Here is a **reorganized, verified, and complete set of 100 USMLE-style MCQs** based on the provided CNS Physiology notes:

Vestibular System (10 Questions)

1. **Which structure detects vertical linear acceleration?**

   A. Utricle

   B. Saccule

   C. Semicircular canals

   D. Cupula

   Answer: B

2. **During constant head rotation, semicircular canals are:**

   A. Depolarized

   B. Hyperpolarized

   C. Inactive

   D. Overstimulated

   Answer: C

3. **Bending stereocilia away from the kinocilium results in:**

   A. Depolarization

   B. Hyperpolarization

   C. Increased neurotransmitter release

   D. Calcium influx

   Answer: B

4. **The vestibulo-ocular reflex is characterized by:**

   A. Eyes moving in the same direction as head rotation

   B. Nystagmus defined by the slow phase

   C. Fast phase resetting eye position

   D. Loss of balance during rapid movement

   Answer: C

5. **A patient with bilateral vestibular dysfunction can maintain balance if:**

   A. Eyes are closed

   B. Moving rapidly

   C. Eyes are open and movement is slow

   D. Standing on one leg

   Answer: C

6. **Otoliths are composed of:**

   A. Collagen fibers

   B. Calcium carbonate crystals

   C. Sodium chloride

   D. Potassium channels

   Answer: B

7. **The cupula is a gelatinous structure found in the:**

   A. Utricle

   B. Saccule

   C. Ampulla of semicircular canals

D. Macula

Answer: C

8. **Which pathway is involved in conscious awareness of head position?**

A. Spinal cord → cerebellum

B. Thalamus → parietal lobe

C. Vestibular nuclei → CN III

D. Reticular formation → medulla

Answer: B

9. **Loss of the utricle would impair detection of:**

A. Vertical acceleration

B. Horizontal acceleration

C. Rotational movement

D. Gravity

Answer: B

10. **The fast phase of nystagmus is directed:**

A. Opposite to head movement

B. Toward the damaged vestibular apparatus

C. Same as head movement

D. Downward

Answer: C

Motor Cortex (10 Questions)

11. **Lesion of the supplementary motor area causes difficulty with:**

A. Speech production

B. Bilateral coordination

C. Handwriting

D. Eye tracking

Answer: B

12. **Broca's area lesion results in:**

A. Receptive aphasia

B. Expressive aphasia

C. Alexia

D. Ataxia

Answer: B

13. **The primary motor cortex is responsible for:**

A. Planning movement

B. Coordinating bilateral movements

C. Executing fine motor control

D. Regulating muscle tone

Answer: C

14. **The corticospinal tract decussates at the:**

A. Spinal cord segment

B. Midbrain

C. Medulla pyramids

D. Pons

Answer: C

15. **Mirror neurons are primarily located in the:**

A. Primary motor cortex

B. Premotor area

C. Supplementary motor area

D. Cerebellum

Answer: B

16. **Motor apraxia is caused by damage to the:**

A. Hand skills area

B. Primary motor cortex

C. Basal ganglia

D. Thalamus

Answer: A

17. **The homunculus in the primary motor cortex devotes the most space to:**

A. Trunk

B. Legs

C. Face and hands

D. Neck

Answer: C

18. **Which pathway controls distal limb muscles?**

A. Anterior corticospinal

B. Corticobulbar

C. Lateral corticospinal

D. Vestibulospinal

Answer: C

19. **Static neurons in the motor cortex are responsible for:**

A. Initiating contraction

B. Maintaining contraction force

C. Inhibiting antagonists

D. Sensory feedback

Answer: B

20. **A lesion in the contralateral eye movement area causes:**

A. Ptosis

B. Inability to shift gaze voluntarily

C. Nystagmus

D. Diplopia

Answer: B

Basal Nuclei (10 Questions)

21. **The direct pathway of the basal nuclei facilitates movement by:**

A. Inhibiting the thalamus

B. Reducing inhibition on the thalamus

C. Exciting the subthalamic nucleus (STN)

D. Increasing dopamine release

Answer: B

22. **Parkinson’s disease is characterized by degeneration of the:**

A. Striatum

B. Substantia nigra pars compacta

C. Globus pallidus externus

D. Subthalamic nucleus

Answer: B

23. **The indirect pathway ultimately leads to:**

A. Thalamic excitation

B. Suppression of movement

C. Increased dopamine release

D. Enhanced muscle tone

Answer: B

24. **Huntington’s disease involves loss of neurons in the:**

A. Caudate and putamen

B. Globus pallidus

C. Subthalamic nucleus

D. Substantia nigra

Answer: A

25. **Dopamine acting on D2 receptors in the indirect pathway causes:**

A. Excitation

B. Inhibition

C. Increased GABA release

D. Calcium influx

Answer: B

26. **The subthalamic nucleus releases:**

A. GABA

B. Glutamate

C. Dopamine

D. Serotonin

Answer: B

27. **A patient with Parkinson's would exhibit:**

A. Choreiform movements

B. Mask-like facies

C. Intention tremor

D. Hyperkinetic speech

Answer: B

28. **The striatum receives input primarily from the:**

A. Thalamus

B. Cortex

C. Cerebellum

D. Spinal cord

Answer: B

29. **Output nuclei of the basal ganglia include the:**

A. Globus pallidus internus and substantia nigra reticulata

B. Caudate and putamen

C. Subthalamic nucleus

D. Red nucleus

Answer: A

30. **Increased activity of the indirect pathway leads to:**

A. Bradykinesia

B. Hemiballismus

C. Chorea

D. Dystonia

Answer: A

Spinal Cord & Reflexes (10 Questions)

31. **The stretch reflex is:**

A. Polysynaptic

B. Inhibitory

C. Mediated by Golgi tendon organs

D. Monosynaptic

Answer: D

32. **Reciprocal innervation in the stretch reflex involves:**

A. Inhibition of the agonist

B. Excitation of the antagonist

C. Inhibition of the antagonist

D. Crossed extensor response

Answer: C

33. **Gamma motor neurons innervate:**

A. Extrafusal fibers

B. Intrafusal fibers

C. Golgi tendon organs

D. Joint receptors

Answer: B

34. **The Golgi tendon reflex protects against:**

A. Overstretching

B. Overcontraction

C. Hypoxia

D. Pain

Answer: B

35. **Type Ia afferents detect:**

A. Slow muscle stretch

B. Rapid muscle stretch

C. Tension

D. Vibration

Answer: B

36. **The crossed extensor reflex is:**

A. Ipsilateral

B. Monosynaptic

C. Contralateral

D. Mediated by muscle spindles

Answer: C

37. **Coactivation of alpha and gamma motor neurons ensures:**

A. Muscle relaxation

B. Spindle sensitivity during contraction

C. Inhibition of antagonists

D. Increased tendon tension

Answer: B

38. **A patient with loss of deep tendon reflexes likely has damage to:**

A. Golgi tendon organs

B. Muscle spindles

C. Alpha motor neurons

D. Gamma motor neurons

Answer: C

39. **The flexor reflex is:**

A. Monosynaptic

B. Polysynaptic

C. Contralateral

D. Mediated by Golgi tendon organs

Answer: B

40. **Nuclear chain fibers are associated with:**

A. Type Ia afferents

B. Type II afferents

C. Gamma motor neurons

D. Extrafusal fibers

Answer: B

Brainstem (10 Questions)

41. **The medullary respiratory center regulates:**

A. Voluntary breathing

B. Basic respiratory rhythm

C. Cough reflex

D. Olfactory processing

Answer: B

42. **Decerebrate rigidity is caused by overactivity of the:**

A. Medullary reticulospinal tract

B. Pontine reticulospinal tract

C. Corticospinal tract

D. Vestibulospinal tract

Answer: B

43. **The red nucleus is located in the:**

A. Medulla

B. Pons

C. Midbrain

D. Thalamus

Answer: C

44. **The reticular activating system (RAS) is essential for:**

A. Digestion

B. Consciousness

C. Thermoregulation

D. Hormone secretion

Answer: B

45. **The superior colliculi are involved in:**

A. Auditory reflexes

B. Visual reflexes

C. Pain modulation

D. Balance

Answer: B

46. **Damage to the periaqueductal gray matter would impair:**

A. Pain suppression

B. Respiration

C. Eye movement

D. Hearing

Answer: A

47. **The inferior olivary nucleus sends input to the:**

A. Thalamus

B. Cerebellum

C. Basal ganglia

D. Hippocampus

Answer: B

48. **Pontine nuclei relay motor information between the:**

A. Cortex and thalamus

B. Cortex and cerebellum

C. Spinal cord and brainstem

D. Basal ganglia and cerebellum

Answer: B

49. **The medial longitudinal fasciculus coordinates:**

A. Head and eye movements

B. Limb proprioception

C. Pain pathways

D. Sleep-wake cycles

Answer: A

50. **A patient with medial medullary syndrome would have deficits in:**

A. Facial sensation

B. Tongue movement

C. Arm strength

D. Visual fields

Answer: B

Diencephalon & Limbic System (10 Questions)

51. **The suprachiasmatic nucleus (SCN) regulates:**

A. Hunger

B. Circadian rhythm

C. Thirst

D. Body temperature

Answer: B

52. **Damage to the ventroposterior thalamic nucleus impairs:**

A. Motor planning

B. Somatic sensation

C. Vision

D. Emotion

Answer: B

53. **The hypothalamus controls all EXCEPT:**

A. Body temperature

B. Hunger

C. Voluntary movement

D. Thirst

Answer: C

54. **The hippocampus is critical for:**

A. Fear response

B. Memory consolidation

C. Olfactory processing

D. Sleep regulation

Answer: B

55. **Korsakoff's syndrome is associated with damage to the:**

A. Amygdala

B. Hippocampus

C. Dorsomedial thalamus

D. Hypothalamus

Answer: C

56. **The amygdala is primarily involved in:**

A. Reward processing

B. Fear and anxiety

C. Motor coordination

D. Language production

Answer: B

57. **Melatonin is secreted by the:**

A. Pineal gland

B. Pituitary gland

C. Hypothalamus

D. Thalamus

Answer: A

58. **A lesion in the habenular nuclei would most affect:**

A. Olfaction-emotion linkage

B. Circadian rhythm

C. Motor coordination

D. Pain perception

Answer: A

59. **The anterior thalamic nuclei relay information to the:**

A. Limbic system

B. Motor cortex

C. Visual cortex

D. Brainstem

Answer: A

60. **Stimulation of the lateral hypothalamus causes:**

A. Satiety

B. Hunger

C. Thirst

D. Sleep

Answer: B

Cerebral Cortex (10 Questions)

61. **Wernicke’s area is responsible for:**

A. Speech production

B. Language comprehension

C. Motor planning

D. Face recognition

Answer: B

62. **The angular gyrus links visual input to:**

A. Motor execution

B. Language processing

C. Emotional responses

D. Memory consolidation

Answer: B

63. **A patient with damage to the right parietal lobe would likely have difficulty with:**

A. Language production

B. Spatial awareness

C. Face recognition

D. Hearing

Answer: B

64. **Broca’s aphasia is characterized by:**

A. Fluent but nonsensical speech

B. Non-fluent speech with intact comprehension

C. Impaired comprehension

D. Inability to read

Answer: B

65. **The prefrontal cortex is critical for:**

A. Reflex arcs

B. Working memory

C. Pain modulation

D. Basic motor control

Answer: B

66. **Split-brain syndrome results from damage to the:**

A. Corpus callosum

B. Anterior commissure

C. Hippocampus

D. Thalamus

Answer: A

67. **The limbic association area integrates:**

A. Motor commands

B. Emotional processing

C. Visual stimuli

D. Auditory signals

Answer: B

68. **Alexia (inability to read) is caused by lesions in the:**

A. Angular gyrus

B. Broca’s area

C. Wernicke’s area

D. Primary visual cortex

Answer: A

69. **The dominant hemisphere for language in most individuals is the:**

A. Right

B. Left

C. Frontal

D. Occipital

Answer: B

70. **A patient with prosopagnosia cannot:**

A. Recognize faces

B. Produce speech

C. Understand language

D. Coordinate movement

Answer: A

Cerebellum (10 Questions)

71. **The lateral cerebellar zone is connected to the:**

A. Vestibular nuclei

B. Motor planning centers in the cortex

C. Spinal cord

D. Medulla reticular formation

Answer: B

72. **Dentate nucleus output primarily targets the:**

A. Thalamus

B. Red nucleus

C. Spinal cord

D. Hypothalamus

Answer: A

73. **Damage to the flocculonodular lobe causes:**

A. Dysmetria

B. Ataxia during rapid movement

C. Intention tremor

D. Dysarthria

Answer: B

74. **Climbing fibers originate from the:**

A. Inferior olivary nucleus

B. Pontine nuclei

C. Vestibular nuclei

D. Reticular formation

Answer: A

75. **Purkinje cells release:**

A. Glutamate

B. GABA

C. Dopamine

D. Acetylcholine

Answer: B

76. **The cerebellum compares intended movement with actual movement via:**

A. Efference copy from the ventral spinocerebellar tract

B. Feedback from muscle spindles

C. Input from the basal ganglia

D. Visual cortex signals

Answer: A

77. **A patient with dysdiadochokinesia has difficulty with:**

A. Rapid alternating movements

B. Balance during standing

C. Speech articulation

D. Muscle tone regulation

Answer: A

78. **The vestibulocerebellum primarily regulates:**

A. Posture and equilibrium

B. Limb coordination

C. Motor planning

D. Eye tracking

Answer: A

79. **Mossy fibers synapse on:**

A. Purkinje cells

B. Granule cells

C. Basket cells

D. Deep cerebellar nuclei

Answer: B

Brain Activity, Sleep, EEG & Epilepsy (10 Questions)

1. **Which neurotransmitter is released by the Raphe nuclei to promote sleep?**

   A. Acetylcholine

   B. Dopamine

   C. Serotonin

   D. Glutamate

   Answer: C

2. **The reticular activating system (RAS) is NOT activated by:**

   A. Pain

   B. Visual stimuli

   C. Olfactory stimuli

   D. Auditory stimuli

   Answer: C

3. **EEG beta waves are most characteristic of:**

   A. Deep sleep

   B. Relaxed wakefulness with eyes closed

   C. Active mental work

   D. REM sleep

   Answer: C

4. **During REM sleep, which of the following occurs?**

   A. Increased muscle tone

   B. Regular heart rate

   C. Vivid dreaming

D. Delta wave dominance

Answer: C

5. **A patient experiences brief episodes of staring and eyelid fluttering without loss of postural control. This describes:**

A. Tonic-clonic seizure

B. Absence seizure

C. Complex partial seizure

D. Myoclonic seizure

Answer: B

6. **The thalamocortical system is critical for maintaining:**

A. Reflex arcs

B. Consciousness

C. Muscle tone

D. Respiratory rhythm

Answer: B

7. **Which structure regulates circadian rhythm via melatonin secretion?**

A. Suprachiasmatic nucleus (SCN)

B. Pineal gland

C. Hypothalamus

D. Amygdala

Answer: B

8. **Decerebrate rigidity is caused by loss of cortical input to the:**

A. Medullary reticular nuclei

B. Pontine reticular nuclei

C. Red nucleus

D. Vestibular nuclei

Answer: B

9. **A paradoxical EEG pattern (similar to wakefulness) is seen in:**

A. NREM Stage 3

B. REM sleep

C. Coma

D. Seizure aura

Answer: B

10. **Generalized seizures most often propagate through:**

A. Corpus callosum

B. Thalamocortical loops

C. Basal ganglia circuits

D. Cerebellar pathways

Answer: B

Cerebellum (10 Questions)

11. **Dysmetria is characterized by:**

A. Inability to perform rapid alternating movements

B. Slurred speech

C. Overshooting or undershooting a target

D. Loss of balance during standing

Answer: C

12. **The dentate nucleus primarily sends output to the:**

A. Thalamus

B. Red nucleus

C. Spinal cord

D. Vestibular nuclei

Answer: A

13. **Climbing fibers originate from the:**

A. Inferior olivary nucleus

B. Pontine nuclei

C. Vestibular nuclei

D. Reticular formation

Answer: A

14. **Purkinje cells release which neurotransmitter?**

A. Glutamate

B. GABA

C. Dopamine

D. Serotonin

Answer: B

15. **A lesion in the flocculonodular lobe causes:**

A. Dysarthria

B. Ataxia during rapid movement

C. Intention tremor

D. Hemiballismus

Answer: B

16. **The cerebellum adjusts muscle force by comparing intended movement with:**

A. Visual feedback

B. Efference copy from motor commands

C. Basal ganglia output

D. Sensory cortex input

Answer: B

17. **The lateral cerebellar zone is involved in:**

A. Postural control

B. Planning sequential movements

C. Limb coordination

D. Eye tracking

Answer: B

18. **Mossy fibers synapse directly onto:**

A. Purkinje cells

B. Granule cells

C. Basket cells

D. Deep cerebellar nuclei

Answer: B

19. **A patient with cerebellar damage would exhibit:**

A. Resting tremor

B. Intention tremor

C. Chorea

D. Rigidity

Answer: B

20. **The spinocerebellum (intermediate zone) primarily coordinates:**

A. Axial muscle tone

B. Distal limb movements

C. Motor planning

D. Visual reflexes

Answer: B

Note: These questions emphasize high-yield concepts from the final two lectures, integrating anatomy, function, and clinical correlates.