Choose the best possible answer! Questions are 2 points each

Name Last ________________, First ________________, SID#______________

1.) What is unique about the definition of Biopsychology/Behavioral Neuroscience presented in class?
   A.) It requires the study of the structure and chemical basis of the nervous system.
   B.) It requires the study of functions and activities of the nervous system.
   C.) It requires the study of structure, function, chemical, cellular and systems level mechanisms of the nervous system.
   D.) It requires the study of behavior only.

2.) What does the Psychological approach lack when studying behavior?
   A.) This approach does not identify the molecular and cellular components of the nervous system associated with a specific behavioral response.
   B.) It lacks the ability to associate experience with behavior.
   C.) The Psychological approach is unable to identify neuronal systems responsible for producing a particular behavioral output.
   D.) Both A and C are true.

3.) True or False can the Neurobiological approach truly explain what physical components constitute behavior.
   A.) True
   B.) False

4.) There are several problems associated with studying the system-cellular-molecular components that constitute behavior. What are the ones discussed in class?
   A.) Skull
   B.) Blood-Brain-Barrier
   C.) Available tools and Methods
   D.) All the above

5.) fMRI is good for what?
   A.) It shows function with excellent spatial resolution.
   B.) It shows function with excellent temporal resolution.
   C.) It shows only structure.
   D.) It shows function with poor spatial resolution.

6.) What can be concluded about an ADHD patient’s prefrontal cortex using an fMRI?
   A.) The prefrontal cortex is hyperactive.
   B.) The prefrontal cortex is engaged.
   C.) The prefrontal cortex is not engaged.
   D.) The prefrontal cortex is not a region of interest.
7) Which of the following methods of disengagement would be useful for studying behavior?
   A.) Pharmacological agents locally infused to a specific brain region.
   B.) Complete brain ablation.
   C.) Systemic pharmacological treatment and/or micro-lesions to specific brain regions.
   D.) Both A and C are correct.

8.) What can be manipulated (Independent variable) in a formal neurobiological experiment?
   A.) The experience.
   B.) The experience and molecular-cellular-system level components of the CNS.
   C.) Both Behavior and experience.
   D.) Only the response

9.) Immunohistochemistry (IHC) and in-situ hybridization (ISH) assays are used to measure
phenotypic experience dependent changes in ____________.
   A.) protein activity; gene activity.
   B.) molecular activity cellular activity.
   C.) intracellular (inside neurons) activity; intercellular (between neurons) activity.
   D.) protein activity; antigen activity.

10.) To study the neurobiological constructs (molecular/cellular/system level activity) of
behavior, researchers use a 3D coordinate system to target specific brain regions for surgical
manipulation. What are the tools and/or land marks used for accuracy?
   A.) Brain atlas.
   B.) The anatomical points on the skull called Bregma and Lambda.
   C.) Sterotaxic instruments, the anatomical points on the skull (e.g. Bregma) and a brain
atlases.
   D.) A and B

11.) In Immunohistochemistry (IHC), __________ binds to __________?
   A.) antibody; antigen
   B.) protein; cell
   C.) antigen; protein
   D.) antibody; tissue

12.) The Somatic nervous system sends **sensory** information through what portion of the spinal
cord?
   A.) Dorsal root ganglion.
   B.) White matter.
   C.) Thalamus.
   D.) Dorsal.

13.) What is the similar between the Autonomic and Somatic Nervous system?
   A.) They are encased in bone.
   B.) Both are composed of sensory and motor projections.
   C.) Both contain nerve projections.
   D.) Nothing is similar.
14.) Which preganglionic neurotransmitter(s) are used by both the Sympathetic and Parasympathetic nervous system?
   A.) Acetylcholine
   B.) Norepinephrine
   C.) Both Acetylcholine and Norepinephrine
   D.) Dopamine

15.) Somatic sensory projections travel through what portion of the spinal column _______ and have cell bodies located in the _________.
   A.) Ventral medial; ventral ganglion.
   B.) Dorsal; sympathetic chain.
   C.) Both ventral/dorsal; dorsal root ganglion.
   D.) Dorsal; dorsal root ganglion.

16.) What type information is projected through the Ventral portion of the spinal cord?
   A.) Sensory and Motor tracts.
   B.) Cardiac and skeletal muscle efferent Motor nerves.
   C.) Skeletal muscle efferent motor tracts.
   D.) Afferent motor tracts.

17.) Cerebral-spinal fluid (CSF) can be found between which two meninges layers?
   A.) Dura mater and arachnoid layer
   B.) Pia mater and arachnoid layer
   C.) Dura mater and skull.
   D.) Pia mater and dura mater

18.) The BBB blocks ____________, but does not block___________?
   A.) all molecules; all infections
   B.) infections; all molecules
   C.) all drugs; all molecules
   D.) all molecules; all drugs

19.) CSF is produced in _____________ and is also produced by ____________,
   A.) Only the 3rd ventricle; the Choroid plexus.
   B.) the Choroid plexus; the ventricles
   C.) the ventricles; the Choroid plexus
   D.) all ventricles; the Choroid plexus

20.) True or False Neurons, glial and epithelial are all cells found in the CNS.
   A.) True
   B.) False
21.) In figure 1, what is the fissure that divides lobe 1 from lobe 2?
   A.) Central fissure.
   B.) Longitudinal fissure.
   C.) Hemispheric fissure.
   D.) Lateral fissure.

22.) In figure 1, what is this view of brain?
   A.) Dorsal
   B.) Ventral
   C.) Anterior to posterior
   D.) Lateral

23.) In figure 1, what lobe(s) is posterior to the central fissure and dorsal to the temporal lobe?
   A.) 1 and 3
   B.) 3
   C.) 5
   D.) 4 and 3

24.) In figure 1, Z best refers to what structure ____________?
   A.) Premotor cortex
   B.) Post-central gyrus
   C.) Primary sensory sulcus
   D.) Pre and post motor gyrus

25.) The sensory relay information of the Cuneatus and Gracilis nuclei are found where?
   A.) Midbrain of the medulla
   B.) Hindbrain of the metencephalon
   C.) Hindbrain of the Myelencephalon
   D.) Mesencephalon
26.) Which of the following structures is located in the **central nervous system**?

A) the optic tract.
B) the vagus nerve.
C) the celiac ganglia.
D) the optic nerve.

27.) **After a large meal**, which of the following systems do you think would be **most active** in your nervous system?

A) the sympathetic nervous system.
B) the parasympathetic nervous system.
C) the vestibular system.
D) the primary motor cortex.

28.) In class, we have briefly discussed **neglect** or complete (or near) ignorance or disregard of one side of a patient's own body. Damage to which brain region is generally associated with this most interesting condition?

A) occipital cortex.
B) parietal cortex.
C) insular cortex.
D) frontal

29.) What structure is specifically important for motor learning?

A.) Prefrontal cortex
B.) Basal Ganglia
C.) Cerebellum
D.) Both B and C

30.) What forebrain area is involved in aggressive behavior?

A.) Medulla
B.) Limbic system
C.) Hippocampus
D.) Amygdala

31.) The Anterior association cortex is important for what?

A.) activating aggressive behavior.
B.) emotional behaviors
C.) stress regulation
D.) Auto pilot type of behaviors

32.) All sensory information (vision, touch, hearing and pain) must first be processed by what structure?

A.) Medulla.
B.) The appropriate primary cortex.
C.) Thalamus.
D.) Hypothalamus.
33.) What brain area is slow to develop in children, or, in other words, which area is underdeveloped in children and teenagers?
   A.) Amygdala.
   B.) Limbic and hippocampus.
   C.) Amygdala and prefrontal cortex.
   D.) prefrontal cortex.

Which number represents the nerve cell parts in the next three questions?

34.) Axon terminal? (A = 1, B = 5, C = 4 or D = 2)

35.) Axon hillock? (A = 1, B = 5, C = 4 or D = 2)

36.) Myelin sheet? (A = 1, B = 5, C = 4 or D = 3)

37.) In the picture above, what type of neuron based on structure is shown?
   A.) a bipolar neuron.
   B.) an astrocyte.
   C.) a multipolar neuron.
   D.) interneuron.

38.) Which of the following can you normally find in a nerve cell membrane?
   A.) G-proteins.
   B.) neurotransmitters.
   C.) microtubules.
   D.) lipid bilayer.
39.) Where is **deoxyribonucleic acid (DNA)** located in neurons?
   A.) axon hillock.
   B.) nucleus.
   C.) mitochondria.
   D.) cytoplasm.
   E.) synaptic vesicles.

40.) Which **compartment** of the neuron is normally responsible for the **initiation of the action potential**?
   A.) presynaptic terminal.
   B.) endoplasmic reticulum.
   C.) nucleus.
   D.) axon hillock.
   E.) dendrite.

41.) Myelination is produced by _______________ in the _______________
   A.) ependymal cells; central nervous system.
   B.) oligodendrocytes; peripheral nervous system.
   C.) astrocytes; peripheral nervous system.
   D.) Schwann cells; central nervous system.
   E.) oligodendrocytes; central nervous system.

42.) Neurons **communicate** with each other through what **specialized structure**?
   A.) synapse.
   B.) nodes of Ranvier.
   C.) dendrite.
   D.) axon.
   E.) soma.

43.) Which of the following **glial cells** is mostly responsible for **bringing nutrients to neurons**?
   A.) astrocytes.
   B.) oligodendrocytes.
   C.) microglia.
   D.) Schwann cells.
   E.) ependymal cells.

44.) Which **type** of neuron is more likely to contact and contract the muscle cells of your feet?
   A.) projection neurons.
   B.) motor neurons.
   C.) interneurons.
   D.) pseudounipolar neurons.
   E.) sensory neurons.
45.) The Cortex is primarily composed of grey matter organized into layers, what are the important functions of layers 1-3?
   A.) Process and integrate information from layer 4.
   B.) Process incoming information from thalamus only.
   C.) Process and output information back to the thalamus.
   D.) Process information form a particular primary cortex.

46.) What type of functional (according to definition) neurons are located in the layers of the Sensory Cortex?
   A.) Motor neurons
   B.) Interneurons
   C.) Pyramidal neurons
   D.) Multiplier neurons

47.) The neuron, like all cells, is composed of what intracellular (inside) organelles?
   A.) Macromolecules
   B.) Receptors
   C.) Proteins
   D.) Endoplasmic Reticulum

48.) What is the central dogma of biology?
   A.) Translate DNA and Transcribe proteins
   B.) Transcribe DNA and Translate RNA into functional proteins
   C.) Transcribe RNA and Translate RNA into functional proteins
   D.) Translate proteins and transcribe genes

49.) True or False Neurons and glial are specialized cells that conduct and transmit electrochemical signals.
   A.) True
   B.) False

50.) True or False, glial cells can greatly influence neuronal activity?
   A.) True
   B.) False

**Bonus Question (will not count against you)**

51.) I listed in class 4 basic neural systems specific for a certain neurotransmitter. Which has neuronal cells bodies in the Raphe Nucleus?
   A.) Norepinephrine neurons
   B.) Dopamine neurons
   C.) Serotonergic neurons
   D.) Cholinergic neurons