing it.

Buccinator - Structures passing:

- Anteriorly (Superficial buccinator surface):
- Muscles - zygomaticus major, risorius, levator & depressor anguli oris muscles.
- Duct - Parotid duct.
- Pierces buccinator opposite third upper molar tooth & lies on deep muscle surface before opening into mouth opposite maxillary second molar tooth.
- Blood vessel - Crossed by facial artery, facial vein & branches of facial & buccal nerves.

118. All of the following are true about location of otic ganglia except:

a) Inferior to foramen ovale

b) Lateral to tensor veli palatini

c) Lateral to mandibular nerve

d) Anterior to middle meningeal artery

Correct Answer - C

Ans: C. Lateral to mandibular nerve

(Ref Gray 41/e p552. 40/e p543)

Mandibular nerve lies lateral to otic ganglion.

Ie., Ganglion lies medial to mandibular nerve.

Otic ganglion:

- Small, oval, flat reddish-grey ganglion.
- Situated just below foramen ovate.
- Peripheral parasympathetic ganglion located in the infratemporal fosse.
- Functionally associated with glossopharyngeal nerve & innervates parotid gland for salivation.
- Connected to chorda tympani nerve & to nerve of pterygoid canal.
- Pathways provide an alternate pathway of taste from anterior two-thirds of tongue.

119. Most important blood supply to stomach:

a) Left gastric artery

b) Short gastric artery

c) Right gastro epiploic artery

d) Left gastro epiploic artery

Correct Answer - A
Answer- A (Left gastric artery)
The left gastric artery is the branch of celiac axis and is the largest artery supplying the stomach.
Stomach has rich blood supply arising from celiac trunk and its branches in the form of right and left gastric, right and left gastroepiploic and short gastric arteries.
Blood Supply of Stomach:

- Left gastric artery: Branch of celiac trunk (Largest)
- Right gastric artery: Branch of hepatic artery
- Right gastroepiploic artery: Branch of gastroduodenal artery
- Left gastroepiploic artery: Branch of splenic artery
- Short gastric arteries: Branch of splenic artery

120. In spermatogenesis, independent assortment of paternal and maternal chromosomes occurs during-

a) Primary to secondary spermatocyte

b) Spermatogonia to primary spermatocyte

c) Secondary spermatocyte to spermatids

d) Spermatids to spermatozoa

Correct Answer - A
Answer- A. Primary to secondary spermatocyte

- In spermatogenesis, independent assortment of paternal and maternal chromosomes occurs during meiosis I, in which primary spematocyte) to (2n) is converted into two secondary spermatocytes (In).

121. Buccopharyngeal membrane develops from:

a) Ectoderm + Mesoderm

b) Ectoderm + Endoderm

c) Mesoderm + Endoderm

d) Ectoderm + Mesoderm + Endoderm

Correct Answer - B
Answer- B. Ectoderm + Endoderm

- Buccopharyngeal and cloacal membrane are the regions where the ectoderm and underlying endoderm are opposed without intervening mesoblast.
- Over this area the ectoderm and endoderm come into direct contact with each other and constitute a thin membrane, the buccopharyngeal membrane.

122. Epithelioid cells include which of the following:

a) Islet cells of pancreas

b) Theca lutein cells

c) Cells of Brunner's gland

d) Interstitial cells of Leydig

Correct Answer - A:D
Answer- A. Islet cells of pancreas & D. Interstitial cells of Leydig

- Epithelioid cells include both islet cells of pancreas & interstitial cells of Leydig.
- Tissues that resemble epithelia but lack the characteristic free surface are designated as epithelioid tissue. They are in close contact, like epithetial cells of a true epithelium. This is the characteristic structure of the endocrine organs which develop from typical epithelia but lose their connection to a surface during development.

123. All of the following bones are involves in wrist joint formation; except:

a) Scaphoid

b) Ulna

c) Radius

d) Triquetral

Correct Answer - B

Ans. b. Ulna

Wrist Joint (Radiocarpal Joint)

- It is a synovial ellipsoid joint.
- It is formed by articulation of the distal end of the radius and the articular disc above and the scaphoid, lunate, and triquetral bones below.
- Ulna excluded from the wrist joint by the articular disc.

124. Which of the following cranial nerve not associated with olfaction?

a) XII

b) IX

c) V

d) X

Correct Answer - A

Ans. A. XII

- XII nerve is a motor nerve; does not play role in olfaction and gustation.

Cranial Nerves — Components and Functions

Number	Name		Function
I	Olfactory nerve		Smell sensation
II	Optic nerve		Vision
III	Oculomotor		Turns eyeball upward, downward, and medially; Raises upper eyelid, also constricts pupil; accommodates eye
IV	Trochlear nerve		It helps in turning eyeball downward and laterally
V	Trigeminal	Maxillary division	Supplies dura mater of anterior part of middle cranial fossa, conjunctiva of inferior eyelid, skin of face over maxilla;

		maxilla; teeth of upper jaw; mucous membrane
Number	**Name**	**Function**
	Ophthalmic division	Supplies cornea, superior conjunctiva, skin of dorsum of external nose, forehead, scalp, superior eyelids, and also mucous nasal cavity, ethmoid, frontal and sphenoid sinuses
	Mandibular division	Skin of lower lip, buccal, parotid and temporal regions of face, external ear (Auricle, tympanic membrane and acoustic meatus), mucous membrane of mouth and anterior two-third part of tongue. Supplies 4 muscles of mastication, mylohyoid, anterior belly of digastric, tensor tympani and tensor veli palatini
VI	Abducent	Lateral rectus muscle turns eyeball laterally

Number	**Name**	**Function**
VII	Facial	Taste from anterior two-thirds of tongue, from floor of mouth and palate Muscles of face and scalp, stapedius muscle, posterior belly of digastric and stylohyoid muscles Submandibular and sublingual

			salivary glands,the lacrimal gland, and glands of nose and palate
VIII	Vestibulocochlear	Cochlear	Organ of Corti—hearing
		Vestibular	From utricle and saccule and semicircular canals—position and movement of head
IX	Glossopharyngeal		General sensation and taste from posterior one-third of tongue and pharynx; carotid sinus (baroreceptor); and carotid body (chemoreceptor)

Number	**Name**		**Function**
			Stylopharyngeus muscle—assists swallowing
			Parasympathetic parotid salivary gland
X	Vagus		Heart and great thoracic blood vessels; larynx, trachea, bronchi, and lungs; alimentary tract from pharynx to splenic flexure of colon; liver, kidneys, and pancreas
XI	Spinal accessory	Cranial root	Sternocleidomastoid and trapezius muscles
		Cranial	Muscles of soft palate (except tensor veli palatini), pharynx (except stylopharyngeal), and larynx

		root	stylopharyngeus), and larynx (except cricothyroid) in branches of vagus
XII	Hypoglossal		Muscles of tongue (except palatoglossus) controlling its shape and movement

125. Ligamentum flavum consists of:

a) Type-II collagen

b) Type-III collagen

c) Reticulin

d) Elastin

Correct Answer - D

Ans. D. Elastin

- Ligamentum flavum connects the laminae of adjacent vertebrae.
- The ligamentum flavum has a high content of elastin. So under tension it can be stretched by 80% without damage.
- Functions of ligamentum flavum to provide a constant smooth lining to the vertebral canal, which is never overstretched in flexion and which never goes slack in extension.

126. Golgi apparatus in serous acinar cells is at:

a) Supranuclear

b) Apical

c) Adjacent to nucleus

d) Basal

Correct Answer - A

Ans. a. Supranuclear

- Serous cells have a pyramidal shape.
- They possess large amounts of rough endoplasmic reticulum (RER) with many ribosome free regions, supranuclear Golgi complex and numerous spherical secretory granules.

127. What is the location of Meissner's corpuscles?

a) Lucidum

b) Basale

c) Reticular dermis

d) Papillary dermis

Correct Answer - D
Ans. d. Papillary dermis

- Meissner corpuscles are encapsulated nerve endings present in dermal papillae.
- Merkel cells location: Stratum basale
- Pacinian corpuscle location: Reticular layer of dermis

128. Normally seen in lumbar spine?

a) Scoliosis

b) Lordosis

c) Kyphosis

d) Kyphosis

Correct Answer - B

Ans. B. Lordosis

Abnormal Curvatures of the Vertebral Column

Lordosis (swayback or saddle back)	An abnormally increased lumbar spine's (backward) curvature resulting from trunk muscular weakness or osteomalacia.
Scoliosis	A condition of lateral deviation resulting from unequal growth of the vertebral column, pathologic erosion of vertebral bodies, or asymmetric paralysis or weakness of vertebral muscles.
Kyphosis (hunchback or humpback)	An abnormally increased thoracic (forward) curvature resulting from osteoporosis.
Meningocele	It is a protrusion of the meninges through the unfused arch of the vertebra.
Spina bifida occulta	It is failure of the vertebral arch to fuse (bony defect only).
Meningomyelocele	It is a protrusion of the spinal cord and the meninges.

129. All of the following are true about grey communicans except:

a) U nmyel inated

b) Connects to spinal nerves

c) Pregang I ion ic

d) Present medial to the white ramus cornmunicans

Correct Answer - C
Ans. c. Preganglionic

- Each spinal nerve receives a branch called a gray ramus communicans from the adjacent paravertebral ganglion of the sympathetic trunk. The gray rami communicans contain postganglionic nerve fibers of the sympathetic nervous system and are composed of largely unmyelinated neurons. This is in contrast to the white rami communicans, in which heavily myelinated neurons give the rami their white appearance.
- "The gray ramus communicans connects the sympathetic trunk or a ganglion to the anterior ramus and contains the postganglionic sympathetic fibers. It appears gray because postganglionic fibers are nonmyelinated. The gray ramus communicans is positioned medial to the white ramus communicans."

130. Parasympathetic nervous system comprises of:

a) Cranial nerves lll, V Vil, X and sacral nerves Sl, s2, s3. s4, s5

b) Cranial nerves III, VII, IX, X and sacral nerves s2, S3, S4

c) Cranial nerves V, VII, IX, X and sacral nerves S2, S3, S4

d) Cranial nerves III, V VII, X and sacral nerves S2, S3, S4

Correct Answer - B

Ans: B. Cranial nerves III, VII, IX, X and sacral nerves s2, S3, S4

(Ref Grayls40/ep235;Ganong25/ep257,24/ep2571

- Parasympatheticflow is cranio-sacral, carried by cranial nemes III, VII, X, X & sacral nerves S2, S3, S4.

131. Extra-embryonic mesoderm is derived from:

a) Epiblast

b) Primary yolk sac

c) Secondary yolk sac

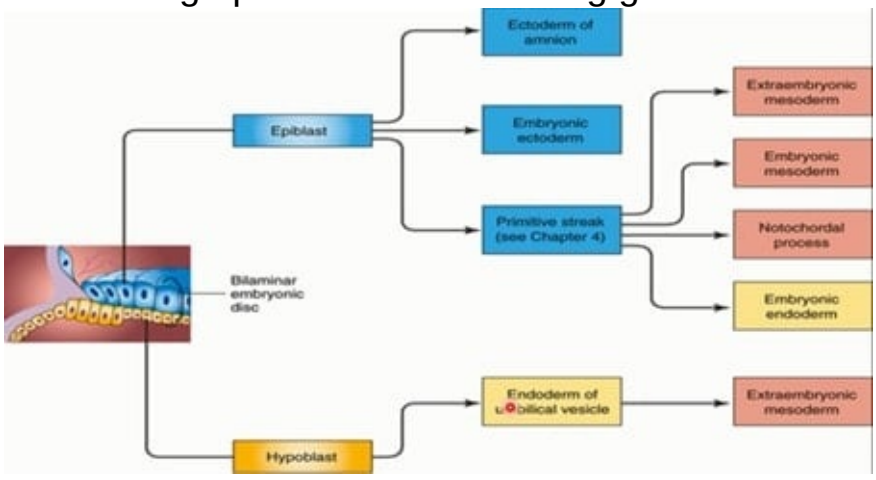
d) Hypoblast

Correct Answer - B

Ans: B. Primary yolk sac

(Ref Gray's. 41/e p169, 40/e p167, 173, 186-189; Langmuir S 13/e p45,'Pe p54-55)

- Extra-embryonic mesoderm is derived from primary yolk sac.
- Formed by delamination of yolk sae cells → later by migration of cells through primitive streak during gastrulation.



132. Anterior two third of the tongue is demarcated from the posterior one third by: plexus, 2-long thoracic plexus, 2-long thoracic

a) Passavant's ridge

b) Sulcus terminalis

c) Circurnvallatepapillae

d) Filifonn papilla

Correct Answer - B

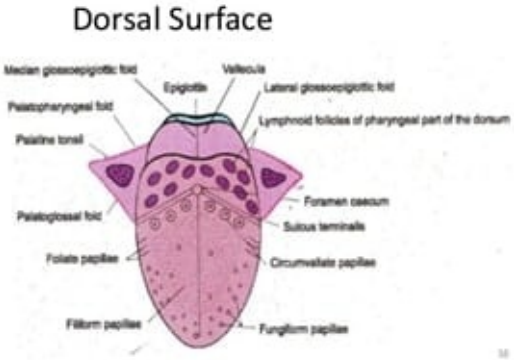
Ans: B. Sulcus terminalis

(Ref Gray's 41/e p5 I I, 40/e p503)

- Anterior two third of the tongue is demarcated from the posterior one-third by sulcus terminalis.

Tongue:

- Divided by a V-shaped sulcus terminalis.
- Further divides tongue into,
- Anterior, oral (presulcal) part facing upwards.
- Posterior, pharyngeal (postsulcal) part facing posteriorly.
- Anterior part forms about two-thirds of tongue length.



133. All of the following structures lie in the relation to the left ureter except:

a) Mesentery of sigmoid colon

b) Bifurcation of common iliac artery

c) Quadratus lumborum

d) Gonadal vessels

Correct Answer - C

Ans: C. Quadratus lumborum

*(*Ref Grays 41/e p1251, 40/e p1239)

- Left ureter is related posteriorly to psoas major muscle (not quadratus lumborum).
- Relations of Right Ureter

Anterior:

- Duodenum,
- Terminal part of the ileum,
- Right colic vessels,
- Iliocolic vessels,
- Right testicular or ovarian vessels, and the
- Root of the mesentery.

Posterior:

- Right psoas muscle,
- Bifurcation of the right common iliac artery
- Relations of Left Ureter

Anterior:

- Sigmoid colon,
- Sigmoid mesocolon,
- Left colic vessels,
- Left testicular or ovarian vessels

Posterior:

- Left psoas muscle,
- Bifurcation of left common iliac artery

134. All of the following muscles have parallel oriented fibers except:

a) Sartorius

b) Rectus abdominis

c) Sternohyoid

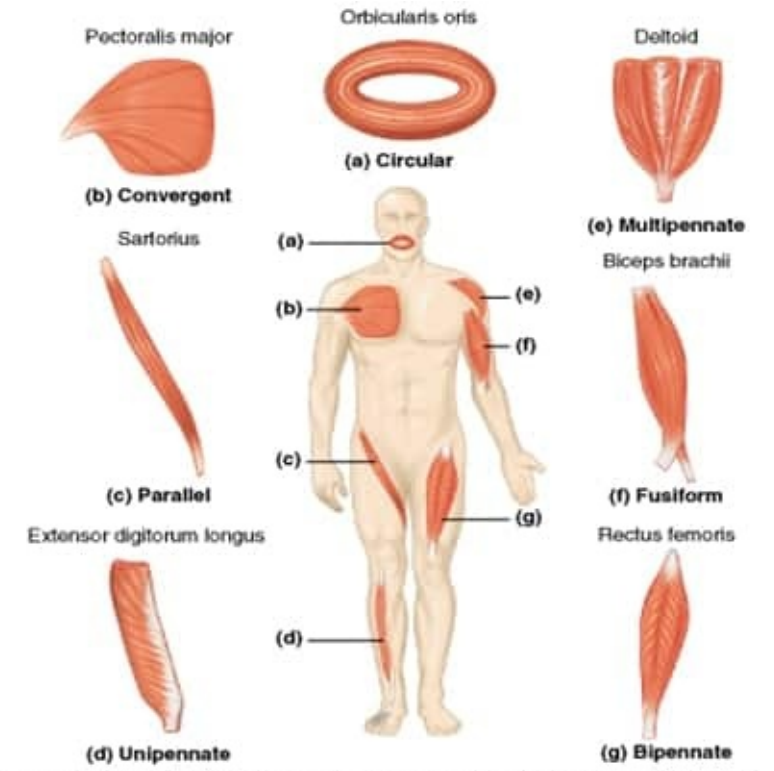
d) Tibialis anterior

Correct Answer - D

Ans: D. Tibialis anterior

(Ref Gray's. 41/e p112, 40/e p104-105).

- Individual fibers of muscle are arranged either parallel or oblique to long axis of the muscle.
- **Sartorius, rectus abdominis & sternohyoid - Parallel oriented fibers.**
- **Tibialis anterior muscle - Multipennate muscle with oblique fibers.**



Muscles with Parallel Fasciculi

- Muscles in which fasciculi are parallel to the line of pull & have greater degree of movement.

Types:

- Quadrilateral: Thyrohyoid
- Strap-like: Sternohyoid & sartorius
- Strap-like with tendinous intersections:
- Rectus Abdominis
- Fusiform: Biceps brachii, digastric

Muscles with Oblique Fasciculi

- Muscles in which fasciculi are oblique to the line of
- pull, muscle may be triangular, or pennate (feather? like) in the construction
- Arrangement makes muscle more powerful.
- Reduces range of movement.

Types:

- **Triangular: Temporalis, adductor longus°**
- Unipennate: Flexor pollicis longus, extensor **digitorum longus°**
- **Bipennate: Rectus femoris, flexor hallucis longus°**
- **Multipennate: Tibialis**

anterior, submscapularis, deltoid (acromial fibers).

135. What is the nerve supply of the angle of the jaw?

a) Mandibular nerve

b) Maxillary nerve

c) Lesser occipital nerve

d) Greater auricular nerve

Correct Answer - D

Ans: D. Greater auricular nerve

(Ref: Gray's 41Ie p407, 413, 40Ie p435)

The skin over the angle of mandible is supplied by the greater auricular nerve, which carries branches from anterior ramus of C2 and C3.

Branches of Upper Cervical Spinal Nerves

Great auricular nerve	Branches from anterior rami of 2" & 3rd cervical spinal nerves° Innervates skin over the angle of mandible, parotid gland & earlobe°
Lesser occipital nerve	Branches from anterior rami of 2" & 3rd cervical spinal nerves° Innervates scalp behind the ear°.
Greater occipital nerve	Branching off the posterior ramus of the 2" cervical spinal nerves° Innervates scalp of occipital area°
3rd occipital nerve:	Branches off the posterior ramus of 3rd cervical nerve° Innervates scalp in occipital & sub occipital areas°.

136. All of the following are true about venous drainage of esophagus except:

a) Thoracic esophagus drains into the azygos vein

b) Esophageal veins drain into a submucosal plexus

c) The cervical esophagus drains directly into the right brachiocephalic vein

d) Lower esophageal veins anastomose with the left gastric vein

Correct Answer - C

Ans: C. The cervical esophagus drains directly into the right brachiocephalic vein

(Ref: Gray's 411e p1111, 40Ie p950).

- Cervical part of esophagus is drained into inferior thyroid vein, not the right brachiocephalic vein.

Venous drainage of esophagus:

- Cervical part is drained by inferior thyroid vein.
- Thoracic part is drained by azygous and hemiazygous veins.
- Abdominal part is drained by two venous channels, hemiazygous vein and left gastric vein.

137. Type I collagen is present in all except

a) Bone

b) Cartilage

c) Ligament

d) Aponeurosis

Correct Answer - B
Ans. b. Cartilage
Cartilage contains type II collagen.
Type I collagen Bone, skin, dentin, cornea, tendons, ligaments
Type II collagen Cartilagenous tissue
Type III collagen Blood vessel, internal organs
Type IV collagen Basement membrane
There are at least 19 types of collagen in all, but these Type I to IV are most commonly found.
Ref: Ross & Pawlina, 7th ed., Histologt A Text and Atlas, pg. 160-167 and Junqueira's Basic Histologt, 13th ed, pg. 106-108

138. Compartment of leg without neurovascular bundle?

a) Anterior

b) Lateral

c) Deep posterior

d) Superficial posterior

Correct Answer - D
Ans. d. Superficial posterior
Ref: Grays Anatomy, 4lst ed, pg- 1406-1412 and Last anatomy 12th ed, pg. 142
Contents of flexor (posterior) compartment:
Superficial part:

- Gastrocnemius, plantaris and soleus muscles

Deep part:
Popliteus, Flexor digitorum longus, flexor hallucis longus and Tibialis posterior muscle
Posterior tibial and peroneal vessels
Tibial nerve

139. Spinal cord ends at what level in adults?

a) T12

b) L1

c) L2

d) L3

Correct Answer - B
Ans. b. L1
Ref: Grays Anatomy, 4l" ed., pg. 762-763

- In the adult, the spinal cord terminates on average at the level of the middle third of the body of the first lumbar vertebra which corresponds approximately to the transpyloric plane.
- Spinal cord extends from C I to L I (lower border) in adults.
- Filum terminale extends from lower end of spinal cord to the tip of coccyx.
- Dural sheath extends up to 52 vertebrae.
- Subdural space extends up to 52.
- Subarachnoid space extends up to 52.
- Piamater extends up to tip of coccyx.

140. Inferiorthyroid artery is a branch ol?

a) Thyrocervical trunk

b) ICA

c) Costocervical trunk

d) ECA

Correct Answer - A
Ans. A. Thyrocervical trunk
Ref: Grays Anatomy,4Ia ed., pg. 455458

- Inferior thyroid artery is branch of thyrocervical trunk of subclavian artery.
- The thyrocervical trunk arises fiom the front of the first part of the subclavian artery near the medial border of scalenus anterior, and divides into the inferior thyroid, suprascapular and superficial cervical arteries.

141. Which of the following sensation is not perceived by spinal nucleus of trigeminal nerve?

a) Pain

b) Touch

c) Temperature

d) Proprioception

Correct Answer - D

Ans. D. Proprioception

Ref: Barr's the haman nervons system, I0'h ed., pg. 127 & Snell's neurounatomy 7't'ed., pg. 342-343

- The trigeminal nerve is the largest cranial nerve and contains both sensory and motor fibres.
- Sensory nerve to greater part of the head.
- Motor nerve to several muscles, including the muscles of mastication.
- The trigeminal nerve has four nuclei:
- (1) the main sensory nucleus, (2) the spinal nucleus, (3) the mesencephalic nucleus, and (4) the motor nucleus.
- Proprioceptive impulses from the muscles of mastication and from the facial and extraocular muscles are carried by fibres in the sensory root of the trigeminal nerve that have bypassed the semilunar or trigeminal ganglion.
- The fibres cells of origin are the unipolar cells of the mesencephalic nucleus.

142. Purkinje fibers relay to which of the following?

a) Dentate nucleus

b) Caudate nucleus

c) Amygdala

d) VLN thalamus

Correct Answer - A

Ans. A. Dentate nucleus

Ref: Barr's human nervous system 10th ed., pg. 164 and Snell's neuroanatomy, 7 e4, W.235

- The cerebellum is composed of an outer covering of gray matter called the cortex and inner white matter.
- There is a large amount of white matter in each cerebellar hernisphere.
- The efferent fibres constitute the output of the cerebellum and commence as the axons of the Purkinje cells of the cerebellar cortex.
- The great majorify of the Purkinje cell axons pass to and synapse with the neurons of the cerebellar nuclei (f'astigial, globose, embolifbrm, and dentate).

143. Which of the following is false regarding blood supply of dura mater?

a) Meningeal branch of ICA in posterior cranial tbssa

b) Accessory meningeal artery

c) Meningeal branch of anterior and posterior ethmoidal artery

d) Middle meningeal artery

Correct Answer - C

Ans. C. Meningeal branch of anterior and posterior ethmoidal artery

Ref Grays Anatomy, 41" ed., pg. 439 und Snell's neuroanatomy, Vt'ed., pg. 175-477

Anterior cranial fossa:

- Anterior rneningeal branches of the anterior and posterior ethmoidal and internal carotid arleries and a branch of the nriddle meningeal artery.

Middle cranial fossa:

- Middle and accessory meningeal branches of the maxillary artery, a branch of the ascending pharyngeal artery (entering via the tbrarnen lacerum), branches of the internal carotid and a recurrent branch of the lacrimal artery.

Posterior fossa:

- Meningeal branches of the occipital artery, posterior meningeal branches of vertebral artery, occasional small branches of the ascending pharyngeal artery, hypoglossal canal & dorsal meningeal and tentorial arteries arising from the meningohypophysial trunk.

144. Which of the following is true about nerve supply of adrenal gland?

a) Release of catecholamines is not affected by nerve supply to adrenals

b) Preganglionic fibres from lower thoracic and lumbar vertebra come via sympathetic chain to supply adrenals

c) Adrenal cortex doesn't have nerve supply as it has endocrine functions

d) Adrenal medulla doesn't have nerve supply

Correct Answer - B

Ans. B. Preganglionic fibres from lower thoracic and lumbar vertebra come via sympathetic chain to supply adrenals

Ref: Grays Anatomy, 41" ed., pS. 439

- Suprarenal gland - Greater autonomic supply than any other organ.
- The nerves are distributed throughout the gland around blood vessels (regulating blood flow), in the medulla (stimulating the release of catecholamines from chromaffin cells), and in the cortex (where they may influence steroid hormone production).
- A suprarenal plexus lies between the medial aspect ofeach gland and the coeliac and aorticorenal ganglia.
- It contains predominantly preganglionic syrnpathetic fibres that originate in the lower thoracic spinal segments, reach the plexus via branches of the greater splanchnic newes, and synapse on clusters of large medullary chromaffin cells.

145. Finger with two dorsal interossei attached?

a) Little

b) Index

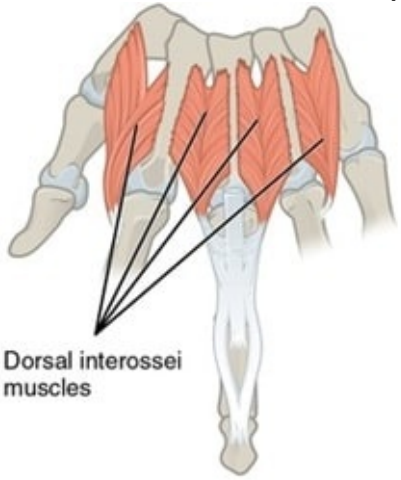
c) Middle

d) Ring

Correct Answer - C

Ans.C. Middle

- 1st: largest; lateral side of index finger
- 2nd and 3rd: both attach to either side of 3rd (middle) finger
- 4th: medial side of 4th (ring) finger



146. Arrange the following in sequence from Lateral to medial

a) Inferior colliculus

b) Medial geniculate body

c) Cochlear nucleus

d) Lateral lemniscus

Correct Answer -
Answer: c->d->a->b
Auditory pathway: (mnemonic) **SC-SLIM-41,42**

- **S**- Spiral ganglia (cochlea)
- **C**- Cochlear nuclei (ponto-medullary junction)
- **S**-Superior olivary nucleus (pons)
- **L**-Lateral lemniscus (brain stem)
- **I**-Inferior colliculus (mid-brain)
- **M**-Medial geniculate body (meta-thalamus)
- 41,42 – Brodmann area (cerebral cortex)

147. Which is not a branch of the external carotid artery supplying nasal septum?

a) Sphenopalatine

b) greater palatine

c) superior labial

d) anterior ethmoidal

Correct Answer - D

Ans. D. anterior ethmoidal

The nasal septum also derives its blood supply from :

- Branches from the external carotid artery are the sphenopalatine artery, the greater palatine artery, the superior labial artery, and the angular artery.
- The main branches from the interior carotid are the anterior ethmoidal artery, and the posterior ethmoidal artery that supplies the septum, and these derive from the ophthalmic artery.

148. Mark true or false among the following:
Content 's of Carotid Sheath are
A. Internal jugular vein
i) true
ii) false
B. Cervical sympathetic trunk
i) true
ii) false
C. Vagus nerve
i) true
ii) false
D. Internal carotid artery
i) true
ii) false
E. Deep cervical lymph nodes
i) true
ii) false

a) **A. ii) B. ii) C. i) D. i) E. i)**

b) **A. i) B. ii) C. ii) D. i) E. i)**

c) **A. i) B. ii) C. i) D. i) E. ii)**

d) **A. i) B. ii) C. i) D. i) E. i)**

Correct Answer - D

Ans. D: A. i) B. ii) C. i) D. i) E. i)

The carotid sheath also is a tubular fascial investment that extends superiorly between the cranial base and inferiorly to the root of the neck. The carotid sheath contains the common and internal carotid arteries, internal jugular vein, and vagus nerve [cranial nerve (CN) X]. In addition, the carotid sheath contains deep cervical lymph nodes, sympathetic fibers, and the carotid sinus nerve. The cervical sympathetic trunk lies behind the sheath but is not included within it.

149. True about Levator Ani except -

a) Converge downwards & medially

b) Supports viscera

c) Made up of iliococcygeus & pubococcygeus

d) Attached to pelvic brim

Correct Answer - D

Ans. D. Attached to pelvic brim

The levator ani is made up of three parts:

- **Iliococcygeus muscle**
- **Pubococcygeus muscle**
- **Puborectalis muscle**

Origin & Insertion:

- The levator ani arises, in front, from the posterior surface of the superior pubic ramus lateral to the symphysis behind, from the inner surface of the spine of the ischium and between these two points, from the obturator fascia.
- The fibers pass downward and backward to the middle line of the floor of the pelvis
- The most posterior are inserted into the side of the last two segments of the coccyx; those placed more anteriorly unite with the muscle of the opposite side, in a median fibrous ridge called the anococcygeal body or raphe, which extends between the coccyx and the margin of the anus.

Action: Supports the viscera in pelvic cavity

150. Couinaud classified liver into 8 segments,which structure differentiates the segments anatomically

a) Portal vein

b) Hepatic vein

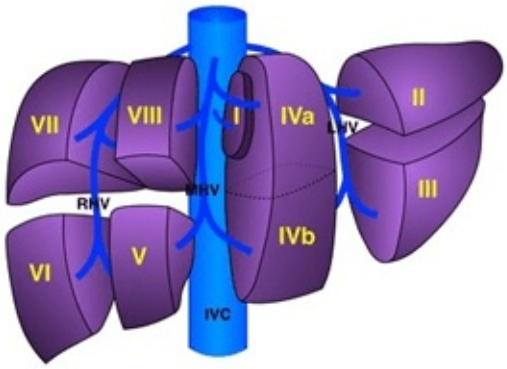
c) Bile duct

d) Hepatic artery

Correct Answer - B

Ans. B. Hepatic vein

- The Couinaud classification divides the liver into 8 functional segments.
- The hepatic veins are found at the periphery of each segment, whereas the center has branches of the portal veins, hepatic arteries, and bile ducts.
- The middle hepatic vein divides the liver into left and right lobes. The left hepatic vein divides the left lobe into lateral (2, 3) and medial (4a, 4b) segments. The right hepatic vein divides the right lobe into anterior (5, 8) and posterior (6, 7) segments. The caudate lobe (1) has hepatic veins that often drain directly into the IVC.


VII
VIII
I
IVa
II
LHV
MHV
III
RHV
IVb
VI
V
IVC

151. Assertion - Distal pole of scaphoid goes to avascular necrosis after scaphoid fracture.
Reason- Blood supply of scaphoid is from distal to proximal.

a) Assertion is true but reason is false

b) Both assertion reason are true and reason explains assertion

c) Both assertion and reason are false

d) Reason is true but assertion is false

Correct Answer - D

Ans. D. Reason is true but assertion is false

- The main blood supply to the scaphoid enters through the non-articular dorsal ridge at the waist of the bone and the volar tubercle at the distal aspect of the bone.
- A dorsal branch of the radial artery accounts for 80% of the blood supply of the scaphoid.
- A separate volar arterial branch to the scaphoid enters the tubercle and accounts for 20–30% of the scaphoid's blood supply, mainly to the distal portion.
- The proximal pole of the scaphoid relies entirely on intramedullary blood flow.
- The unusual retrograde nature of the scaphoid's blood supply renders it especially prone to non-union and proximal pole avascular necrosis

152. Golgi tendon organs used to detect ?

a) Dynamic

b) Static

c) Tension of muscle

d) All

Correct Answer - C
Ans. C. Tension of muscle
The **Golgi tendon organ** (GTO) (also called **Golgi organ**, **tendon organ**, neurotendinous **organ** or neurotendinous spindle) is a proprioceptive sensory receptor **organ** that senses changes in muscle tension. It lies at the origins and insertion of skeletal muscle fibers into the **tendons** of skeletal muscle.

153. False about innervation of parotid gland:

a) Postganglionic parasympathetic fibre secretomotor

b) Preganglionic parasympathetic fibre relay in Otic ganglion

c) Preganglionic parasympathetic nerve begin in inferior petrosal nucleus

d) Sympathetic nerve are vasomotor

Correct Answer - C

Ans. C. Preganglionic parasympathetic nerve begin in inferior petrosal nucleus

Nerve supply:

- **PARASYMPATHETIC:auriculo temporal nerve**
- **SYMPATHETIC SUPPLY-** plexus around the external carotid artery.
- **SENSORY NERVES: auriculotemporal nerve**, except for parotid fascia & overlying skin which are innervated by **Great auricular nerve (C2, C3).**

154. Arrange the following layers of epidermis from surface to deep layer -
Corneocytes
Merkel cells
Melanocytes
Langerhans cells

a) Corneocytes>merkel cell>melanocytes>langerhans cells

b) Merkel cells>corneocytes>melanocytes>langerhans cells

c) Melanocytes >merkel cells>corneocytes>langerhans cells

d) corneocytes>>langerhans cells>melanocytes > merkel cells

Correct Answer - D
Ans. D
The epidermis is composed of 4 or 5 layers, depending on the region of skin being considered.Those layers in descending order are:

- Cornified layer (stratum corneum)
  - Composed of 10 to 30 layers of polyhedral, anucleated corneocytes (final step of keratinocyte differentiation), with the palms and soles having the most layers.
- Clear/translucent layer (stratum lucidum, only in palms and soles)
  - This narrow layer is found only on the palms and soles. The epidermis of these two areas is known as "thick skin" because with this extra layer, the skin has 5 epidermal layers instead of 4
- Granular layer (stratum granulosum)
  - Keratinocytes lose their nuclei and their cytoplasm appears granular. Lipids, contained into those keratinocytes within lamellar bodies, are

released into the extracellular space through exocytosis to form a lipid barrier. Those polar lipids are then converted into non-polar lipids and arranged parallel to the cell surface.

- Spinous layer (stratum spinosum)
  - Keratinocytes become connected through desmosomes and start produce lamellar bodies, from within the Golgi, enriched in polar lipids, glycosphingolipids, free sterols, phospholipids and catabolic enzymes.
  - Langerhans cells, immunologically active cells, are located in the middle of this layer.
- Basal/germinal layer (stratum basale/germinativum).
  - Composed mainly of proliferating and non-proliferating keratinocytes, attached to the basement membrane by hemidesmosomes.
  - Melanocytes are present, connected to numerous keratinocytes in this and other strata through dendrites.
  - Merkel cells are also found in the stratum basale with large numbers in touch-sensitive sites such as the fingertips and lips.

155.

Which part of brachial plexus do not give branches

a) Root

b) Division

c) Cord

d) Trunk

Correct Answer - B
Answer: B. Division
Division does not give branches