**Question 1**

The diameter of a motor nerve fiber is?

A 20-50 micrometers

B 12-20 micrometres

C 10 millimetres

D 5-7 millimetres

Explanation (B)

A nerve fibre consists of an axon, its neurolemma (i.e. Schwann cells with or without myelin), and surrounding endoneurial connective tissue Fibers are of differering size, with larger myelinated fibres conducting faster than smaller unmyelinated fibers.

Fibre types:

Myelinated:

Aα - somatic motor and proprioception, diameter 16µm, speed 100m/s Aß - touch, diameter 8µm, and speed 50m/s

Ay - motor to muscle spindles, diameter 4µm, speed 25m/s

Aδ - pain and temperature (fast pain or epicritic pain), diameter 4µm, speed 25m/s

B - preganglionic autonomic, diameter 2µm, speed ~12.5m/s

Unmyelinated:

C - pain and temperature (slow pain or protopathic pain), postganglionic sympathetic diameter 1µm, speed 2m/s

MEMORY AID: Aα is 16µm and 100m/s, and each successive fibre is approx half the diameter and half the speed of the one before it (other than Ay and Aδ which are the same). C fibres are unmyelinated and thus very slow ("C" for slow).

**Question 2**

With respect to dermatomal nerve supply, which of the following is correct?

A T6 lies at level of the nipple

B C7 supplies the index finger

C The umbilicus is supplied by T12

D The anterior axial line divides C6 and C7

Explanation (B)

The umbilicus is supplied by T10. The line of junction of two dermatomes supplied from discontinuous spinal levels is demarcated by an axial line. T4 lies at the level of the nipple

Extra:

Dermatomes have created some problems in the past. Anatomy TB don’t seem to always agree

Old prescribed TB: C7-middle fingers

New prescribed TB: C7-middle and ring fingers (or middle three fingers)and centre posterior aspect of the forearm.

The picture: Palmer aspect C7-middle and ring finger. Dorsum aspect C7-middle finger nad half of the index and ring fingers

C6-lateral forearm and thumb. Picture, palmer-thumb, dorsum-thumb and half of the index finger

**Question 3**

Regarding myotomal supply, which of the following is correct?

A Opponens pollicis - C7/C8

B Shoulder abduction - C5/6

C Plantar flexion - L4/5

D Elbow extension - C6/C7

Explanation (D)

Plantar flexion is S1/S2.

Shoulder abduction is C5.

Opponens policis is T1-mainly with a small C8 component

Please note that in the current prescribed textbook it is C6/C7 for elbow extension. However, in previous text books used for the primary, elbow extension is shown as C7/C8

**Question 4**

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

A In the pons

B In the cerebral cortex

C In the hypothalamus

D Posterior to the cerebral aqueduct

Explanation (A)

The trigeminal nerve is the largest cranial nerve. The sensory root rises in the trigeminal (semilunar) ganglion that is at the apex of the petrous temporal bone. The motor neurons arrise in the upper pons. First 4 cranial nerve nuclei lie above the pons, second 4 lie in the pons, last 4 lie below the pons.

**Question 5**

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

A Pons

B midbrain

C hypothalamus

D floor of third ventricle

Explanation (A)

The motor part of the facial nerve arises from the facial nerve nucleus in the pons while the sensory part arises from the nervus intermedius which emerges between the pons and the inferior cerebellar peduncle, near the vestibulocochlear nerve

**Question 6**

Which of the following is a direct connection from the vestibular nucleus?

A Oculomotor nerve

B Vestibulospinal tract

C Medial geniculate body

D Medial longitudinal fasciculus

Explanation (B)

The vestibulospinal tract is one of the descending spinal tracts of the ventromedial pathway. It originates from thevestibular nerve of the medulla, which conducts information from thevestibular labyrinth in the inner ear. Motion of fluid in the vestibular labyrinth activates hair cells that signal the vestibular labyrinth via the cranial nerve VIII

Question 7

Regarding myotomes, which of the following statements is correct?

A A myotome is a muscle supplied by single peripheral nerve

B Shoulder adduction is C5

C Foot inversion is L4, L5

D Knee is flexion is L3,4

Explanation (C)

The unilateral muscle mass receiving innervation from fibres conveyed by a single spinal nerve (from the anterior ramus division) is a myotome. Knee flexion is L5, S1. Shoulder adduction and medial rotation is C6, C7, C8

**Question 8**

The myotome of the great toe extension is

A S1

B S2

C L4

D L5

Explanation (D)

L4: tibialis anterior and posterior and inversion of the foot

L5: extensor hallucis longus and extension of the great toe

S1: gastrocnemius, plantarflexion of the foot, ankle jerk

S2: small muscles of the foot

Note: this appears to be an old question. In the current textbook- it appears that either L5, S1 or both myotomes are involved. The older textbook was more specific and reported L5 as the myotome. Internet sources also prefer L5

**Question 9**

Which movement of the upper limb does not involve C6?

A Wrist extension

B Supination

C Pronation

D Shoulder adduction

Explanation (C)

Pronation is C7, C8.

Supination = C6

Shoulder adduction and medial rotation C6, C7, C8.

Wrist flexion = C7

Note: Old textbook write: wrist extension is C6C7 and wrist flexion C6C7. The current textbook writes : wrist extension C6 and Wrist flexion C7

**Question 10**

In which ganglion do the cell bodies of afferent taste fibres from the anterior tongue lie?

A Trigeminal

B Genicular

C Submandibular

D Otic

Explanation (B)

The sensory supply of the mucous membrane of the tongue (anterior 2/3) is by the lingual nerve, whose trigeminal component mediates common sensibility and whose chorda tympani components mediate taste. The cell bodies lie in the genicular ganglion of the facial nerve

**Question 11**

Which is the correct myotome for elbow extension?

A C5/6

B C5/C6/C7

C C7/C8

D C6/7

Explanation (D)

Using the current textbook

C5/6= elbow flexion

C6= elbow extension, wrist extension, supination, arm adduction, medial rotation of the arm

C7=is incorporated into many myotomes/actions (medial rotation of elbow, adduction of arm, arm extension, elbow extension hand flexion, pronation, digital extension and flexion)

C5/C6/C7= do not occur together

C7/C8 = digital flexion and extension and pronation of the hand

Note: in different textbooks, elbow extension isC7C8

**Question 12**

Regarding dermatomes which of the following statements is correct?

A A dermatome is separated from a discontinuous segment of the spinal cord by an axial line Correct Answer

B A dermatome is the area of skin and muscle supplied by a single spinal nerve

C They do not overlap in the chest

D They overlap at axial lines

Explanation (A)

They overlap considerably on the trunk and the limbs except at axial lines.

**Question 13**

Which of the following dermatomes supplies the little toe?

A L4

B S1

C L5

D S2

Explanation (B)

L3= anterior and medial thigh and knee

L4= medial leg, medial ankle and side of foot

L5= lateral leg, dorsum of foot, medial sole, 1-3 toes

S1= lateral ankle, lateral side of dorsum and sole of foot, 4-5 toes

S2= Posterior leg, posterior thigh, buttocks and penis

Note: current sources say S1= 5th toe only, S3=penis and bulk of buttocks, S4=scrotum, and small medial part of buttocks (close to rectum)

**Question 14**

Which of the following is the myotome responsible for knee extension?

A L3,4

B L5,S1

C L2,3

D L4,5

Explanation (A)

L2, L3= Hip flexion

L5, S1=Knee flexion

L4, L5=Ankle dorsiflexion

L3, L4=Knee extension

**Question 15**

A Horner's Syndrome can result from interruption of all of the following tracts/areas except?

A Superior cervical ganglion

B Cavernous sinus

C Lateral horn cells inT1 segmant of the cord

D Post-ganglionic fibres entering the sympathetic cord

Explanation (D)

The sympathetic path to the pupil is very long. From cells in the hypothalamus, fibres run down through the brain stem and spinal cord to the lateral horn cells in the T1 segment of the cord. Preganglionic fibres enter the sympathetic trunk via the white rami communicantes of the T1 nerve and pass up to the superior cervical ganglion. From there the postganglionic fibres accompany the internal carotid artery into the skull and cavernous sinus, leaving the artery to join the opthalic nerve and become distributed to the eye by the nasocilliary and the long ciliary branches. Damage to the above fibres can interrupt this pathway. Thus vascular lesons of the cortex or brainstem and damage to the sympathetic trunk by a cervical rib, carcinoma of the lung, thyroid or oesophagus may give rise to Horner's syndrome.

**Question 16**

Which of the following nerves is a branch of the medial cord of the brachial plexus?

A Lower subscapular

B Lateral pectoral

C Medial pectoral

D Dorsal scapular

Explanation (C)

The lateral pectoral nerve is a branch of the lateral cord. The dorsal scapular nerve (which supplies the rhomboids and levator scapulae) belongs to the C5 root. The lower subscapular nerve is a branch of the posterior cord. The medial pectoral nerve arises from the medial cord C8 T1 behind the first part of the axillary artery.

**Question 17**

Regarding the Brachial plexus, which of the following statements is incorrect?

A Cords enter the axilla above the first part of the axillary artery

B Cords embrace the 2nd part of the axillary artery

C Divisions form behind the clavicle and enter the anterior triangle

D Branches of the cords surround the third part of axillary artery

Explanation (C)

The divisions (anterior and posterior) are formed behind the clavicle and form the lateral, medial and posterior cords before entering the axilla. Thus the divisions do not enter the axilla. Divisions form behind the clavicle and enter the axilla as they form the cords of the brachial plexus

Another source: Divisions are formed by the trunks diving into anterior and posterior divisions, are located deep to the clavicle and are named according to their relationship to the axillary artery. Trunks (upper, middle, lower) are formed by the joining of the rami and are located in the posterior triangle of the neck.

**Question 18**

Regarding the brachial plexus, which of the following statements is correct?

A Pectoralis major is the only muscle that can test all roots

B Ulnar nerve palsy results in weakness of the interossei and numbness over the radial part of the hand

C Erb's palsy results in a medially rotated arm with elbow flexion

D Injury proximal to the trunks will not affect the supraspinatus nor infraspinatus muscles

Explanation (A)

Erb's palsy results in a medially rotated arm with the elbow in extension. The nerve supply to supra and infraspinatous comes from the trunks and will be affected if the injury to the BP is at the level of the trunks or proximal to them. Ulnar nerve injury will give weakness to the ulnar part of the hand