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 A. Before starting the exam, mark A on question 60.
4) MAKE SURE YOU PUT YOU EXAM IN THE CORRECT (VERSION A) PILE WHEN YOU FINISH!!

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

1. A condition in which the patient sees well, but is unable to recognize the faces of familiar people is known as:
   A) astigmatism.
   B) prosopagnosia.
   C) presbyopia.
   D) hyperopia.

2. A person with mild, medial temporal lobe amnesia would have the most difficulty
   A) learning to swim.
   B) describing a recent visit with their grandmother.
   C) remembering how to play pool.
   D) solving a math equation.
   E) remembering their best friend from childhood.

3. The major contribution(s) of H.M.’s case include the following:
   A) It provided evidence of memory without conscious awareness.
   B) It effectively challenged the view that memory-related functions are diffusely and equivalently distributed throughout the brain.
   C) It was the first to strongly implicate the medial temporal lobes in memory.
   D) It provided support for the view that there are distinct modes of short-term and long-term storage.
   E) all of the above

4. Patients with medial temporal lobe amnesia can form
   A) short-term memories.
   B) implicit memories.
   C) declarative memories.
   D) both A and B
   E) all of the above
5. Which of the following would most likely be associated with the loss of childhood memories
   A) severe retrograde amnesia.
   B) mild retrograde amnesia
   C) mild anterograde amnesia
   D) severe anterograde amnesia

6. A patient with Korsakoff’s syndrome
   A) is likely to report memories that did not occur.
   B) suffers from brain damage produced by a form of malnutrition (often resulting from alcoholism).
   B) would have anterograde amnesia, but not retrograde amnesia
   D) both A and B.
   E) all of the above.

7. Which of the following task(s) rely on implicit memory?
   A) Pavlovian conditioning
   B) mirror drawing test
   C) semantic memories
   D) both A and B
   E) all of the above

8. An elderly patient demonstrating deficits in short-term memories, episodic memories, and some implicit memories would most likely be diagnosed with
   A) medial temporal lobe amnesia.
   B) Korsakoff’s syndrome.
   C) Alzheimer’s disease.
   D) post-traumatic amnesia.
   E) all of the above

9. The radial arm maze task can be used to test
   A) implicit memory.
   B) spatial memory.
   C) axonal regeneration.
   D) both A and B
   E) all of the above

10. Place cells
    A) are located in the hippocampus.
    B) become active when a rat is in a particular location within its environment.
    C) fire only when the rat is moving.
    D) both A and B
    E) all of the above

11. The Hebbian theory suggests that learning occurs when
A) pre- and postsynaptic neurons are simultaneously active.
B) there is unsynchronized activity in the brain.
C) place cells become active.
D) axons regenerate.
E) all of the above

12. The consolidation of episodic memories requires
   A) the hippocampus
   B) the cerebellum
   C) the suprachiasmatic nucleus
   D) both A and B
   E) all of the above

13. Long-term potentiation (LTP) is an enduring increase in the functional strength (efficacy) of
   A) neurons
   B) myelin
   C) action potentials
   D) synapses.

14. Many neuroscientists believe that long-term potentiation is a good model of the type of mechanisms likely to underlie learning and memory. Why?
   A) Many drugs that influence learning and memory have similar effects on LTP.
   B) LTP can be evoked by patterns of stimulation that mimic normal neural activity in the brain.
   C) Learning can produce LTP-like increases in synaptic efficiency in brain structures associated with memory.
   D) A and C
   E) all of the above

15. How does post-traumatic amnesia provide evidence for the theory of memory consolidation?
   A) Recent memories are disrupted following a blow to the head while older, remote memories generally remain intact.
   B) The duration of the amnesia is based on the severity of the blow to the head.
   C) A concussion only causes retrograde amnesia without causing anterograde amnesia.
   D) Only explicit memories are disrupted, while implicit memories remain intact.
   E) Only episodic memory is disrupted, while semantic memories remain intact.

16. Which of the following is not true of the AMPA receptor?
   A) Its activation allows Na+ to enter the neuron.
B) It is an ionotropic receptor.
C) It is a sub-type of glutamate receptor.
D) Its activation requires that the membrane be partially depolarized.
E) None of the above.

17. The NMDA receptor is a type of ________ receptor.
   A) GABA
   B) serotonin
   C) glutamate
   D) dopamine
   E) metabotropic

18. A fairly common cause of a cerebral hemorrhage is
   A) an embolism.
   B) a bursting aneurysm
   C) arteriosclerosis.
   D) both A and B
   E) all of the above

19. An embolism occurs when blood flow is blocked
   A) at the site of the blood clot formation.
   B) after a blood clot has traveled from its origin and lodged in a smaller blood vessel.
   C) after the walls of a blood vessel thickens due to fat deposits.
   D) after a blood vessel ruptures.
   E) after a hemotoma forms near the site of a rupture blood vessel.

20. Uncle Bill had a stroke, but the doctor says she can't predict Uncle Bill’s outcome for a few days. Given what you've learned in this class, what’s the best explanation for the delay?
   A) The doctor doesn’t know how Uncle Bill will adjust to his hypertension medication.
   B) The doctor can't do a CT scan on Uncle Bill for a few days because it might exacerbate his condition.
   C) The damage of a stroke is often not limited to the initial injury; excitotoxic damage can spread outward from the injury.
   D) The damage of a stroke depends on whether it was an embolism or a thrombosis and the doctor can’t tell that for a few days.
   E) A and B

21. Which of following treatments may help prevent brain damage following a stroke?
   A) Stimulating excitatory synapses.
   B) Mild hypothermia.
   C) Blocking inhibitory synapses with a GABA antagonist
   D) both A and B
22. Contusions
   A) cause temporary disruption of cerebral function without any observable structural brain damage.
   B) occur when the brain slams against the inside of the skull.
   C) frequently occur in the brain opposite of the site of a blow to the head.
   D) both A and B
   E) both B and C

23. Chronic Traumatic Encephalopathy
   A) is a progressive neurodegenerative that can lead to dementia
   B) is linked to multiple blows to the head
   C) is very incompletely understood
   D) can lead to light-headedness, depression, memory impairment, emotional instability and erratic behavior
   E) all of the above

24. Polio was particularly devastating because
   A) the virus preferentially attacks motor neurons.
   B) it often infected children and young adults.
   C) there was no effective vaccine to prevent it until about 60 years ago.
   D) all of the above
   E) none of the above

25. The phrase "Mad Hatter" originally referred to people suffering from cognitive problems associated with
   A) polio.
   B) mercury poisoning.
   C) syphilis.
   D) lead poisoning.
   E). tardive dyskinesia

26. Which of the following brain disorders results from a genetic mutation that produces an extra chromosome 21?
   A) Down syndrome
   B) meningitis
   C) multiple sclerosis
   D) general paresis
   E) tardive dyskinesia

27. The degeneration of axons sometimes causes undamaged axons near by to sprout _______ that grow to the synaptic sites that have been abandoned by the degenerating axons.
   A) phagocytes
   B) collateral branches
C) dendritic spines
D) Schwann cells
E) nodes of Ranvier

28. Following damage to an axon, retrograde degeneration may occur. This specifically refers to
   A) degeneration of the axon (and the possibly cell body) proximal to the damage.
   B) degeneration of the distal axon and associated presynaptic terminals.
   C) degeneration of neurons that make synaptic connection with the damaged neuron.
   D) degeneration of the damaged neuron's nucleus.

29. If the myelin sheaths made up of Schwann cells are slightly separated in a damaged nerve,
   A) individual axons can usually regenerate to their correct targets.
   B) individual axons may regenerate, but toward incorrect targets.
   C) axons do not typically achieve functional regeneration.
   D) only the distal axon segments regenerate toward their correct target.
   E) axons are always released from inhibition.

30. Myelin sheaths help promote axonal growth in the PNS because
   A) they make growth factors.
   B) they make new neurons.
   C) they completely block excitotoxicity.
   D) all of the above

31. Embryonic stem cells are multipotent, meaning they can develop into
   A) neurons.
   B) astocytes.
   C) ependyma cells.
   D) both A and B
   E) all of the above

32. Fetal substantia nigra tissue has been used in the treatment of
   A) Alzheimer’s disease
   B) Parkinson’s disease
   C) ischemia
   D) both A and B
   E) none of the above

33. Ramachandran found that the experience of having a phantom limb did not come from the nerves of the amputated limb, but rather from the
   A) neural reorganization in the somatosensory cortex
   B) neural reorganization in the motor cortex.
   C) nerves in contralateral limb.
D) nerves in the ipsilateral limb.
E) nerves in the stump of the amputated limb.

34. Circadian means
   A) once a day.
   B) twice week.
   C) every night.
   D) weekly.
   E) happening twice in one day.

35. External cues (such as the rising of the sun) that animals use to establish daily rhythms are known as:
   A) phase shifts.
   B) **zeitgebers.**
   C) entrainment phases.
   D) circadian rhythms.
   E) None of the above.

36. If a company needs to send representatives to an important meeting two or more time zones to the east and wants them at their best, it would be best dispatch them
   A) as the meeting begins
   B) for as short a time as possible
   C) **a day or two before the meeting.**
   D) in the middle of the night.

37. Adolescents often:
   A) require less sleep than at people at other points in the lifespan.
   B) continue their normal patterns of sleep and waking.
   C) **like to stay up and sleep late.**
   D) like get up early.

38. The suprachiasmatic nucleus
   A) is the body's master clock.
   B) receives information about light from the retinohypothalamic pathway.
   C) creates molecular signals that tell an animal when to wake up.
   D) **A and B**
   E) B and C

39. Human growth hormone is typically secreted during
   A) Stages 1 and 2 of sleep.
   B) **Stages 3 and 4 Slow Wave Sleep.**
   C) studying.
   D) prolonged wakefulness.
   E) REM sleep.
40. Under normal circumstances, which portion of a night’s sleep contains the greatest percentage of stage 4 sleep?
   A) **the early part of the night**
   B) the middle of the night
   C) the end of the night
   D) the amount of stage 4 sleep is constant across the night.

41. REM sleep is characterized by
   A) **rapid eye movement.**
   B) a pattern of brain activity resembling that seen during deep, slow wave sleep.
   C) normal muscle tone.
   D) night terrors.
   E) relatively slow, synchronized brain waves with a large amplitude.

42. In comparison to dreams during slow-wave sleep, REM dreams are
   A) move vivid
   B) story-like
   C) longer
   D) **all of the above**

43. Nightmares occur during
   A) **REM sleep**
   B) Stage 1 sleep
   C) slow wave sleep
   D) both A and B
   E) all of the above

44. Species that sleep a lot tend to
   A) be more active.
   B) have higher body temperatures.
   C) be large.
   D) **be less vulnerable to predation when they sleep.**
   E) none of the above

45. If you were awakened every time you entered REM sleep for a few nights, then permitted to sleep without interruption, you would
   A) **spend more time than normal in REM sleep.**
   B) get nothing but REM sleep for the next few nights.
   C) get little REM sleep for the next few nights.
   D) spend about the same time in REM sleep as usual.

46. Professor Somnolent sometimes falls asleep while he is giving a lecture. He would likely be diagnosed as having
   A) **narcolepsy.**
   B) epilepsy.
47. What does cataplexy involve?
   A) dream-like experiences that can be hard to distinguish from reality.
   B) **loss of core muscle tone while awake.**
   C) a lack of inhibition of movement during REM sleep.
   D) repeated involuntary movements of the legs during sleep.

48. Which of the following statements about sleepwalking is true?
   A) It occurs most commonly in adults.
   B) It is dangerous to awaken a sleepwalker.
   C) **It tends to run in families.**
   D) Sleep walkers are acing out a dream.

49. Actual cessation of breathing followed by partial waking and gasping for air is characteristic of:
   A) insomnia.
   B) somnambulism.
   C) **sleep apnea.**
   D) nocturnal enuresis.
   E) none of the above.

50. The fact that all birds and mammals sleep suggests that
   A) sleep serves an important physiological function in an number of species.
   B) people should sleep as much as they can.
   C) sleep serves a particularly important cognitive function in humans.
   D) both A and C
   E) both B and C