Chapter 2--Methods of Investigating the Brain

Student: _____

1. _____ staining would selectively dye white matter black.

   _____

2. The _____ stain colors the cell body of the neuron.

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3. _____ allows for the mapping of neuronal pathways using an axonal transport mechanisms.

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4. For an air encephalogram, gas fills the _____ before a standard X-ray of the brain is taken.

   _____

5. To diagnose structural abnormalities in blood vessels or in their arrangement, a physician might request a(n) _____.

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7. _____ activity (8 to 12 Hz) is the predominant background activity in wakeful person.

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8. _____ involves the measurement of changes in the magnetic field that are generated by the underlying electrical activity of active neurons.

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9. _____ is a medical technique to collect a sample of cerebrospinal fluid (CSF) surrounding the spinal cord for diagnostic study.

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10. The _____ can diagnose a malfunction of the auditory nerve at the inferior colliculus.

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11. The _____ is often used in imaging studies to isolate characteristics of the brain that are relevant during a specific neuropsychological task.

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12. _____ assesses the electrical activity of a specific sensory process.

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13. _____ is used to diagnose neuromuscular disorders.

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14. A type of EEG in which electrodes are placed directly on the surface of the brain is called a(n) _____.

    _____

15. An EEG can record the neuronal activity of deeper subcortical structures just as well as that of cortical structures.

    True False

16. Data from a CT scan can be viewed in any orientation (i.e., sagittal, horizontal, or coronal).

    True False

17. The MEG is a recording of the weak magnetic currents generated by the brain.

    True False

18. The cerebral magnetic field used for a MEG induces a small current in magnetic detection coils which in turn excite special devices called SQUIDS.

    True False

19. In contrast to the CT scan, the MRI scan passes an x-ray beam through the head and creates an index of tissue density.

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20. EMG is an electrical analysis of muscles, a useful diagnostic procedure to aid in the diagnosis of central nerve damage.

    True False

21. Unlike CT images, in which the appearance is related primarily to the electron density of the material, MR images depend on many variables, including proton density and T1 and T2 relaxation effects.

    True False

22. One advantage of PET is that it is inexpensive.

    True False

23. Golgi used silver chromate to stain dead neurons.

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25. The lumbar puncture is done in order to collect a sample of cerebrospinal fluid.

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26. PET uses a radioactive tracer to detect glucose and oxygen metabolism, as well as cerebral blood flow.

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28. An enhanced CT scan involves:

    A. an injection of sodium amobarbital.
    B. oral consumption of an ionized mixture.
    C. an injection of an iodinated contrast agent.
    D. none of these.

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30. To record an EEG, leads are placed on the scalp and connected to an:

A. electrocardiograph.
B. electromegagraph.
C. electroencephalograph.
D. electromyography.

31. The primary health concern associated with the Computed Transaxial Tomography scan is that:

A. it does not provide as much spatial resolution as the MRI.
B. it requires penetrating radiation.
C. it requires the use of a contrast agent.
D. acute headaches are commonly reported.

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A. the injection of a barbiturate to anesthetize one hemisphere.
B. scalp recording of alpha, beta, and theta waves.
C. the injection of an iodine agent to visualize the activity of one hemisphere.
D. injection of oxygenated air for visualization of the ventricles.

34. The skull x-ray:

A. obtains a two-dimensional representation of the head.
B. is a very sensitive technique for brain imaging.
C. obtains a three-dimensional representation of the head.
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35. The air encephalogram is also called:

A. the Wada technique.
B. intravenous angiography.
C. pneumoencephalography.
D. evoked potential.

36. The EEG is mostly a measure of:

A. subcortical neuronal firing.
B. muscular feedback.
C. cortical neuronal firing.
D. skin responses to pressure.

37. Which of the following is not an invasive procedure?

A. Wada technique
B. air encephalogram
C. angiography
D. computed transaxial tomography

38. Gamma activity:

A. is a low amplitude slow activity wave.
B. is a low-amplitude fast-activity wave.
C. has the slowest rhythm rate.
D. is associated with hypoarousal.

39. Alpha activity is:

A. the predominant background activity in an awake person.
B. 18 to 35 hertz.
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40. Theta waves are:

A. associated with being at rest with eyes open.
B. indicative of drowsiness and being inwardly focused.
C. indicative of brain death.
D. ranges of .05 to 4 hertz.

41. One of the fundamental ways neurons organize their rate of electrical activity is:

A. by desynchronizing their neuronal firings.
B. by emitting gamma-amino butyric acid.
C. by synchronizing their oscillations.
D. by taking cues from the thalamus.

42. BEAM stands for:

A. brain electrical activity mapping.
B. brain electrical availability mapping.
C. brainstem evoked auditory mapping.
D. brain electrical activity mode.

43. PET scans allow us to examine:

A. the structure of brain tissue.
B. both pattern of brain biochemistry and brain metabolism.
C. pattern of brain biochemistry.
D. pattern of brain metabolism.

44. BEAM provides:

A. color-coded mapping of the brain's metabolic activity in real time.
B. topographic displays showing neuroelectric activity.
C. activity in real time at the subcortical level.
D. a way to enhance the amount of information available on a standard EEG.

45. In comparison to traditional EEG, the BEAM system has been shown to:

A. be more sensitive to electrical correlates of cognitive tasks.
B. be more sensitive to electrical correlates of sensory and motor tasks.
C. be less expensive.
D. be useful for identifying what the person is thinking.

46. An evoked potential is:

A. analyzed according to the wavelength of signal.
B. useful for displaying electrical activity of the brain in response to a stimulus.
C. analyzed according to the colors that appear on a map of the brain.
D. different from an event-related potential.

47. An evoked potential:

A. is also called an event-related potential.
B. indirectly generates electrical activity along the central and peripheral pathways in the brain.
C. involves the stimulation of specific sensory fibers.
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48. With auditory evoked potential:

A. auditory clicks are presented to each ear via headphones.
B. it is possible to diagnose a lesion in the inferior colliculus.
C. the auditory pathways generate an electrical signal along the central auditory pathways.
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49. In visual evoked responses (VER), electrodes are placed over:

A. the temporal region.
B. occipital region.
C. frontal region.
D. both the parietal and occipital regions.

50. SER is:

A. an abbreviation for Somatosensory Evoked Response.
B. obtained by stimulating the median nerve at the wrist.
C. useful for measuring abnormalities of the PNS.
D. all of these

51. To identify a neuromuscular disorder or peripheral nerve damage, a physician would most likely request a(n):

    A. electroencephalography.
    B. BAER.
    C. electromyography.
    D. CT scan.

52. In contrast to SPECT, PET:

    A. uses a tracer with a very short half-life.
    B. requires an expensive cyclotron.
    C. allows one to examine both regional cerebral glucose utilization and oxygen metabolism.
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53. Because the radioisotope used in a PET scan is short-lived, the amount of radiation exposure the patient receives is:

    A. equal to two chest X-rays.
    B. equal to a SPECT scan.
    C. equal to that of an MRI scan.
    D. equal to that emitted by BAER.

54. Magnetism is a property of matter that is a result of:

    A. orbiting protons.
    B. orbiting electrons.
    C. orbiting nuclei.
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55. The principle of the MRI is that the hydrogen atom:

    A. resonates due to radio waves.
    B. resonates due to radio waves and a magnetic field.
    C. resonates due to a magnetic field.
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56. For identifying tumors or subcortical alterations, it is most advantageous to use the:

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57. To determine which parts of the brain are activated by different types of physical sensation or activity, such as sight, sound or movement of a subject's finger, an experimenter would most likely use:

A. functional MRI scan (fMRI).
B. a PET scan.
C. an MRI.
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58. The advantage of fMRI over SPECT, PET, and CT is:

A. it is less expensive.
B. there is no radiation exposure.
C. it is more useful as an experimental or research tool.
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59. MEG stands for:

A. magnetic electronic gravitron.
B. magnetoencephalogram.
C. magnetic electrical generator.
D. magnetoelectrocardiogram.

60. Utilization of a MEG is expensive because it requires:

A. liquid helium to keep the system at a low temperature.
B. liquid nitrogen to keep the system at a low temperature.
C. the use of a radioactive isotope.
D. the use of an iodine tracer.

61. Which of the following is used to diagnose neuromuscular disorders?

A. electromyography.
B. evoked potential.
C. electroencephalogram.
D. brain electrical activity mapping.

62. Which of the following is true of single-photon emission computerized tomography (SPECT)?

A. SPECT is more expensive than positron emission tomography (PET).
B. SPECT provides a two-dimensional representation.
C. The SPECT tracer clears from the brain in approximately 15 minutes.
D. SPECT can be used to study subjects while they are performing neuropsychological tasks.

63. Which of the following is tested by a neurologist during a neurological examination?

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B. rudimentary language functions
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66. A budding neuropsychologist needs to understand:

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B. neurological disorders and their associated cognitive deficits.
C. the social impact any given neurological condition may have on a patient.
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67. What method allows for the visualization of a lesion from any angle or perspective?

A. angiography
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68. List the advantages and disadvantages of computerized tomography.

69. Describe the mechanism of action for functional magnetic resonance imaging.

70. Describe the clinical utility of single photon emissions tomography.

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   Nissl

3. _____ allows for the mapping of neuronal pathways using an axonal transport mechanisms.

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