Adult Development and Aging 8th edition Cavanaugh Test Bank

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TRUE/FALSE

1 : The neuroimaging techniques used most often are structural neuroimaging and functional neuroimaging.
A : true
B : false

Correct Answer : A

2 : Bone fractures and tumors, in the brain are typically detected by the use of functional neuroimaging.
A : true
B : false

Correct Answer : B

3 : The neuroimaging techniques used most is near-infrared spectroscopic imaging (NIRSI).
A : true
B : false

Correct Answer : B

4 : The neuropsychological approach compares the brain functioning of healthy older adults with adults displaying various pathological brain disorders.
A : true
B : false

Correct Answer : A

5 : The neurocorrelational approach attempts to link measures of cognitive performance to measures of brain
A : true
B : false

Correct Answer : A

6 : The certain cognitive functions, such as well-practiced tasks, vocabulary, and wisdom, can be preserved into old age.
A : true
B : false

Correct Answer : A

7 : The activation-imaging approach allows for real-time investigation of changes in brain function as they affect cognitive performance in older adults.
A : true
B : false

Correct Answer : A

8 : Neurotransmitters are chemicals that cross the spaces between neurons.
A : true

B : false

Correct Answer : A

9 : The study of the structure of the brain is called neuroanatomy.
A : true
B : false

Correct Answer : A

10 : The cerebellum is the outermost part of the brain. It consists of two hemispheres (the right and the left), which are connected by the corpus callosum.
A : true
B : false

Correct Answer : B

11 : The method that results in an index of the structural health of white matter is called diffusion tensor imaging or DTI.
A : true
B : false

Correct Answer : A

12 : The number of potential connections in the brain increases with age, as measured by the number of synapses among neurons.
A : true
B : false

Correct Answer : B

13 : Aside from dopamine, serotonin and acetylcholine are two other important neuroresistors related to cognitive aging.
A : true
B : false

Correct Answer : B

14 : Ones theory of mind develops across the life span and is one benchmark by which to determine whether an individual has a developmental or cognitive impairment.
A : true
B : false

Correct Answer : A

15 : There is an increase in the processing of negative emotional information and a decrease in the processing of positive emotional information that occurs with age.
A : true
B : false

Correct Answer : B

16 : Even though aging is associated with an overall decrease in the number of new neurons,

this differs across regions of the brain.
A : true
B : false

Correct Answer : A

17 : Older adults compensate for brain changes by activating fewer areas of the brain than young adults when performing the same tasks.
A : true
B : false

Correct Answer : B

18 : The scaffolding networks used by older adults are more efficient than the honed, focal ones they used as young adults.
A : true
B : false

Correct Answer : B

19 : Supplementary processes take place when different brain regions are activated to compensate for lacking or insufficient processing resources.
A : true
B : false

Correct Answer : A

20 : Contrary to what was previously thought, brain cells can regenerate, even in late life, under the right circumstances.
A : true
B : false

Correct Answer : A

MULTIPLE CHOICE

21 : In grocery stores and on television, there is a trend toward marketing brain foods to the general public. These brain foods contain, which protect your cells from free radicals.
A : Antioxidants
B : Omega-3 fats
C : B vitamins
D : Hormone replacements

Correct Answer : A

22 : Neuroimaging has allowed us to
A : solve the nature-nuture controversy.
B : identify the causes of Alzheimers disease.
C : see inside the brain of a living person to examine the structures of the brain.
D : examine ones genetic structure and predict which individuals will develop chronic diseases with age.

Correct Answer : C

23 : The field of neuroscience can be defined as
A : the study of free radicals.
B : the study of the compensatory changes that older adults make in adapting to behavioral decline.
C : the use of stem cells to generate new neurons.
D : the study of the brain, particularly the study of plasticity in the aging brain.

Correct Answer : D

24 : Which area of neuroscience has revolutionized our understanding of the relationships between the brain and behavior?
A : Psychoanalytic theory
B : Social cognitive theory
C : Neuroimaging
D : Molecular anatomy

Correct Answer : C

25 : Which of the following is associated with neuroanatomy?
A : Brain structures and functioning
B : The effect of reinforcements, such as rewards and punishments, on behavior
C : Repressed impulses and their effect on the id, ego, and superego
D : The theory of the mind

Correct Answer : A

26 : Neuroimaging has allowed us to
A : determine what a healthy brain looks like.
B : see exactly how the brain changes over time.
C : determine which brain changes are normative and which are not.
D : see inside the brain of a living person to examine the various structures of the brain.

Correct Answer : D

27 : The two neuroimaging techniques that are most often used provide
A : detailed images of the anatomical features of the brain and indications of brain activity.
B : measurements of the diffusion of water molecules in brain tissue.
C : measures of heart beat and respiration changes in older adults.
D : evidence of the positivity effect.

Correct Answer : A

28 : X-rays, CT scans, and MRIs are examples of
A : genetic imaging.
B : nonnormative brain development.
C : structural neuroimaging.
D : functional neuroimaging.

Correct Answer : C

29 : Magnetic resonance imaging (MRI) produces
A : pictures that represent brain activity as different colors.
B : images of brain activity with low anatomical detail.
C : pictures of healthy brain functioning but not of pathological brain functioning.
D : highly detailed images of the anatomical structures of the brain.

Correct Answer : D

30 : Structural neuroimaging focuses on the of the brain.
A : blood flow
B : structure
C : development
D : function

Correct Answer : B

31 : Functional imaging techniques focus on the of the brain.
A : structure
B : anatomical features
C : activity
D : blood flow

Correct Answer : C

32 : SPECT and PET are examples of
A : structural neuroimaging techniques.
B : functional neuroimaging techniques.
C : Alzheimers assessments.
D : behavioral tests that assess frontal lobe atrophy.

Correct Answer : B

33 : Which approach compares the brain functioning of healthy older adults with adults displaying various pathological disorders of the brain?
A : Neurobiological
B : Bioneurosocial
C : Psychological
D : Neuropsychological

Correct Answer : D

34 : Which of the following approaches attempts to link measures of cognitive performance to measures of brain structure or functioning?
A : Neurocorrelational
B : Psychological
C : Neuropsychological
D : Neurobiosocial

Correct Answer : A

35 : Why are the results from neurocorrelational studies considered speculative?
A : Because random sampling is not used
B : Because the measures used in these types of studies lack validity

C : Because we cannot be certain that the behavioral tests accurately assess the actual anatomical and functional activity of the brain region under investigation
D : Because correlational findings are more speculative than those acquired from experimental designs

Correct Answer : C

36 : Which approach attempts to directly link functional brain activity with cognitive behavioral data?
A : Neurobiological
B : Correlational
C : Activation imaging
D : Psychological

Correct Answer : C

37 : changes allow older adults to adapt to the inevitable decline of specific areas of the brain.
A : Compensatory
B : Personality
C : Compromise
D : Collaboration

Correct Answer : A

38 : Neuroscience has brought an important perspective to studying cognitive aging. Specifically, it has
A : allowed us to find a cure for Alzheimers disease.
B : given us ways to test our theories of brainbehavior relations.
C : showed us how to reverse cognitive decline in elderly individuals.
D : given us ways to eliminate free radicals.

Correct Answer : B

39 : Research methods that focus on understanding age-related changes in the brain can help explain why certain_____ functions are preserved into old age.
A : cognitive
B : muscle
C : physical health
D : sensory

Correct Answer : A

40 : Neuroscientific methods have limitations that include all of the following EXCEPT
A : they must be used appropriately.
B : they must use computer-based imaging.
C : they must be ethical.
D : they must be used appropriately and must be ethical.

Correct Answer : B

41 : Processing speed as people age.
A : increases
B : decreases

C : becomes distorted
D : remains the same

Correct Answer : B

42 : In the past, much research regarding adult development and aging was based upon data.
A : psychosocial
B : behavioral
C : social
D : neuroimaging

Correct Answer : B

43 : Neuroscientific methods have shown that brain activity involved in occurs in areas of the brain that are among the first affected by Alzheimers disease.
A : identification of faces
B : remembering items on a list
C : emotion regulation
D : executive functioning activities such as planning

Correct Answer : A

44 : Key structural, or anatomical, features of the neuron include all the following EXCEPT
A : axons.
B : dendrites.
C : terminal branches.
D : synapses.

Correct Answer : D

45 : Chemicals that travel across the space between neurons are called
A : receptors.
B : synapses.
C : neurofibers.
D : neurotransmitters.

Correct Answer : D

46 : The space between neurons is called the
A : gaptic region.
B : corpus callosum.
C : synapse.
D : terminal branches.

Correct Answer : C

47 : Most neuroscience research has focused on the
A : right axon.
B : brain stem.
C : cerebral cortex.
D : focal area.

Correct Answer : C

48 : Executive functions include all of the following EXCEPT
A : making plans.
B : monitoring internal temperature.
C : carrying out plans.
D : switching between tasks.

Correct Answer : B

49 : The are involved in higher-order executive functions such as the ability to make and carry out plans, switch between tasks, and maintain attention and focus.
A : cerebellum and hippocampus
B : prefrontal and frontal cortex
C : hippocampus and limbic system
D : cerebellum and amygdala

Correct Answer : B

50 : Overall, there is considerable shrinkage that occurs in the aging brain. However, the shrinkage is selective. The prefrontal cortex, the , and the all show profound shrinkage.
A : frontal lobe; left cortex
B : parietal; occipital
C : cerebellum; amygdale
D : hippocampus; cerebellum

Correct Answer : D

51 : The areas of the brain related to sensory functions, such as the visual cortex, show relatively little
A : shrinkage.
B : improvement across the life span.
C : white matter.
D : intensity.

Correct Answer : A

52 : In the brain, _____ has an important role in arousal, sensory perception, and sustaining attention.
A : acetylcholine
B : serotonin
C : dopamine
D : GABA

Correct Answer : A

53 : The white matter area of the brain shows deterioration with increasing age. A neuroimaging method called assesses the rate and direction that water diffuses through the white matter.
A : fMRI
B : white matter hyperintensities
C : CT scan
D : diffusion tensor imaging

Correct Answer : D

54 : White matter hyperintensities (WMH) may indicate
A : extremely high intelligence.
B : predisposition to Alzheimers disease.
C : brain pathologies such as neural atrophy.
D : emotional pathology.

Correct Answer : C

55 : White matter hyperintensities (WMH) are linked to cerebrovascular diseases, which are preventable and can be treated with
A : surgery and medications.
B : medications and lifestyle changes.
C : cognitive behavioral therapy and changes in diet.
D : hypnosis and lifestyle changes.

Correct Answer : B

56 : Research indicates that Theory of Mind abilities _____ during childhood and show age-related _____ in adults over age 75.
A : do not change; decline
B : decline; do not change
C : decline; increase
D : decrease; decline

Correct Answer : D

57 : functioning includes processes such as the ability to control what one is thinking about at any one moment in time and the ability to focus on relevant information and eliminate irrelevant information.
A : Executive
B : Cognitive
C : Psychological
D : Conscious

Correct Answer : A

58 : Executive functioning failures in older adults can be seen when older adults
A : have difficulty factoring out false information in an article they are reading.
B : have trouble recognizing familiar faces.
C : have problems maintaining their balance and coordination.
D : experience visual difficulties such as distinguishing certain colors and reduced night vision.

Correct Answer : A

59 : For adult development and aging research, the most important elements of the limbic system are the
A : prefrontal and frontal cortex.
B : corpus callosum and cerebellum.
C : corpus callosum and frontal cortex.
D : amygdala and hippocampus.

Correct Answer : D

60 : Reductions in the of the hippocampus are related to memory decline.
A : volume
B : density
C : dendritic tangles
D : neurotransmitters

Correct Answer : A

61 : The hippocampus is intimately involved in various aspects of memory, such as
A : hypnotic memory.
B : repressed memory.
C : autobiographical memory.
D : muscle memory.

Correct Answer : C

62 : What are the age-related changes in neurons?
A : There are no age-related changes in neurons, but there are changes in neurotransmitters.
B : The number of neurons increases.
C : Tangles develop in the fibers that make up the axon.
D : The number of connections between neurons, measured as synapses, increases after age 75.

Correct Answer : C

63 : Atrophy of the temporal lobe has been connected to
A : decline in planning and executing plans.
B : Alzheimers disease.
C : accelerated growth of stem cells.
D : cardiovascular disease.

Correct Answer : B

64 : When a person accurately remembers negative high-arousal items, this corresponds to increased activation of the
A : amygdala and the temporal region.
B : amygdala and prefrontal cortex.
C : amygdala and the occipital lobe.
D : amygdala and the sensory motor area.

Correct Answer : B

65 : Research by Winecoff and colleagues (2011) indicates that as cognitive abilities decline, people may be less able to , a pattern typical in diseases such as dementia.
A : ignore irrelevant information
B : learn new tasks
C : hold as many pieces of information in working memory at one time
D : regulate their emotions

Correct Answer : D

66 : Attributional inferences are

A : conclusions based on the effects of butanol.
B : making causal judgements about why social situations occur.
C : judgements about how repressed memories are caused.
D : decisions based on data as to whether the results are causal or correlational.

Correct Answer : B

67 : Very little research has examined the specific underlying neural mechanisms of
A : emotion.
B : decision making.
C : neural transmission.
D : sensation.

Correct Answer : A

68 : Winecoffs research found that fMRI data showed that emotion regulation modulates the functional interaction between the
A : reticular formation and the amygdala.
B : vestibular sensory array and the amygdala.
C : thalamus and the amygdala.
D : prefrontal cortex and the amygdala.

Correct Answer : D

69 : Donald is 71 years old and is more motivated to derive emotional meaning form life and to maintain positive feelings. Donalds feelings are characteristic of
A : the theory of mind effect.
B : the Hayflick effect.
C : the positivity effect.
D : dopaminergic effect.

Correct Answer : C

70 : Across the research, the typical finding is that older adults have reduced brain activity in the areas when compared with younger adults.
A : prefrontal and temporal
B : cerebellum and cortex
C : corpus callosum
D : limbic system

Correct Answer : A

71 : is the neurotransmitter associated with higher-level cognitive functioning like inhibiting thoughts, attention, and planning.
A : Estrogen
B : Insulin
C : Cytosine
D : Dopamine

Correct Answer : D

72 : Collectively, the neurons that use dopamine are called the
A : dopaminergic system.

B : limbic system.
C : inhibition system.
D : pain adjustment system.

Correct Answer : A

73 : The effective functioning of the dopaminergic system in normal aging.
A : increases
B : declines
C : stays the same
D : misfires

Correct Answer : B

74 : Research has found that declines in the dopaminergic system are related to declines in memory and tasks.
A : long-term; speed
B : semantic; attention
C : episodic; thought
D : episodic; speed

Correct Answer : D

75 : Abnormal processing of which neurotransmitter has been implicated in cognitive decline in normal aging, Alzheimers disease, and schizophrenia?
A : Serotonin
B : Dopamine
C : Acetylcholine
D : Cerebraltonin

Correct Answer : A

76 : To explore brain-related factors that might explain age differences in cognitive functioning, a researcher may use a(n) _____ to examine how changes in brain activity occur in correspondence with changes in task demands.
A : EEG
B : MRI
C : fMRI
D : eMRI

Correct Answer : C

77 : Older adults sometimes show reduced activation of appropriate prefrontal regions. At other times, they show the same or greater recruitment of these areas, when compared with younger adults, depending on the task they are doing. This indicates that prefrontal recruitment is
A : unpredictable.
B : impossible to measure.
C : predictable in younger adults but unpredictable in older adults.
D : context dependent.

Correct Answer : D

78 : The ability, termed Theory of Mind, _____ during childhood and _____ after

age 75.
A : decreases; increases
B : increases; decreases
C : increases; remains stable
D : remains stable; increases

Correct Answer : B

79 : Structural brain changes have been linked to executive function. For example, age-related declines in may affect white matter structures, which underlie all the areas important to executive functioning.
A : serotonin
B : the functioning of blood vessels
C : cognitive abilities
D : unilateralization

Correct Answer : B

80 : Which region of the brain is implicated in emotional processing?
A : Cerebellum
B : Sensorimotor area
C : Lateral cortex
D : Prefrontal cortex

Correct Answer : D

81 : The main point of functional brain imaging research is to establish how age-related deterioration in specific brain structures affects a persons ability to perform various tasks,
A : measuring both at the same time.
B : after their abilities show loss.
C : by measuring activity in brain structures first and then the ability to perform various tasks second.
D : by measuring the ability to perform various tasks first and the activity in the brain second.

Correct Answer : B

82 : P-FIT stands for
A : Passive-Frontal Lobe Integration Theory.
B : Parieto-Frontal Integration Theory.
C : Parieto-Fractional Imperative Test.
D : Partial-Frontal Interest Theory.

Correct Answer : B

83 : The P-FIT theory created by Jung and Haier (2007) was based upon
A : a cross-sectional study of 120 Alzheimers patients.
B : a meta-analysis of 37 research studies.
C : Piagets theory of cognitive development.
D : a longitudinal study of 500 individuals with dementia.

Correct Answer : B

84 : Grady (2012) points out that reduced prefrontal recruitment in aging is

A : noncontext-dependent.
B : context-independent.
C : noncontext-independent.
D : context-dependent.

Correct Answer : D

85 : It is now widely accepted that bilateral activation in the aging brain
A : may serve a functional and supportive role in cognitive functioning.
B : may be the result of chronic illnesses in the individual.
C : is evidence that older brains are more efficient.
D : is no different than what is observed in younger brains.

Correct Answer : A

86 : When examining bilateral prefrontal engagement of older adults, which of the following is true?
A : Older adults show less prefrontal bilateral activity during working memory tasks than younger adults.
B : Low-performing older adults show left-lateralized activation during a long-term memory task.
C : High-performing older adults show no bilateral prefrontal engagement.
D : High-performing older adults show bilateral prefrontal engagement.

Correct Answer : D

87 : Which of the following is NOT one of the models discussed in your textbook that seeks to explain how the brain reorganizes and compensates for age-related changes?
A : P-FIT
B : HAROLD
C : CRUNCH
D : STAC-r

Correct Answer : A

88 : The HAROLD model indicates that older brains recruit additional neural units to increase attentional resources, processing speed, or
A : inhibitory control.
B : long-term memory capacity.
C : facial recognition.
D : intelligence.

Correct Answer : A

89 : The CRUNCH model suggests that there are two main mechanisms the older brain uses to perform tasks:
A : increased synapses and neurotransmitters.
B : memory aids such as mnemonic devices and brain training exercises.
C : brain training and recruiting friends to help with cognitive tasks.
D : more of the same and supplementary processes.

Correct Answer : D

90 : The HAROLD model indicates that older brains recruit additional neural units to increase

attentional resources, processing speed, or
A : STAC-r model.
B : P-FIT model.
C : PASA model.
D : CRUNCH model.

Correct Answer : D

91 : The posterior-anterior shift in aging (PASA) is thought to reflect age-related
A : increases in inhibition.
B : hemispheric asymmetry.
C : compensation.
D : increases in intelligence.

Correct Answer : C

92 : One of the most significant findings in the neuroscience literature is the observed of neural activationpatterns in older adults brain activity when compared with the brain functioning of younger adults.
A : nonlateralization
B : increased lateralization
C : reduced lateralization
D : effortful lateralization

Correct Answer : C

93 : Activation of both left and right prefrontal areas of the brain is called activation.
A : bilateral
B : unilateral
C : hyperintensive
D : atrophic

Correct Answer : A

94 : Research findings have shown an association between bilateral activation in older adults and performance in memory tasks.
A : Long-term
B : Sensory
C : Working
D : Semantic

Correct Answer : C

95 : One way researchers study how brain activation patterns among key structures operate is to study them in people with
A : known neurological disorders.
B : unknown neurological disorders.
C : very high intelligence.
D : no known relatives.

Correct Answer : A

96 : Oliver Sacks explored numerous aspects of brain-behavior relations in individuals who had

A : kinesthetic dysfunctions.
B : peripheral nervous system damage.
C : respiratory conditions.
D : brain disorders.

Correct Answer : C

97 : Evidence has shown that the in frontal activity in older adults may be a response to the efficiency of neural processing related to the perceptual areas of the brain.
A : increase; increased
B : decrease; increased
C : function; increased
D : increase; decreased

Correct Answer : D

98 : The default network of the brain refers to the regions of the brain that are most when an individual is at rest and not involved in a cognitive task.
A : intense
B : inactive
C : active
D : observed

Correct Answer : C

99 : Advances in _____ allow us to adequately test conditions under which age-related _____ change in the brain is associated with decline, compensation, or even improvement in functioning.
A : neuroscientific methods; structural
B : neuropsychological methods; structural
C : neuroscientific methods; functional
D : neuropsychological methods; functional

Correct Answer : A

100 : STAC-r stands for
A : Social Tact and Cognition-revised.
B : Specialized Telemeres and Cognitive Functioning-revised.
C : Scaffolding Theory of Cognitive Aging-revised.
D : Social-Congitive Theory of Adult Competence-revised.

Correct Answer : C

101 : The scaffolding theory of cognitive aging-revised (STAC-r) model suggests that the reason older adults continue to perform at _____ levels despite neuronal deterioration is because of compensatory scaffolding.
A : low
B : high
C : superior
D : unpredictable

Correct Answer : B

102 : Compensation is the brains response to .
A : disease
B : deterioration
C : inactivity
D : injury

Correct Answer : B

103 : Park and Reuter-Lorenz argue that the integrative approach provided by the STAC-r model embraces a lifelong potential for plasticity and the ability to _____ age-related changes.
A : resist
B : adapt to
C : ignore
D : modify

Correct Answer : B

104 : Which part of the brain shows less age-related deterioration?
A : Amygdala
B : Occipital
C : Parietal
D : Prefrontal

Correct Answer : A

105 : The emotional processing areas of the brain are more _____ over time, whereas higher-order executive cognitive processes seem to _____.
A : preserved; decline
B : conserved; increase
C : preserved; increase
D : conserved; decline

Correct Answer : A

106 : is a multifaceted concept that involves the changes in structure and function of the brain over time as the result of the interaction of the brain with the environment.
A : Plasticity
B : Neurality
C : Neuroscience
D : Neurofibrillation

Correct Answer : A

107 : Contrary to a previously held popular belief, persist in the adult brain and can regenerate throughout the life span.
A : synapses
B : neurons
C : white matter
D : neural stem cells

Correct Answer : D

108 : Research on the potential of neural stem cells took a major leap forward in 2007 with the

founding of the
A : New Jersey Institute on Behavioral Science.
B : New York Neural Stem Cell Institute.
C : New York Institute on Behavioral Science.
D : New Hampshire Institute on Neurobiological Science.

Correct Answer : B

109 : The National Human Neural Stem Cell Resource supplies researchers with neural stem cells that are obtained from
A : umbilical cords.
B : postnatal, postmortem human brains.
C : mice.
D : living humans.

Correct Answer : B

110 : Research clearly shows that brain plasticity is enhanced as a result of
A : online brain-training exercises.

B : aerobic exercise.
C : having parents with high IQs.
D : lack of pollution in ones environment.

Correct Answer : B

111 : Erikson and colleagues (2009) were interested in whether aerobic exercise had any effect on the volume of the hippocampus, a key brain structure related to memory. To assess this, they had older adults
A : play basketball.
B : take yoga classes.
C : swim laps each day.
D : exercise on a motorized treadmill.

Correct Answer : D

112 : Bowman and colleagues (2012) identified three different associated with cognitive functioning and brain volume.
A : biomarker patterns
B : genes
C : personality types
D : types of exercise

Correct Answer : A

113 : The compelling research regarding the effects of aerobic exercise and diet on the aging brain and how well it functions suggests which of the following old saying appears to be true?
A : Let sleeping dogs lie.
B : You cant teach an old dog new tricks.
C : Use it or lose it.
D : All roads lead to Rome.

Correct Answer : C

114 : Which of the following biomarker patterns was associated with better cognitive functioning and greater brain volume?
A : Low blood plasma levels of vitamins C, D, and E
B : High blood plasma levels of omega-3 fatty acids
C : The biomarker pattern high in transfat
D : Low blood plasma levels of vitamins B1, Be, B6, folate, and B12

Correct Answer : B

115 : Which of the following biomarker patterns was associated with less favorable cognitive functioning and less total cerebral brain volume?
A : High blood plasma levels of B, C, D, and E b.
B : High blood plasma levels of omega-3 fatty acids
C : The biomarker pattern high in transfat
D : The biomarker pattern high in EPA

Correct Answer : C

116 : Given what you have learned about the relationship between nutrition and cognitive functioning over time, what is one piece of advice you could give others?
A : The research on the relationship between nutrition and cognitive functioning is unclear.
B : Maintaining good levels of certain nutrients in blood plasma can reduce structural changes in the brain and cognitive declines.
C : The nutrients important for womens cognitive functioning are different from those required by men.
D : After age 75, nutrition is not an important factor in cognitive functioning.

Correct Answer : B

ESSAY

117 : Why is it important to be careful regarding advertisements and literature touting the importance of brain fitness as it applies to neuroscience?

Correct Answer : Despite important insights from evidence gained through research in neuroscience that the brain can change for the better as we grow older, we have to be careful in how these findings are interpreted. These findings send an intriguing message to our aging population and there is danger in this. As in any relatively new field, descriptions in the media, especially the Internet, may extend well beyond the actual scope of our scientific understanding of the brain.

118 : Why do we say neuroimaging must be used carefully and ethically?

Correct Answer : Both structural and functional neuroimaging techniques have greatly expanded our understanding of the human brain. We now know more about normative and nonnormative changes over time as well as what areas of the brain age faster and which age slower, or are somewhat immune to the aging process. However, we still don’t know definitively which changes are normal and which are not and how these changes may vary by individual. We still need to understand more about how development or progress in one area of functioning may be accompanied by reduced functioning in another area. Finally, we still do not understand

all there is to know about individual differences in the structure and function of the brain as we age. What we observe needs to be substantiated by other research. In other words, neuroscience findings must be corroborated by other research to increase their validity.

119 : Discuss the similarities and differences between MRI and fMRI.

Correct Answer : Similarities between MRI and fMRI include: both are methods of neuroimaging that are non-invasive, they are both commonly used, and they both are technological advances that increased our understanding of the relations between the brain and our behavior in the last few decades. Differences between MRI and fMRI include: MRI provides information about the locations of structures in the brain at a specific point in time while fMRI provides information about the locations and amount of activity in areas of the brain over time, and MRI provides highly detailed anatomical images while fMRI provides less detailed anatomical images.

120 : Compare and contrast the neurocorrelational and the neuropsychological approaches to neuroscience research.

Correct Answer : The neurocorrelational and neuropsychological approaches compare because they both seek insights into the neuroscience of aging, must be applied appropriately and ethically, and have revealed new findings that psychological theories have to account for and be consistent with. They contrast because they arrive at conclusions from different approaches. The neurocorrelational method of research examines the relations between measures of cognitive performance and measures of brain structure or functioning. In this method, instead of using direct measures of brain functioning, researchers may use behavioral tests that are associated with the functioning of one brain region or another. The neuropsychological approach, on the other hand, attempts to compare the brain functioning of healthy older adults with the brain functioning of adults showing various brain pathologies. Scientists wish to understand whether changes in certain areas of the brain, due to aging or injury, result in the same types of structural or functional issues.

121 : Compare and contrast the age-related changes between neurons and neurotransmitters.

Correct Answer : The age related changes between neurons and neurotransmitters include: both show age related decline in their functions, the results of the decline in both slow speed of processing, and both are linked to Alzheimer’s disease. The age-related changes between neurons and neurotransmitters contrast because decline in neuron functioning affects the brain holistically while decline in the function of neurotransmitters is more neurotransmitter specific. Additionally, the decline in the function of neurons inhibits the functioning of neurotransmitters; however, the opposite is not true.

122 : What is the default network of the brain and how is it related to poorer performance of cognitive tasks in older adults?

Correct Answer : The default network of the brain refers to the areas of the brain that are most active when one is at rest and not engaged in any cognitive task. Older individuals have more problems than younger people suppressing this default network. For example, when a younger begins an engaging and challenging cognitive task, the default network is suppressed. Older adults show less suppression, resulting in poorer performance overall. Increased frontal cortex activity in older adults may be one way they work around this lack of suppression.

123 : Describe plasticity. Are compensatory changes in the elderly an example of plasticity? Does research using neural stem cells support the idea of plasticity?

Correct Answer : Plasticity in the brain refers to its ability over time to change in structure and function as a relation of the brain's interaction with the environment. The fact that research documents that older adults can improve their memories by being trained to use certain strategies in certain circumstances speaks to the brain's ongoing plasticity. Evidence for plasticity is also seen when older adults use bilateral activation. While younger adults use more unilateral activation when working on specific tasks, older adults use more bilateral activation. It appears they are working harder and utilizing more brain structures to optimize their thinking and performance. Finally, it was believed that neurogenesis (the proliferation of neural cells) dwindled with the embryonic period. The finding that neural stem cells exist in adult brains and can generate new neurons throughout the life span speaks to the plasticity of the human brain.

124 : Can exercise actually improve ones cognitive skills? Cite an example from research to support.

Correct Answer : Research clearly shows that brain plasticity is enhanced by aerobic exercise. Intlekofer and Cotman (2003) found that aerobic exercise can counter the declines in the hippocampus associated with Alzheimer's disease. Additionally, Erickson and colleagues (2009) found that aerobic exercise had an effect on the volume of the hippocampus, a brain structure involved in memory. Participants exercised on a treadmill, completed a spatial memory task, and had MRIs to determine hippocampal volume. Results indicated that higher fitness levels were associated with greater hippocampal weights, which in turn were associated with greater performance on the spatial memory task.

125 : What type of nutrition has been associated with better cognitive functioning and greater brain volume? What type of nutrition has been connected to poorer cognitive outcomes?

Correct Answer : Certain biomarkers, namely, those plasma levels high in B, C, D, and E and those high in omega-3 fatty acids (particularly DHA) were associated with higher cognitive functioning and greater overall brain volume. On the other hand, blood plasma levels high in transfats were associated with lower cognitive functioning and less total cerebral volume. Overall, the results of these studies indicate that keeping certain levels of specific nutrients in blood plasma enhanced cognitive ability.

126 : Describe how age-related brain deterioration may be slowed or even reversed.

Correct Answer : Eating a healthy diet, exercising, and maintaining one's intellectual activities and interests are all important in maintaining cognitive functioning and health. Having interesting work or hobbies, engaging in conversations with others, learning how to use mnemonic devices, and even doing puzzles and brain teasers all provide mental energy and promote mental flexibility.