1. Which of the following is true regarding a relative frame of reference:
   a. It changes as objects in the scene move relative to each other
   b. It could be described as putting yourself in the objects’ point of view
   c. It does not vary as objects move
   d. It is talked about in terms that reference world directions (North, South, East, West)
   e. It changes as the observer moves

2. Which of the following cells fire when the animal is facing a certain direction relative to the environment?
   a. Place Cells
   b. Grid Cells
   c. Head Direction Cells
   d. Hippocampal Cells
   e. None of the above

3. The geometric structure of a network of neurons affects its____________
   a. Life cycle
   b. Function
   c. Blood flow
   d. Genetic expression
   e. None of the above

4. True or False. Apparent cortical thinning may be due to the continual myelination of axononal processes instead of the true loss of neuronal cell bodies in the brain.
   a. True
   b. False

5. Until the advent of modern neuroimaging techniques, it was (incorrectly) believed that by age ___, a child’s brain was basically mature.
   a. 5-6
   b. 11-12
   c. 1-2
   d. 17-18

6. The decline in infants’ ability to attend to the objects’ relationship to one another in terms that are not emphasized in their native language, as they age, is a pattern most similar to which of the following phenomenon?
   a. VOT and phoneme differentiation
   b. Embodied cognitive abilities
   c. Statistical language analysis
   d. Language lateralization
   e. Conduction aphasia

7. Which brain area is involved for path centered representations, according to Dr. Nitz?
   a. Parietal cortex
   b. Temporal lobe
   c. Frontal lobe
   d. None of the above
8. Spatial summation is
   a. The summation of both pre and post synaptic neurons
   b. A way to measure a neuron’s firing rate
   c. The summation of inputs from multiple presynaptic units along the dendritic tree.
   d. The summation of multiple inputs from one presynaptic neuron
   e. None of the above

9. Which of the following is true about head direction cells?
   a. Their neural response map out hexagonal patterns.
   b. They are solely located in the entorhinal cortex of the brain.
   c. The faster the animal is moving in a certain direction, the stronger the activity would be.
   d. The firing pattern is primarily tuned to the exact location in a certain environment.
   e. None of the above

10. In the juggler experiment discussed by Dr. Jernigan, a group of people were taught how to juggle through an intensive juggling course. The results of this experiment showed:
    a. The baseline readings of the brain remained constant and unchanging throughout the course of the experiment.
    b. The group that learned to juggle showed permanent change in FA signals in certain parts of the brain.
    c. The group that learned to juggle showed temporary increase of FA, only to diminish after several months of not practicing.
    d. The group that learned to juggle demonstrated neuroplasticity through increase of cortical thickness in the majority of the brain.
    e. None of the above

11. Which part of a neuron decides whether sufficient inputs have been received to initiate an action potential?
    a. Cell Body
    b. Axon
    c. Nucleus
    d. Initial Segment
    e. Synapse

12. Dr. Vul showed an animation of some shapes moving around on a screen (two triangles and a circle), and many students laughed. What was the point he was trying to illustrate?
    a. Our brain excels at making inferences based on very impoverished data
    b. Language is lateralized to the left hemisphere of the brain
    c. We have an amazing ability to recognize faces
    d. All of the above
    e. None of the above

13. Native speakers of Spanish and German, languages with grammatical gender, are asked to describe a bridge. Bridges are grammatically “male” in Spanish and grammatically “female” in German. Which of the following set of results is the most likely?
    a. The Spanish speaker will use mostly “male” adjectives, while the German speaker will use mostly “female” adjectives.
    b. The Spanish speaker will use mostly “female” adjectives, while the German speaker will use mostly “male” adjectives.
    c. Both speakers will use mostly “male” adjectives.
    d. Both speakers will use mostly “female” adjectives.
    e. None of the above.
14. Which of the following sentences is an example of incorrect deductive reasoning?
   a. All of my jackets are brown. I am wearing one of my jackets. Therefore, the jacket I am wearing is brown.
   b. Peter owns a black dog. I see a black dog in my yard. Therefore, the dog in my yard is Peter’s.
   c. Children only cry when they are distressed. Martha’s son is crying. Therefore, Martha’s son is distressed.
   d. All of my friends like ice cream. Tom is one of my friends. Therefore, Tom likes ice cream.
   e. None of the above.

15. Linguistic relativity refers to
   a. How related our language is to our heritage and how it is demonstrated in our native cultures.
   b. The way in which our native languages shape the way we think.
   c. The way in which our language influences how we conceptualize our world.
   d. b and c
   e. None of the above

16. True or False. As a foreign-language speaker, the earlier you learn English as a second language, the more you will behave like an English speaker in spatial and temporal cognition tasks.
   a. True
   b. False

17. Diffusion tensor imaging is a technique for:
   a. Imaging brain response to different sensory stimuli
   b. Imaging the diffusion of molecules, for example water
   c. Imaging the size and direction of myelinated white matter tracts
   d. b and c
   e. All of the above

18. The Human Connectome Project ____.
   a. is a graphical interface that uses compiled data about the structure of the brain
   b. is the first large-scale attempt to collect and share data about the structure and function of the brain
   c. uses advanced neuroimaging methods to collect data from healthy individuals
   d. is designed to obtain and share material for educational purposes
   e. All of the above are correct statements.

19. Which of the following is NOT a cue used to for depth perception?
   a. Motion parallax
   b. Stereopsis
   c. Texture Gradient
   d. Occlusion
   e. Retinal convergence

20. True or False. Probabilistic models help to explain cognitive robustness in the face of noisy sensory information and internal uncertainty.
   a. True
   b. False

21. True or False. The neural architecture of the brain undergoes constant alteration, not just during childhood, but throughout adolescence and adulthood.
   a. True
   b. False
22. Which of the following is an example of probabilistic inference?
   a. Tradeoff between prior and evidence.
   b. Integrating multiple cues
   c. Explaining away
   d. Discounting and marginalization
   e. All of the above

23. Which of the following is true?
   a. Cerebral gray matter volume stays constant until old age, at which time it increases
   b. Cerebral gray matter volume decreases throughout one's lifetime
   c. Cerebral gray matter volume increases in early childhood, stays level through adulthood, and then starts to decline in old age
   d. Cerebral gray matter volume stays constant throughout one's lifetime
   e. None of the above

24. What structure keeps tracks of the output from head direction cells?
   a. Cingulate Cortex
   b. Hippocampus
   c. Area VIP
   d. Entorhinal Cortex
   e. None of the above

25. Hemi-neglect is most often associated with damage to the _____ parietal cortex and is associated with neglect of the _____ visual field. Hemi-neglect ______ also apply to object space.
   a. left; left; does
   b. right; right; does not
   c. left; right; does not
   d. right; left; does
   e. None of the above

26. Among Marr's levels of analysis, which is involved in how the system is physically realized (e.g. neuronal circuitry in the brain)?
   a. Behavioral
   b. Computational
   c. Environmental
   d. Implementational
   e. Algorithmic

27. Which of the following is true?
   a. Effective connectivity refers to a reverse relationship between different brain regions and functional connectivity refers to a causal relationship
   b. Effective connectivity refers to a causal relationship between different brain regions and functional connectivity refers to a correlational relationship.
   c. Effective connectivity refers to a causal relationship between different brain regions and functional connectivity refers to a reverse relationship.
   d. Effective connectivity refers to a reverse relationship between different brain regions and functional connectivity refers to a causal relationship.
   e. Effective connectivity refers to a correlational relationship between different brain regions and functional connectivity refers to a causal relationship.
28. True or False. English speakers tend to perform quicker on spatial and temporal cognition tasks when they have been exposed to vertical priming while Chinese speakers perform quicker after horizontal priming.
   a. True
   b. False

29. While head direction cells, place cells, and grid cells all help orient the self in an environment, which of these cells is sensitive to rotation of the environment?
   a. Head direction cells
   b. Place cells
   c. Grid cells
   d. None of them is sensitive to rotation of the environment.
   e. All of them are sensitive to the rotation of the environment.

30. The Sapir-Whorf Hypthesis claims:
   a. The language you immerse yourself in helps to carve up and shape your conception of the world.
   b. The brain works in a domain-specific manner, with languages working in an isolated fashion.
   c. Language can affect how we perceive and interact with the world.
   d. Our cognition is not affected by language per se, but by the environment we grow up in
   e. a and c

31. Which of the following factors affect brain morphology?
   a. Experience
   b. Genetics
   c. Biological development
   d. Environment
   e. All of the above

32. A neuron sums inputs _____ in order to decide whether to initiate an action potential.
   a. Hierarchically
   b. Temporally
   c. Spatially
   d. Both b and c
   e. None of the above

33. True or False. Water molecules have greater fractional anisotropy than axonal tracts.
   a. True
   b. False

34. If the observed data is highly probable given a hypothesis, we say that the _____ is high.
   a. Posterior probability
   b. Computational probability
   c. Likelihood
   d. Prior probability
   e. Consistency

35. What does area VIP do?
   a. Provides an allocentric representation of space.
   b. Responsible for both visual and tactile information processing.
   c. Contains a map of the egocentric space that extends beyond the body.
   d. Maps out head direction in the world centered frame of reference.
   e. Both b and c
36. Which of the following is not considered a part of Cox’s axioms of probability?
   a. Degrees of belief are represented by real numbers
   b. Self-consistency
   c. Marginalization and discounting
   d. Qualitative correspondence with common sense
   e. b and c

37. A position along a path can be defined in which of the following ways?
   a. As a point in a space relative to the boundaries of the surroundings.
   b. As a point along a path relative to other features of the path (turns, start/end point).
   c. As a point at a certain distance along a path relative to its whole length (roughly X% along the path).
   d. All of the above.
   e. None of the above.

38. In the _____, fractional anisotropy in relevant brain regions is greater in children who are better at the task.
   a. Flanker task
   b. Stop-signal task
   c. Spatial working memory task
   d. None of the above
   e. All of the above

39. Which of the following does NOT contribute to an egocentric frame of reference?
   a. Somatosensation
   b. Vision
   c. Proprioception
   d. Exteroception
   e. Vestibular sense

40. Cross-correlation maps can provide information about
   a. Statistical association between brain regions
   b. Causal relationships of neural activity among cells
   c. Directionality of fiber tracts
   d. Anatomical structures of neurons
   e. The density of dendritic spines

41. Which of the following is not a term in Bayes’ Theorem?
   a. Prior probability
   b. Posterior probability
   c. Marginal probability
   d. Likelihood
   e. Evidence

42. Referring to an object's location as being "due north" is an example of a(n):
   a. Relative frame of reference
   b. Centric frame of reference
   c. Absolute frame of reference
   d. Intrinsic frame of reference
   e. None of the above
43. If you’re on drugs and see an elephant in a shopping mall, you’re likely to think that the elephant is a hallucination. If you’re on drugs and see an elephant near a zoo, you’re more likely to think that the elephant is real. What is a natural Bayesian inference formulation for this scenario?
   a. The prior probability of seeing an elephant is higher near a zoo than near a mall, so the hypothesis that you’re seeing correctly is given a higher probability near a zoo.
   b. The prior probability of seeing an elephant is higher near a mall than a zoo, so the hypothesis that you’re seeing correctly is given a higher probability near a mall.
   c. The posterior probability of seeing an elephant is higher near a mall than near a zoo, so the hypothesis that you’re seeing correctly is given a higher probability near a zoo.
   d. a and b
   e. None of the above

44. True or False. According to David Marr, there is a single best level of description to understand how the brain works.
   a. True
   b. False

45. Bundles of axons in the central nervous system are called ________
   a. Tracts
   b. Gray matter
   c. Ganglia
   d. Nerves
   e. None of the above

46. What does FA measure?
   a. The degree of diffusion anisotropy
   b. The direction of fiber projection
   c. The volume of gray matter
   d. The accuracy of word identification
   e. The thickness of cortex

47. What level of description is most naturally described in terms of probabilistic inference?
   a. Behavioral
   b. Computational
   c. Environmental
   d. Implementational
   e. Algorithmic

48. What are white matter and gray matter, respectively?
   a. neuron cell bodies and other non-myelinated cell parts; myelinated axons
   b. neuron cell bodies and other non-myelinated cell parts; myelinated dendrites
   c. myelinated axons; neuron cell bodies and other non-myelinated cell parts
   d. myelinated dendrites; neuron cell bodies and other non-myelinated cell parts
   e. None of the above is correct.

49. Bundles of axons in the peripheral nervous system are ________
   a. Nerves
   b. White matter
   c. Gray matter
   d. Tracts
   e. None of the above
50. Brain imaging studies indicate that individual differences in brain development are associated with differences in ___ among children
   a. Cognitive capacity
   b. Emotional profile
   c. Physical attractiveness
   d. a and b
   e. a, b, and c

51. Which of the following is not evidence in support of the Whorfian hypothesis?
   a. Mandarin speakers can confirm the order of months faster when primed by spatial reasoning about vertically spaced objects, compared to primed by horizontally spaced objects.
   b. Korean prelinguistic infants look longer at a scene with “in” than with “on” spatial relations.
   c. German and Spanish use different grammatical genders for some nouns, and this grammatical difference makes them describe these objects differently.
   d. Because there is no grammatical boundary between objects and substance in Yucatec Mayan, speakers of Mayan attend more to the materials and substance that comprise the objects.
   e. All of the above are statements that support the Whorfian hypothesis.

52. True or False. Electron tomography (ET) is an imaging technique that uses beams of light to obtain detailed 3D structures of subcellular macromolecular objects.
   a. True
   b. False

53. Which of the following apparently decreases during early childhood?
   a. Cortical area
   b. Cortical volume
   c. Cortical thickness
   d. All of the above
   e. None of the above

54. Which of these is an example of motion parallax?
   a. The more details you can see in a scene, the better you see motion.
   b. When part of an object is occluded, the object moves slower.
   c. Distal objects move slower while proximate objects move faster.
   d. The larger number of degrees you have to move your eyes to converge an object, the farther it is.
   e. All of the above.

55. What is the neuron doctrine?
   a. The neuron is the basic structural and functional unit of the brain.
   b. The thalamus is the basic structural and functional unit of the brain.
   c. The neocortex is the basic structural and functional unit of the brain.
   d. The layers of neo-cortex are the basic structural and functional unit of the brain.
   e. None of the above.

56. Which of the following brain areas is known to integrate somatosensory and visual information in representing peripersonal space?
   a. Hippocampus.
   b. Area V7 in parietal cortex.
   c. Superior temporal sulcus.
   d. Area VIP in parietal cortex.
   e. Area V1 in occipital cortex.
57. Brain morphometry is a way to:
   a. Measure neural anatomy, enabling the tracking of structural changes over time.
   b. Image brain function and metabolism with great temporal resolution.
   c. Image brain function and metabolism with great spatial resolution.
   d. Measure cortical oscillations from the scalp as they change.
   e. None of the above.

58. True or False. In schizophrenic patients, there are fewer dendritic spines than healthy individuals.
   a. True
   b. False

59. Which of the following describes an intrinsic frame of reference?
   a. Using salient environmental cues to describe space dedicated to a given location
   b. Describing locations entirely based on the viewer’s point of view.
   c. Describing locations of other objects based on the object’s point of view.
   d. Using directions such as North, East, South and West to describe location of objects.
   e. a and d

60. What is the egocentric frame of reference?
   a. Space as it pertains to the viewpoint of the observer.
   b. Space as it pertains to such that every object has its own space.
   c. Space as it pertains to routes that are traveled frequently.
   d. It is an absolute or a world-centered frame of reference.

61. Oligodendrocytes are:
   a. Cells that help myelinate axon tracts to form white matter in the brain
   b. Cells that communciate via action potentials
   c. Cells that extracellular proteins that bind to receptors.
   d. Cells that aid in the growth of gray matter in the brain.
   e. None of the above

62. ________________ increases in early childhood, and begins to contract later in childhood. In contrast, ________________ decreases throughout the life span.
   a. Cortical surface area; cortical thickness.
   b. Cortical Thickness; cortical surface area.
   c. White Matter; cortical surface area.
   d. Cortical surface area; subcortical surface area.
   e. Cortical thickness; subcortical surface area.

63. Which of the following is a spatial description using a relative frame of reference?
   a. The key is to the north of the book.
   b. The key is uphill to the book.
   c. The key is to the book’s left.
   d. The key is to the right of the book.
   e. None of the above is correct.

64. According to Bayes’ Theorem, the posterior probability will be high if:
   a. The hypothesis is plausible
   b. The hypothesis strongly predicts the observed data.
   c. The data is unexpected.
   d. A and B
   e. All of the above
65. True or False. The sensory homunculus is an example of an allocentric map.
   a. True
   b. False

66. Which of the following imaging techniques are NOT used to accurately view brain morphology.
   a. fMRI
   b. X-ray
   c. Diffusion Tensor Imaging
   d. CT scan

67. True or False. Bayes’ theorem relates hypotheses and data via conditional probabilities, and is therefore useful for inferring underlying causes for observed data.
   a. True
   b. False

68. Which of the following is not an example of probabilistic inference?
   a. Discounting and marginalization
   b. Models selection and induction
   c. Explaining away
   d. Hierarchical inference and abstraction
   e. Deductive reasoning

69. True or False. The direction of writing in one’s native language affects the sequential allocation of visual attention in a non-linguistic task.
   a. True
   b. False

70. Which of the following is not true about brain morphometry?
   a. There is greater fractional anisotropy in white matter than gray matter.
   b. There’s an increase in size of the corpus collosum of rat brains as they grow older.
   c. There’s an increase of myelination of axons in the brain during maturation.
   d. There’s a constant growth of white matter while a sustained level of gray matter through adolescence.
   e. DTI is an imaging technique used to observe the development of axonal tracts in the brain.