Fall 2011

**FINAL EXAM**

**VERY IMPORTANT - BEFORE YOU START THE EXAM:**
1) **Bubble in your name.**
2) **Bubble in your student number into the usual space.**
3) **There are two versions of this exam. You have version B. Before starting the exam, mark B on question 60.**
4) **MAKE SURE YOU PUT YOU EXAM IN THE CORRECT (VERSION B) PILE WHEN YOU FINISH!!**

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

1) The purpose of cognitive-behavioral therapy is to
   A) change the patient’s habitual reactions to troubling situations.
   B) change thinking patterns giving rise to a distorted (and negative view) of what’s going on in the patient’s life.
   C) reduce feelings of anxiety, depression or anger.
   D) both A and B
   E) all of the above

2) Which of the following are necessary to produce the sensations of a phantom limb?
   A) Reorganization of the somatosensory cortex.
   B) Increased input from the prefrontal cortex.
   C) Sprouting of collateral branches into the area of the somatosensory cortex that originally received input from the missing limb.
   D) All of the above
   E) A and C

3) The monoamine theory of depression is based on the fact that
   A) depressed people have low levels of monoamines.
   B) most drugs effective in the treatment of depression are monoamine agonists.
   C) depressed people have high levels of monoamines.
   D) most drugs effective in the treatment of depression are monoamine antagonists.
   E) both A and D

4) Severe ongoing neural degeneration is typically observed in the __________ of most schizophrenics.
   A) temporal cortex
   B) amygdalas
   C) frontal cortex
D) all of the above
E) none of the above

5) People with this disorder carry out particular (and sometimes peculiar) behaviors to reduce anxiety.
   A) generalized anxiety disorder
   B) obsessive-compulsive disorder
   C) schizophrenia
   D) panic disorder
   E) post-traumatic stress disorder

6) The portion of sleep time spent in REM sleep can be altered
   A) by sleep deprivation.
   B) by treatment with some antidepressants.
   C) by advancing brain development (age).
   D) all of the above
   E) B and C

7) Damage to the limbic system (E.g. hippocampus, amygdala, etc) can produce
   A) memory impairments.
   B) emotional disturbances.
   C) difficulties with voluntary movement.
   D) both A and B
   E) both B and C

8) Tourette syndrome is
   A) characterized by vocal tics.
   B) more common in males than females.
   C) characterized by motor tics.
   D) all of the above
   E) A and B

9) Action potentials originate
   A) in the area of the axon hillock, with the opening of voltage-activated sodium channels.
   B) at the terminal buttons, with the opening of voltage-activated sodium channels.
   C) in the area of the axon hillock, with the opening of voltage-activated potassium channels.
   D) at the terminal buttons, with the opening of voltage-activated potassium channels.
   E) none of the above

10) Many chemicals (good and bad) are kept from passing from the circulatory system of the CNS into brain tissue by
    A) reflexology.
    B) the cerebrospinal fluid.
C) the blood-brain barrier.
D) tolerance.
E) withdrawal.

11) The fovea of the eye can resolve fine detail because
A) there is high convergence of cones to retinal ganglion cells.
B) there is high convergence of rods to retinal ganglion cells.
C) there is low convergence of cones to retinal ganglion cells.
D) there is low convergence of rods to retinal ganglion cells.

12) Depression is often divided into two categories: reactive depression and __________ depression.
A) endogenous
B) acute
C) unipolar
D) bipolar
E) chronic

13) Which of the following is not true of myelin?
A) It covers portions of the axon that do not have the voltage-sensitive sodium channels needed for regeneration the action potential.
B) It can be disrupted by Multiple Sclerosis
C) It forms the blood brain barrier.
D) It is formed by oligodendrocytes and Schwann cells.
E) It increases the speed with which an action potential travels down an axon.

14) Which of the following is a symptom of posttraumatic stress disorder?
A) Blunted arousal in response to a sudden loud noise.
B) Difficulty sleeping and poor concentration.
C) Avoidance of troubling places and situations.
D) both A and B
E) both B and C

15) Reserpine (the active ingredient in the Snake Root Plant) is not currently used in the treatment of schizophrenia because it
A) is an anxiolytic.
B) violates the dopamine theory of schizophrenia.
C) is ineffective.
D) can produce a dangerous decrease in blood pressure.
E) is an antihistamine.

16) Which of the following disorders has a genetic component?
A) Tourette’s syndrome
B) bipolar disorder
C) generalized anxiety disorder
D) both A and B
Disorders characterized by persistent feelings of anxiety and a variety of stress responses in the absence of an apparent precipitating stimulus are classified as
A) tachycardia.
B) obsessive-compulsive disorders.
C) phobic anxiety disorders.
D) generalized anxiety disorders.
E) panic attacks.

H.M, the most thoroughly-studied amnesiac in history,
A) could not form implicit memories.
B) did not have a short-term memory.
C) could not consolidate long-term memories.
D) had severe amnesia for early events in his life.
E) all of the above

Phobias
A) are characterized by frequently recurring, uncontrollable anxiety-producing thoughts and compensatory responses
B) are often treated with systemic desensitization.
C) are caused by exposure to a specific object or situation.
D) all of the above
E) B and C

A neuron in the central nervous system can receive thousands of synaptic inputs onto its dendrites. Which of the following is (are) true of these contacts?
A) Neurotransmitters released from the presynaptic terminal buttons bind to receptors on the dendrites to produce EPSPs and IPSPs.
B) Each of these synaptic contacts produces an action potential in the postsynaptic neuron.
C) All of the synaptic contacts are all excitatory.
D) B and C.
E) All of the above.

Symptoms such as blunt affect, catatonia, and poverty of speech are
A) negative symptoms of dementia.
B) negative symptoms of affective disorder.
C) positive symptoms of dementia.
D) positive symptoms of schizophrenia.
E) negative symptoms of schizophrenia.

In a neuron, the axon carries __________ information away from the soma, while the dendrites receive __________ information from other neurons.
A) afferent; efferent
B) efferent; afferent
23) MAO inhibitors are no longer commonly used in the treatment of depression because
   A) they can produce rebound mania.
   B) in combination with certain foods, they can produce dangerous increases in blood pressure.
   C) they produce severe indigestion.
   D) they are ineffective against depression.
   E) both A and B

24) Lithium has often been used as a treatment for
   A) cocaine psychosis.
   B) generalized anxiety.
   C) bipolar affective disorder.
   D) schizophrenia.
   E) unipolar affective disorder.

25) Women are at least twice as likely as men to be diagnosed with
   A) bipolar disorder.
   B) depression.
   C) schizophrenia.
   D) Tourette’s Syndrome.
   E) all of the above

26) Benzodiazepines (Ex. Valium)
   A) are monoamine agonists.
   B) bind to GABA receptors.
   C) are GABA antagonists.
   D) both A and B
   E) both A and C

27) With respect to neurotransmitters, which of the following is a correct sequence?
   A) reuptake, synthesis, deactivation, exocytosis
   B) deactivation, postsynaptic binding, synthesis, storage in vesicles
   C) synthesis, storage in vesicles, exocytosis, reuptake
   D) storage in vesicles, deactivation, synthesis, exocytosis
   E) exocytosis, postsynaptic binding, synthesis, reuptake

28) Which of the following is not a common symptom of schizophrenia?
   A) weak social interactions
   B) severe involuntary tics
   C) auditory hallucinations
   D) incoherent thought
   E) delusions

29) Which of the following is the most common psychological disorder?
   A) bipolar disorder
30) Which of the following can produce substance-induced psychosis, with symptoms (hallucinations and delusions) that resemble those of schizophrenia?
   A) dopamine agonists
   B) cocaine
   C) PCP (angel dust)
   D) amphetamine
   E) all of the above

31) Primates generally find their food by sight; mice use their noses. What would you predict about their brains?
   A) Primates will have a larger proportion of their brains devoted to processing visual information than mice will.
   B) Primates will have a smaller proportion of their brains devoted to processing visual information than mice will.
   C) Mice will have a larger proportion of their brains devoted to processing olfactory information than primates will.
   D) A and C
   E) B and C

32) Symptoms of this sleep disorder include trouble falling asleep and staying asleep.
   A) sleep apnea
   B) narcolepsy
   C) restless leg syndrome
   D) insomnia
   E) somnambulism

33) Currently available antidepressants work by increasing the availability of serotonin, dopamine and norepinephrine in the synapse. They can do this by:
   A) blocking the reuptake of serotonin, dopamine and norepinephrine.
   B) blocking the enzyme that breaks down serotonin, dopamine and norepinephrine into inactive chemicals.
   C) increasing flow of cerebral spinal fluid through the brain
   D) A and B
   E) A and C

34) The best evidence that environmental factors play a role in the etiology of schizophrenia is that
   A) the disorder is more common amongst cocaine users.
   B) the disorder is more common in males than in females.
   C) the concordance rate for siblings is much less than 100%.
   D) the concordance rate for identical twins is much less than 100%.
E) none of the above

35) You see a mountain lion! The mountain lion sees you !!! Your heart rate is increased by excitatory signals from the
A) cerebellum.
B) the parasympathetic nervous system.
C) somatic nervous system.
D) sympathetic nervous system.
E) enteric nervous system.

36) Which of the following early experiential factors have been implicated in some cases of schizophrenia?
A) infections
B) stress
C) prenatal trauma
D) A and B
E) all of the above

37) In the peripheral nervous systems of higher vertebrates, regenerating axons often are guided to their target cells by
A) microglia.
B) astrocytes.
C) interneurons
D) stem cells.
E) Schwann-cell sheaths.

38) The difference in electrical charge between the inside and the outside of a neuron at rest is
A) a way of priming the neuron to respond rapidly to incoming information.
B) called the resting membrane potential
C) produced by myelin.
D) A and B
E) B and C

39) Which of the following is not true of the NMDA receptor?
A) Its activation requires the binding of glutamate and the partial depolarization of the post-synaptic membrane.
B) It is a subtype of glutamate receptor.
C) It is particularly important for some types of learn and memory-related synaptic plasticity (ex. some forms of LTP)
D) Its activation opens an ion channel in the membrane.
E) It is a type of acetylcholine receptor.

40) Strokes occur when the blood flow in the brain is compromised by:
A) death of adjacent neurons.
B) hemorrhage.
C) blockage of a blood vessel.
D) A and C
E) B and C

41) The behavioral symptoms of schizophrenia typically appear in
   A) middle age.
   B) adolescence or early adulthood.
   C) infancy.
   D) childhood.
   E) old age.

42) A concussion
   A) usually results from a hemotoma.
   B) can be caused by ischemia.
   C) is a disturbance of consciousness with no evidence of contusion or other structural damage.
   D) both A and B.
   E) both A and C.

43) This technique provides images of brain activity by utilizing the increased uptake of glucose by active neurons.
   A) positron emission tomography (PET)
   B) functional magnetic resonance imaging ((fMRI)
   C) computerized tomography (CT)
   D) magnetoencaphalography (MEG)
   E) contrast X-rays

44) Multipolar neurons
   A) are often involved in integrating incoming information and transmitting it locally
   B) are specialized to receive information from the brain and send it rapidly into the muscles
   C) typically have lots of axons and no dendrites.
   D) A and B
   E) B and C

45) Errors of refraction (failure to correctly focus light on the retina) can occur if the
   A) eyeball is too short or too long.
   B) cornea is too curved, or is uneven (Astigmatism).
   C) lens is losing its elasticity due to aging.
   D) A and C.
   E) All of the above.

46) Many drugs and toxins exert their effects on the nervous system by
A) activating the cerebellum.
B) altering the functioning of ion channels.
C) mimicking, prolonging, or blocking the action of a neurotransmitter.
D) all of the above
E) B and C

47) Chlorpromazine (Thorazine), one of the drugs first used to treat schizophrenia, binds to dopamine receptors without activating them, and keeps dopamine from binding to them. Accordingly, chlorpromazine is classified as a
A) dopamine antagonist.
B) dopamine agonist.
C) dopamine receptor blocker.
D) both A and B
E) both A and C

48) Which of the following abnormalities are often observed in the brains of schizophrenics
A) some brain structures are abnormally small (e.g. the hippocampus).
B) disorganized arrangement of the neurons in the hippocampus
C) abnormally large ventricles.
D) all of the above
E) none of the above

49) Electroconvulsive therapy
A) can relieve depression more rapidly than antidepressants
B) is effective for the treatment of schizophrenia.
C) is often used to treat phobias.
D) can reduce the tics associated with Tourette syndrome.
E) none of the above.

50) Why do many neurobiologists believe that long-term potentiation (LTP) is good model of the type of mechanisms that underlie learning and memory?
A) Learning can produce LTP-like effects in brain structures associated with memory.
B) Many drugs that influence learning and memory have very similar effects on LTP.
C) LTP can be evoked by patterns of electrical stimulation that mimic normal patterns of activity in the brain.
D) A and C
E) all of the above