1) Drugs alter neuronal action at synapses by :

  A. Altering neurotransmitter release
  B. Altering neurotransmitter re-uptake and degradation
  C. Competing with neurotransmitters for binding to post-synaptic receptors
  D. Chemically alters neurotransmitters, thus inhibiting or enhancing their impact
* E. a, b, and c
  F. All of the above

2) Lidocaine works by

* A. Blocking voltage-gated Na+ channels in peripheral nerves
  B. Blocking Ach at the synapse between the postganglionic PNS neuron and the muscuranic effector site
  C. Inhibiting neurotransmitter release
  D. None of the above

3) Sympathomimetic drugs:

* A. Mimic the action of epinephrine and norepinephrine, neurotransmitters of the SNS system
  B. Have a similar impact as those of Sympatholytic drugs
  C. Interfere with the release of neurotransmitters of the PNS system
  D. Mimic the action of epinephrine and norepinephrine, neurotransmitters of the PNS system
  E. Interfere with the release of neurotransmitters of the SNS system

4) Parasympatholytic drugs:

  A. Inhibit activity of the SNS
  B. Stimulate the release of Ach
* C. Usually act by competitively blocking muscarinic or nicotinic receptors
  D. Inhibit activity of the PNS through their effect on Epinephrine and Norepinephrine

5) Arachnoid granulations (and arachnoid villi) are small protrusions of the arachnoid (the thin second layer covering the brain) through the dura (the thick outer layer). They protrude into the venous sinuses of the brain, and allow cerebrospinal fluid (CSF), produced by the choroid plexus, to exit the brain and enter the blood stream. If arachnoid granulations are blocked for any reason, CSF builds up in the sub-arachnoid space, increasing pressure on the brain. As pressure builds, the most likely component of the brain to be affected is the:

  A. Pressure does not build up as the choroid plexus reduces production of CSF
  B. Cerebrum
* C. Medulla Oblongata
  D. Cerebellum
  E. Pons

6) The Afghan dog's skull shape is best described as

* A. Dolichocephalic
  B. Brachycephalic
  C. Metacephalic
  D. Oligocephalic
  E. None of the above. It's unique, so is referred to as "Afghan"

7) The Organ of Corti and the Cristae (Ampullae) are both lined with hair cells that have the following functions:

  A. Hair cells in both Cristae and the Organ of Corti are responsible for balance while the eardrum transduces sound waves into neural impulses
  B. Hair cells in both Cristae and the Organ of Corti sense sound
* C. The hair cells in the Organ of Corti sense sound while the hair cells in Cristae are responsible for balance
  D. The hair cells in Cristae sense sound while the hair cells in the Organ of Corti are responsible for balance

8) The Utricle and Saccule transduce linear acceleration into neural impulses while Cristae in semicircular canals transduce angular acceleration.

* A. True
  B. False

9) Signs of vestibular disease include ataxia, head tilt, loss of balance and abnormal nystagmus. The semicircular canals have hair cells that provide an animal its sense of balance. Consequently, vestibular ataxia could have its roots in the vestibule of the ear, the vestibular nuclei in the brainstem or the vestibulo-cochlear nerve (VIII).

  A. False
* B. True

10) Additional nerves, required for limbs, result in enlarged portions of the spinal cord. These enlargements occur between

* A. C6-T2 and L4-S3
  B. C6-T2 and L2-L5
  C. T3-L3
  D. No enlargements occur because the additional nerves come off the brachial and lumbar plexuses

11) The S3 segment of the spinal cord in a dog is located at approximately what position with respect to the vertebrae of the spine?

  A. T12
  B. S2-S3
* C. L6
  D. L2

12) The cauda equina is a "horse's tail" of nerves that have their roots at the tip of the spinal cord

  A. True
* B. False

13) There are 3 types of neurological gaits. These are

  A. Vestibular, cerebellar, proprioceptive
* B. Ataxia, paresis, paralysis
  C. Cortical, vestibular, spinal
  D. None of the above

14) When there is a head tilt associated with ataxia, the type of ataxia is called

  A. Cortical
  B. Proprioceptive
  C. Cerebellar
* D. Vestibular
  E. None of the above

15) The reticular formation is found in the

* A. Pons
  B. Cortex
  C. Thalamus
  D. Cerebellum

16) The menace response tests the following :

  A. II, cortex, V
  B. III, IV, VI, VIII, MLF
* C. II, thalamo-cortex, cerebellum, VII
  D. II, III

17) The pupillary light reflex (PLR) tests the following

  A. III, IV, VI, VIII, MLF
* B. II, III
  C. II, thalamo-cortex, cerebellum, VII
  D. II, cortex, V

18) During a pupillary light reflex (PLR), light shone into the left eye does not cause a constriction of the left eye, but does cause one in the right eye. This indicates that the lesion lies in :

  A. Left II
  B. Right II
  C. Thalamo-cortex
  D. Right III
* E. Left III

19) The palpebral reflex tests the following :

  A. III, IV, VI, VIII, MLF
  B. II, cortex, V
  C. II, III
  D. II, thalamo-cortex, cerebellum, VII
* E. V, VII

20) The nasal septum stimulation test is done with the animal's eyes closed. Using a cotton swab, gently touch the nasal mucosa on either side of the nasal septum. The normal response is withdrawal of the head. This tests

  A. VII-maxillary branch, Cortex
  B. VII-mandibular branch, MLF
* C. V-maxillary branch, Cortex
  D. V-mandibular branch, MLF, Cortex
  E. VIII, MLF

21) If a dog has lost tone in its masseter and temporalis muscle, there is likely to be a problem with

* A. V-motor
  B. V-sensory
  C. VII-motor
  D. VII-sensory
  E. None of the above

22) If the face of a cat is skewed to one side, there is likely to be a problem with

  A. V-sensory
  B. V-motor
* C. VII-motor
  D. VII-sensory
  E. None of the above

23) Physiological nystagmus tests for lesions in

* A. III, IV, VI, VIII, MLF
  B. II, III
  C. II, thalamo-cortex, cerebellum, VII
  D. II, cortex, V

24) The Medial longitudinal fasciculus is associated with the following cranial nerves

* A. III, IV, VI, VIII
  B. V, VII
  C. III, V, VIII
  D. II, III

25) If a lesion is affecting the cortex of a dog (and all else is ok), a neurological examination could find

* A. Depression, problem with gait/posture, proprioceptive deficits, reduced menace response, reduced nasal septum response
  B. Depression, problem with gait/posture, proprioceptive deficits, reduced PLR (pupillary light reflex), abnormal physiological nystagmus
  C. Head tilt, no palpebral reflex, abnormal nystagmus, facial asymmetry
  D. None of the above. The cortex is absent in dogs as they rely on the cerebellum.

26) A cranial nerve is damaged due to an injury. What could happen to it?

  A. All CNs can regenerate
  B. None of the CNs can regenerate
  C. It can regenerate because cranial nerves are part of the PNS
* D. Some CNs are part of the PNS, other are part of the CNS. If the one damaged is part of the PNS, it could regenerate; otherwise, it's toast

27) An evil madman cuts through one CN V of a stray cat. When you examine it, you would expect to find deficits in/manifested in

  A. Head tilt
  B. Face drooping, Menace response, Palpebral reflex
  C. Pupillary light reflex, Nasal septum stimulation and degeneration of masticatory muscles
  D. Palpebral reflex and physiological nystagmus
* E. Palpebral reflex, Nasal septum stimulation and degeneration of masticatory muscles

28) A roving Martian watching a human "stooping to scoop" assumes the dog is in charge and abducts it. At some point in the investigation that ensues, a CN VII of the dog is sliced through. When you examine it (the dog, not the Martian!), you would expect to find deficits in

* A. Face tone (resulting in drooping), Menace response, Palpebral reflex
  B. Palpebral reflex and physiological nystagmus
  C. Palpebral reflex, Nasal septum stimulation and degeneration of masticatory muscles
  D. Head tilt
  E. Pupillary light reflex, Nasal septum stimulation and degeneration of masticatory muscles

29) A sign of a lesion in an Upper Motor Neuron would be:

* A. An exaggerated reflex
  B. Lack of corresponding reflex
  C. Depression
  D. Lack of proprioception

30) A sign of a lesion in a Lower Motor Neuron would be:

  A. Depression
  B. Lack of proprioception
  C. An exaggerated reflex
* D. Lack of corresponding reflex

31) The peripheral nerves of the brachial plexus include (multiple answers):

  A. Digital
* B. Ulnar
  C. Accessory
  D. Sciatic
* E. Axillary

32) Lesions affecting only the lumbosacral plexus occur at:

  A. C1-C4
  B. T2-L4
* C. L4-S2
  D. C5-T2

33) The patellar reflex is absent on the right side of the animal only. The lesion is likely to be in:

  A. The spinal cord
  B. An interneuron
* C. A lower motor neuron
  D. The brain

34) The withdrawal reflex of the medial hindlimb tests which nerve for sensory function:

  A. Sciatic nerve
  B. Caudal gluteal nerve
  C. Radial nerve
* D. Femoral nerve

35) Which statement is <u>false</u> regarding lesions in the PNS:

  A. Generally unilateral signs
  B. Local proprioceptive deficits without ataxia
  C. Will usually involve sensory and motor deficits
  D. Will not demonstrate changes in mental status
* E. None of the above

36) In order to distinguish between a lesion in the brain and one in the spinal cord, which <u>two</u> of the following would be the best choices to assess?

  A. Reflexes
* B. Cranial nerves
  C. Cutaneous trunci stimulation
  D. Pupillary light reflex
* E. Mental status

37) Damage to an Upper Motor Neuron (UMN) could result in:

* A. Spastic paralysis & increased muscle tone
  B. Areflexia (missing reflex)
  C. Paralysis & neurogenic muscle atrophy
  D. Paralysis & flaccid muscle tone

38) A lesion at L7 will, most likely, affect the following nerves:

  A. Caudal gluteal & femoral
* B. Sciatic & cranial gluteal
  C. Femoral & sciatic
  D. Femoral & pudendal

39) A lesion at C8 will, most likely, affect the following nerves:

  A. Suprascapular and Subscapular
* B. Axillary and Radial
  C. Since C8 is part of the brachial plexus, all nerves that form the brachial plexus will be affected
  D. Suprascapular and Axillary

40) Reflexes :

  A. allow rapid responses to stimuli
  B. involve the thalamus
  C. have afferent & efferent neurons which enter & exit the spinal cord at the same level
* D. A & C

41) If there are Upper Motor Neuron signs in the hindlimbs and Lower Motor Neuron signs in the forelimbs, the lesion is likely to be present at:

  A. T3-L3
* B. C6-T2
  C. C1-C5
  D. L4-S2

42) Upper Motor Neuron signs are present in both forelimbs and hindlimbs. LMN reflexes seem normal. The lesion is likely to be at:

  A. C6-T2
* B. C1-C5
  C. T3-L3
  D. L4-S2

43) Cranial nerve examination only tests the integrity of the cranial nerve fibres.

* A. False
  B. True

44) It is easiest to remember the cranial nerve examination by performing it consistently and working in order through the cranial nerves. Thus, it is always important that you start by testing the olfactory nerve (CN I)

  A. True
* B. False

45) An abnormal menace response on its own does not provide a great deal of information to pinpoint the lesion.

  A. False
* B. True

46) You shine a penlight in "Rusty" the Golden Retriever's left eye and you observe that neither of his pupils constrict. You then shine your light in his right eye and notice that both the right and the left pupil constrict. Your proficiency in neurology will allow you to localize the lesion to

  A. Left optic tract
  B. Optic chiasm
  C. Left nucleus of CN III
* D. Left optic nerve
  E. Impossible to say

47) CN III is the:

  A. Ocular nerve
  B. Olfactory nerve
* C. Oculomotor nerve
  D. Optic nerve
  E. Oculopupillary nerve

48) Strabismus can indicate a problem with which of the following cranial nerves:

  A. CN II
* B. CN IV
  C. CN VII
  D. CN V
  E. CN VIII

49) The nucleus for the trochlear nerve is in which segment of the brain?

  A. Cortex
  B. Brainstem
  C. Hypothalamus
  D. Cerebellum
* E. Midbrain

50) The three branches of the trigeminal nerve (CN V) are:

  A. buccal, facial, mandibular
  B. facial, mandibular, maxillary
* C. mandibular, maxillary, ophthalmic
  D. buccal, maxillary, ophthalmic
  E. facial, nasal, maxillary

51) The trigeminal nerve is solely sensory - it transports sensory info from the face.

* A. False
  B. True

52) The facial nerve (CN VII) is solely motor and it innervates the muscles of facial expression.

  A. True
* B. False

53) Pathological nystagmus may occur if there is a lesion in the MLF (medial longitudinal fasciculus).

* A. True
  B. False

54) You may want to test the glossopharyngeal nerve (CN IX) if you were aware of which of the following signs in one of your patients:

  A. Drooping lips/snout
  B. Impaired tongue movements
  C. Lacerations on the rostral tongue (likely indicative of a sensory deficit to that area)
* D. History of regurgitation
  E. All of the above

55) Which cranial nerve provides motor innervation to the tongue?

  A. XI
* B. XII
  C. VIII
  D. XIII
  E. IX

56) The palpebral reflex involves which cranial nerves?

* A. CN V and VII
  B. CN II and VII
  C. CN VII and VIII
  D. CN II and III
  E. CN V and VI

57) The tapetum lucidum is _____ part of the eye.

  A. crocodile-like
* B. vascular tunic
  C. fibrous tunic
  D. internal tunic
  E. liquid component

58) Which neuroglial cell helps maintain the blood-brain barrier?

  A. Ependymal cells
  B. Astrodome
  C. Microglia
* D. Astrocyte

59) Which neuroglial cell phagocytoses pathogens and cellular debris?

  A. Macrophage
  B. Ependymal cells
  C. Astrocyte
* D. Microglia

60) Which neuroglial cell is an epithelial cell that lines the brain’s ventricles and the central canal of the spinal cord?

  A. Astrocyte
* B. Ependymal cells
  C. Microglia
  D. Endothelium

61) Which of the following is true (multiple answers):

  A. Astrocytes are similar in function to macrophages
  B. Oligodendrocytes and Schwann cells myelinate axons in the CNS
* C. Ependymal cells are often ciliated
* D. Oligodendrocytes myelinate axons in the CNS
  E. Microglia are synonymous with oligodendrocytes

62) Sublethal injury of an axon in the PNS leads to this series of events:

* A. Degeneration from the site of injury toward the axon terminal (anterograde), and from the site of injury toward the cell body (retrograde); Development of growth processes; Re-establishment of synapse with target
  B. Degeneration from the site of injury toward the axon terminal (retrograde), and from the site of injury toward the cell body (anterograde); Development of growth processes; Re-establishment of synapse with target
  C. Degeneration; Mitosis of adjacent neuron to replace degenerated one
  D. Degeneration of axon from synapse to perikaryon; Lengthening of growth processes; Re-establishment with target

63) Regeneration of a neuron will not occur if:

  A. The proliferating stroma blocks the growth process.
  B. The target neuron is atrophied.
  C. There is an excess of acetylcholinesterase at the synapse between the injured neuron and the target neuron.
* D. A and B
  E. All of the above

64) Transneuronal degeneration:

  A. is seen especially in the visual system
  B. is seen especially in the spinal cord
  C. may be anterograde or retrograde
* D. A and C
  E. B and C

65) Which statement is false regarding ion channels?

  A. There are light-gated and mechanically-gated ion channels.
  B. There are voltage-gated and chemically-gated ion channels
  C. Ion channels are multisubunit proteins that span the cell membrane and allow the selective passage of ions.
* D. None of the above

66) Resting membrane potential is usually around -70 to -90 mV. It is due to:

  A. Na/K ATPase pump that pumps 2 Na+ out for every 3 K+ ions it pumps in.
  B. Na/K ATPase pump that pumps 3 Na+ out for every 2 K+ ions it pumps in.
  C. The cell membrane being relatively impermeable to anions, Na+ and Cl-, but selectively permeable to K+.
  D. A and C
* E. B and C

67) Which is true about neuromuscular junctions?

* A. The neurotransmitter is acetylcholine
  B. Neurotransmitter release causes relaxation of the muscle
  C. The neurotransmitter is norepinephrine
  D. None of the above

68) Neurotransmitter release at a synapse can result in:

  A. Excitation of the postsynaptic neuron by activating ion channels which make the resting membrane potential more negative
  B. Inhibition of the postsynaptic neuron by activating ion channels which make the resting membrane potential less negative
  C. Either of A or B
* D. Neither of A or B

69) Toxins and drugs may achieve their effects at a synapse by:

  A. Modifying the rate of neurotransmitter release.
  B. Modifying the rate of neurotransmitter breakdown or re-uptake.
  C. Modifying receptor activity on the postsynaptic membrane.
* D. All of the above
  E. None of the above

70) The class of neurotransmitters that epinephrine falls into is:

  A. Neuropeptides
  B. Amino acids
  C. Acetylcholine
* D. Amines
  E. None of the above

71) Which of the following is correct for the condition known as discospondylosis?

* A. it is a degeneration or proliferation of bony material at the vertebral articulations
  B. it is a herniation or prolapse of disc material into the spinal canal
  C. it is an infection of the vertebreal articulations
  D. None of the above

72) Where would one find cerebrospinal fluid?

  A. In the pia mater
  B. Between the dura mater and the arachnoid
* C. In the subarachnoid space
  D. In the dura mater

73) Which of the following is <u>false</u> about spinal cord grey matter?

* A. The ventral horn region contains the cell bodies of sensory neurons
  B. The lateral horn region contains the cell bodies of sympathetic neurons
  C. The dorsal horn region contains the cell bodies of interneurons
  D. All of the above are true

74) Which of the following is FALSE about the dorsal root ganglion?

* A. It contains cell bodies of afferent sensory neurons and efferent motor neurons
  B. It is located at the entry point into the spinal cord of the dorsal root of the spinal nerve
  C. It carries information associated with myotactic (muscle stretch) positioning
  D. It carries information associated with pain
  E. All of the above are true

75) Which statement concerning cerebrospinal fluid is true?

  A. CSF is produced by the fourth ventricle
* B. CSF is taken up by the venous system using a passive process at arachnoid granulations
  C. The CSF carries high amounts of ions due to the high ion turnover of the spinal cord
  D. CSF is a cell-rich environment
  E. Hydrocephalus (a disease associated with cerebrospinal fluid) is characterized by a drop in CSF pressure and volume

76) Which of the following increases the susceptibility of a nerve tract (sensory or motor) to injury?

  A. Central location of tract (i.e away from the periphery)
  B. Close proximity to artery
* C. High degree of myelination
  D. Small size

77) With respect to nerve damage, what is the order (first to last) in which the following sensations are lost i) Touch and Pressure ii) Proprioception iii) Pain

  A. i, iii, ii
* B. ii, i, iii
  C. ii, iii, i
  D. i, ii, iii

78) Which is true about the dorsal column of the spinal cord?

  A. It carries pain information
* B. Information in it ascends to the cortex for integration
  C. It decussates substantially
  D. It is the last tract to be damaged during injury due to its small fibers and low myelination
  E. All of the above are true

79) Which statement is FALSE about the following tracts?

* A. The ascending reticular activating system (RAS tract) carries proprioceptive information in multisynaptic pathways
  B. The dorsal column includes the fasciculus gracilis (caudal to T6) and the fasciculus cuneatus (cranial to T6)
  C. Damage to the dorsal column can result in proprioceptive deficits
  D. The ventrolateral tract contains fibers of small diameter

80) What is NOT a general rule with respect to ascending pathways?

* A. Unconscious proprioception always decussates (crosses the midline)
  B. The primary neuron's cell body is always in the dorsal root ganglion
  C. Conscious sensation always decussates (crosses the midline)
  D. The primary neuron always enters the spinal cord via the dorsal root

81) What is true about motor information tracts?

  A. Unlike sensory information, they ascend in grey matter
  B. There are two major and two minor motor pathways of significance in domestic species
* C. They often require corresponding sensory pathways to be intact in order to test for normality
  D. Like sensory information, they ascend in grey matter

82) Which of the following statements is true about descending tracts of the spinal cord?

  A. The vestibulospinal tract is mostly ipsilateral, with some decussation to the contralateral side
  B. The reticulospinal tract is entirely ipsilateral
* C. The rubrospinal tract is involved with large muscle movements, like limb movement
  D. The corticospinal tract originates in the red nucleus, in the region of the thalamus

83) Which of the following is the vestibulospinal tract responsible for?

  A. synergy of muscle movements
  B. balance
  C. equilibrium
* D. All of the above

84) Which of the following neurotransmitters is found at the neuromuscular junction?

  A. GABA
  B. Nirtous Oxide
  C. Muscarine
  D. Norepinephrine
* E. Acetylcholine

85) ___ flows into the axon to depolarize it; ___ flows into the axon terminal to cause neurotransmitter release.

  A. Ca++ / Ca++
  B. Na+ / Cl-
  C. Na+ / Na+
  D. Ca++ / Na+
* E. Na+ / Ca++

86) _____ acts on _____ receptors at the neuroeffector junction between the ciliary ganglion and the iris muscles of the eye to constrict the pupil.

* A. acetylcholine; muscarinic
  B. epinephrine; beta
  C. acetycholine; nicotinic
  D. acetylcholine; atriatic
  E. epinephrine; alpha

87) These sympathetic ganglia exist as a pair of chains that parallel the vertebral column throughout the thoracic region.

  A. vertebral ganglia
  B. terminal ganglia
  C. prevertebral ganglia
  D. splanchnic ganglia
* E. paravertebral ganglia

88) All of the following will be observed upon activation of the sympathetic nervous system except:

  A. bronchodialation
  B. reduced gut motility
  C. pupillary dilation
* D. elevated saliva production
  E. increased glucose release into the blood

89) The motor activities of our visceral organs are controlled by the autonomic nervous system. What is responsible for the sensory component of our viscera?

  A. the hypothalamo-pituitary-gonadal axis
* B. the general visceral afferent system
  C. the somatic nervous system
  D. Nothing. We can’t consciously feel what’s going on inside our gut
  E. the autonomic nervous system controls sensory too

90) All of the following are true about the parasympathetic nervous system except:

  A. the vagus nerve is the most important parasympathetic nerve because it controls the viscera
  B. the pupillary light reflex elicits a parasympathetic response
  C. acetylcholine acts on nicotinic receptors in PSNS autonomic ganglia
  D. preganglionic fibers are much longer than postganglionic fibers
* E. parasympathetic fibers exit the spinal cord with the sympathetic fibers, however, they synapse on different ganglia

91) If an animal has a flaccid urethral sphincter but a normal detrusor reflex, this would indicate damage to:

  A. both the pelvic and pudendal nerve
* B. the pudendal nerve
  C. the pelvic nerve
  D. the spinal cord below L1
  E. the spinal cord above L1

92) Transection of the spinal cord at T4 will not have an effect of the detrusor reflex.

  A. True
* B. False

93) The urethral sphincter reflex, like the patellar reflex, is a monosynaptic somatic reflex

  A. False
* B. True

94) The detrusor reflex sensory neurons synapse in the sacral spinal cord before ascending to the pons

* A. False
  B. True

95) If an animal with spinal cord damage has lost control over micturition, it will probably lack voluntary motor movement.

  A. False
* B. True

96) An animal, that has just been hit by a car, has a confirmed spinal cord lesion. Why is it advisable to place a urinary catheter in such a situation?

  A. to collect a urine sample as quickly as possible
  B. because the shock response of the animal will prevent the urethral sphincter from opening
  C. the use of a catheter would not be useful
* D. because damage to the spinal cord has potential to damage the detrusor reflex
  E. because the animal hasn’t suffered enough yet

97) A lesion in a sacral segment has disabled APs through the pudendal nerve. Which of the following scenarios is likely?

  A. Possibility of urinary bladder rupture due to urethral sphincter tetany
  B. The detrusor reflex will be disrupted
  C. No change in the micturition reflex
* D. Constant urine leakage due to loss of urethral sphincter tone

98) A lesion in a sacral segment has disabled UMNs passing through as well as APs through the pelvic nerve. Which of the following scenarios is likely?

  A. No change in the micturition reflex
* B. Possibility of urinary bladder rupture due to urethral sphincter tetany
  C. The detrusor reflex will be unaffected
  D. Constant urine leakage due to loss of urethral sphincter tone

99) The nerve cell bodies of the myenteric plexus is/are:

  A. Contained in the Dorsal Root of the spinal cord
  B. A combination of spinal nerves emanating from the spinal cord between L6-S3
  C. Exit the Red Nucleus via the Rubrospinal tract
  D. All of the above
* E. None of the above

100) Which of the following statements is TRUE?

  A. The Myenteric Plexus spans the Small Intestine while the Submucosal Plexus spans the Large Intestine.
  B. The Submucosal Plexus spans the Small Intestine while the Myenteric Plexus spans the Large Intestine.
  C. The Myenteric Plexus is Parasympathetic and the Submucosal Plexus is Sympathetic.
  D. Both A and C
* E. None of the above

101) Which of the following is FALSE?

* A. The ENS receives no input from the CNS.
  B. Action potentials within the ENS arise spontaneously (similar to pacemaker activity in the heart
  C. Action potentials within the ENS may arise due to mechanical stimuli such as stretch.
  D. ENS is responsible for changes in secretion and smooth muscle contraction.
  E. None of the above.

102) Gastrointestinal neuro-physiology is important because

* A. GI disturbances are a major medical problem and may have roles in several clinical diseases.
  B. It helps explain why cats eat string.
  C. G.I. disturbances are actually quite insignificant
  D. It is the key to understanding the balance between Parasympathetic and Sympathetic interaction.
  E. All of the above.

103) Which of the center(s) of physiologic function does the Pons contain?

  A. Respiratory centers
  B. Cardiac centers
  C. Vasomotor centers
* D. None of the above
  E. All of the above

104) The Pons is responsible for integration of the Micturition response.

* A. True
  B. False

105) Which of the components of the Midbrain is involved in visual reflexes?

  A. Red Nucleus
  B. Tegmentum
  C. Tectum
* D. Rostral Colliculi
  E. Caudal Colliculi

106) The Reticular formation is:

* A. Located between the medulla and thalamus and is responsible for arousal and consciousness
  B. Dorsal to the cerebellum and is responsible for regulating motor activity through the reticulospinal tract.
  C. Within the Red Nucleus and regulates respiratory activity via connections with the respiratory nuclei (centers) in the medulla.
  D. None of the above.
  E. All of the above.

107) The Vermis, Hemispheres and Peduncles are features of which portion of the brain?

  A. Midbrain
  B. Pituitary
  C. Cerebral Cortex
* D. Cerebellum
  E. Pons

108) The Thalamus is intimately linked to the pituitary and is responsible for controlling homeostasis via secretion of hormones such as ACTH, etc.

  A. True
* B. False

109) Which of the following components does the Cerebrum contain?

  A. Limbic System.
  B. Caudal Colliculi.
  C. Basal Nuclei.
  D. Both A and B
* E. Both A and C

110) Which of the following is/are <u>not</u> a part of the Limbic system of the Cerebrum?

  A. Hippocampus
* B. Tectum
  C. Amygdala
  D. Both A and B
  E. Both B and C

111) The Pons contains the nuclei of which cranial nerves?

  A. II, III, IV
  B. I, II, III
  C. The pons contains nuclei for no cranial nerves
  D. The Pons contains nuclei for all cranial nerves.
* E. V, VI, VII, VIII

112) The thalamus is a relay site for both sensory and motor information.

  A. False
* B. True

113) Which if the following is not a part of the Cerebellar nuclei of the Cerebellum?

* A. Tectoform
  B. Emboliform
  C. Fastigil
  D. Dentate
  E. Globose

114) "Doc", a 5 yr old DSH, is very weak and staggering. The physical exam suggests only neurological problems. Neurological exam : Severe weakness in the hind limbs with increased tone; however, normal patellar/withdrawal reflex. Also, decreased proprioception in the hind limbs. All else is normal. Doc's lesion is

  A. In the spinal cord between C1 and C5 because all four limbs are affected
* B. In the spinal cord between T3 and L3 because there are UMN signs to the hind limbs only
  C. In the spinal cord between C6 and T2 because there are UMN signs to the hind limbs only
  D. In the spinal cord between C6 and T2 because there are UMN signs to the fore limbs and LMN signs to the hind limbs
  E. In the spinal cord between L4 and S2 because there are UMN signs to the hindlimbs.

115) "Doc", a 5 yr old DSH, is very weak and staggering. The physical exam suggests only neurological problems. Neurological exam : Severe weakness in the hind limbs. Normal patellar reflex in both hind limbs. Normal withdrawal reflex in both hind limbs. Increased tone in muscles of hind limbs. Decreased proprioception in the hind limbs. Normal pain sensation. Doc retains pain sensation because

* A. The ascending RAS has small fibres which are present in several different regions of the spinal cord and are not as susceptible to injury
  B. The injury in the spinal cord is confined to gray matter and does not affect the ascending tracts
  C. The vestibulospinal pathway is ipsilateral and may not be affected by a lesion on the opposite side
  D. The spinothalamic (ventrolateral) tract synapses and decussates after fibres enter the spinal cord which decreases the chances of injury
  E. The dorsal column system has heavily myelinated fibres which are relatively resistant to injury

116) "Doc", a 5 yr old DSH, is very weak and staggering. The physical exam suggests only neurological problems. Neurological exam : Severe weakness in the hind limbs. Normal patellar reflex in both hind limbs. Normal withdrawal reflex in both hind limbs. Increased tone in muscles of hind limbs. Decreased proprioception in the hind limbs. Normal pain sensation. Doc's patellar reflex is normal because ...

A. Sensory impulses in the afferent component of the reflex arc continue to ascend past the site of the lesion because the fibres are resistant to injury
B. The golgi tendon organs in the patellar tendon continue to respond to motor impulses in the lower motor neuron
C. The reflex arc enters and leaves the spinal cord at the brachial enlargement and does not require input from UMNs which are affected by the lesion
D. The multisynaptic reflex enters and exits the spinal cord at spinal levels L2 and L4 and does not require input from UMNs which are damaged by the lesion
* E. It is a monosynaptic reflex arc which is decreased or absent only when the lesion is at the site of entry/exit from the spinal cord

117) "Doc", a 5 yr old DSH, is very weak and staggering. The physical exam suggests only neurological problems. Neurological exam : Severe weakness in the hind limbs. Normal patellar reflex in both hind limbs. Normal withdrawal reflex in both hind limbs. Increased tone in muscles of hind limbs. Decreased proprioception in the hind limbs. Normal pain sensation. Proprioception is decreased in Doc's hindlimbs because ...

A. The spinothalamic tract is affected as it passes by the lesion
B. The axons in the dorsal column and spinocerebellar tracts which carry motor impulses are the most susceptible to injury and have been damaged by the lesion
C. The grey matter between T3 and L3 has been damaged by the lesion and is a site of synapses for the ascending proprioceptive fibres
* D. Nerve fibres which carry proprioceptive impulses have been damaged
E. None of the above explains it.

118) "Doc", a 5 yr old DSH, is very weak and staggering. The physical exam suggests only neurological problems. Neurological exam : Severe weakness in the hind limbs. Normal patellar reflex in both hind limbs. Normal withdrawal reflex in both hind limbs. Increased tone in muscles of hind limbs. Decreased proprioception in the hind limbs. Normal pain sensation. Muscle tone in Doc's hind limbs is increased because ...

A. Reciprocal inhibitory reflexes from the opposing muscle groups have been damaged at the same spinal level
* B. Some inhibitory upper motor neurons to the hindlimbs have been damaged as they pass the lesion
C. Spastic paralysis is a typical sign of injury to grey matter at the site of the lesion
D. Excitatory motor neurons in the descending pathways have an increased rate of firing due to the injury, which increases muscular tone

119) "Doc", a 5 yr old DSH, is very weak and staggering. The physical exam suggests only neurological problems. Neurological exam : Severe weakness in the hind limbs. Normal patellar reflex in both hind limbs. Normal withdrawal reflex in both hind limbs. Increased tone in muscles of hind limbs. Decreased proprioception in the hind limbs. Normal pain sensation. If the spinal cord lesion is severe in the present location, it will cause which of the following :

A. Loss of inhibitory components of the detrusor reflex will lead to increased tone in the muscle of the bladder wall
B. Micturition will be affected leading ot spastic paralysis of the bladder and flaccid paralysis of the urethral sphincter.
C. Disruption of the sphincter reflex will result in frequent urination of small volumes of urine
* D. Loss of inhibitory UMNs to the urethral sphincter reflex will lead to increased tone in the urethral sphincter

120) Which of the following is NOT considered a neuroglial cell?

A. Astrocytes
B. Microglia
C. Oligodendroglia
D. Schwann cells
* E. Endothelia

121) The blood-brain barrier

A. Restricts the passage of nutrients from the bloodstream to neurons
B. Limits the delivery of certain therapeutic agents in the brain
C. Cannot prevent toxin uptake from the bloodstream by neurons
D. Is maintained by fenestrated capillary endothelium and astrocytic processes
* E. a and b are correct

122) Myelinated axons

A. Conduct action potentials more rapidly than non-myelinated axons
B. Have Nodes of Ranvier which occur along their length
C. Are surrounded by Schwann cells in the PNS
* D. a, b and c are correct
E. Only a and b are correct

123) Which of the following is true of ion channels?

A. They maintain the resting membrane potential.
B. They are highly responsive to further stimuli during the period when the inactivation gate is closed
C. They open exclusively in response to changes in voltage across the cell membrane
D. They have resident enzymatic activity which pumps ions into or out of the cell
* E. Each channel conducts a single type of ion

124) Which of the following is NOT true with respect to action potentials?

* A. They are propagated along an axon primarily by voltage gated calcium channels
  B. They require a rapid influx of Na+ from the extracellular fluid
  C. Peak depolarization occurs at approximately +30 mV
  D. They are the primary mechanizm for the transmission of information within the nervous system
  E. They are stimulated within a neuron when the sum of graded potentials decreases the resting membrane potential to a threshold value of approximately -55 mV

125) Neurotransmitters released at a synapse:

  A. Can interact with receptors on the post-synaptic membrane
  B. Can be metabolized by enzymes which are present in the synaptic cleft
  C. Can by taken up by endocytosis in the presynaptic membrane
* D. All of the above

126) Which of the following statements is <u>incorrect</u>?

  A. CSF enters the subarachnoid space via the lateral foramina
  B. Cerebrospinal fluid (CSF) can be found immediately outside the pia layer
  C. The dura is the toughest and outermost menix
  D. The pia is the innermost menix and contains many blood vessels
* E. CSF is reabsorbed into the bloodstream by the choroid plexus in the subarachnoid space

127) The spinal cord:

  A. Contains white matter tracts which are sites of entry/exit of individual neurons
  B. Contains cell bodies of sensory neurons in the dorsal gray matter horns
* C. Contains cell bodies of motor neurons in the ventral gray matter horns
  D. Contains cell bodies of sympathetic neurons in the lateral gray matter horns of the cervical region

128) Fibres carrying action potentials relaying conscious sensory information

  A. Enter via the dorsal root
  B. Often decussate somewhere en route to the brain
  C. Ascend in the spinocerebellar tracts when the information relayed is proprioceptive
  D. Pass through a synapse in the ventral grey matter horn before ascending
* E. a and b are correct

129) Which of the following pathways does NOT carry afferent (sensory) information?

  A. Dorsal Spinocerebellar tract
  B. Spinothalamic tract
  C. Ascending RAS
* D. Rubrospinal tract
  E. Dorsal Column

130) In the sympathetic nervous system:

* A. The neurotransmitter between the pre and post-ganglionic fibre is acetycholine
  B. Neurons of the sympathetic nervous system leave the spinal cord in the thoracolumbar region and synapse on striated muscle throughout the viscera and vasculature
  C. The neurons primarily control homeostatic functions
  D. Neurons synapse primarily in the prevertebral ganglia
  E. a and d are correct

131) With reference to the parasympathetic nervous system:

* A. Preganglionic neurons leave the CNS via cranial nerves III, VII, IX, X and sacral spinal nerves
  B. Norepinepherine is the neurotransmitter utilized by both pre and post ganglionic neurons
  C. Neurons synapse primarily in the paravertebral ganglia
  D. Control of urethral sphincter tone is an important function of parasympathetic neurons in the sacral spinal cord
  E. a and d are correct

132) Which of the following is INCORRECT?

  A. Although it can function autonomously, the enteric nervous system has extensive efferent input from the autonomic nervous system
  B. The myenteric plexus is found between muscle layers in the gut
  C. Opioids are neurotransmitters within the ENS which markedly decrease secretion and increase segmental motility
  D. Action potentials within the enteric nervous system often arise spontaneously
* E. Acetylcholine is a neurotransmitter of the enteric nervous system which inhibits gut motility

133) Which of the following is NOT considered true of neurons?

* A. They conduct impulses in at least two directions
  B. They conduct action potentials along their axons
  C. They may be unipolar, bipolar or multipolar
  D. They are the basic functional unit of the nervous system
  E. They normally have a resting membrane potential between -70mV and -90mV

134) A 3 yr old gelding is noticed to have a wide stance, a head tilt and to stumble when forced to walk. The horse is slightly depressed, has a head tilt to the left and rapid, horizontal back-and-forth eye movements when in the normal resting position. There is a palpable decrease in tone and mass in the muscles on the left side of the head and the palpebral reflex is completely absent in all sites. The horse is ataxic and slightly weak, particularly on the left side. The remainder of the examination is normal. Rapid eye movement of this type is called :

* A. Nystagmus and is probably due to a lesion involving CN VIII or its nucleus
  B. Nystagmus and is probably due to a lesion involving CN III or its nucleus
  C. Strabismus and is probably due to a lesion involving CN III, IV or VI
  D. Nystagmus and is probably due to a lesion somewhere in the cortex
  E. c and d are correct

135) A 3 yr old gelding is noticed to have a wide stance, a head tilt and to stumble when forced to walk. The horse is slightly depressed, has a head tilt to the left and rapid, horizontal back-and-forth eye movements when in the normal resting position. There is a palpable decrease in tone and mass in the muscles on the left side of the head and the palpebral reflex is completely absent in all sites. The horse is ataxic and slightly weak, particularly on the left side. The remainder of the examination is normal. The loss of mass and tone in the muscles of the head in the horse are

  A. Related to the loss of the palpebral reflex and suggest a lesion involving CN VII
  B. Related to strabismus and suggest a lesion involving CN VII
  C. Caused by a loss of motor neurons in CN VII which innervates the face
* D. Related to the loss of the palpebral reflex and suggest a lesion involving CN V
  E. Related to strabismus and suggest a lesion involving CN V

136) A 3 yr old gelding is noticed to have a wide stance, a head tilt and to stumble when forced to walk. The horse is slightly depressed, has a head tilt to the left and rapid, horizontal back-and-forth eye movements when in the normal resting position. There is a palpable decrease in tone and mass in the muscles on the left side of the head and the palpebral reflex is completely absent in all sites. The horse is ataxic and slightly weak, particularly on the left side. The remainder of the examination is normal. The head tilt in this horse may be due to a lesion involving the :

  A. cerebral cortex on the right side
  B. peripheral vestibular nerve on the left side
  C. semicircular canals on the left side
  D. b and c are correct
* E. None of the above are correct

137) A 3 yr old gelding is noticed to have a wide stance, a head tilt and to stumble when forced to walk. The horse is slightly depressed, has a head tilt to the left and rapid, horizontal back-and-forth eye movements when in the normal resting position. There is a palpable decrease in tone and mass in the muscles on the left side of the head and the palpebral reflex is completely absent in all sites. The horse is ataxic and slightly weak, particularly on the left side. The remainder of the examination is normal. The problem in the horse is a :

  A. Lesion in the vestibular nerve and the facial nerve where they run together on the left side
  B. Central lesion involving the nucleus of CN VII on the left side
* C. Lesion in the brainstem on the left side
  D. Lesion involving CN V and VIII near the point where they enter the brain on the left side
  E. Lesion in the cerebral cortex on the right side