

PSYCHOLOGY

Unit 1 – Written examination



2023 Trial Examination

SOLUTIONS

SECTION A: Multiple-choice questions (1 mark each)

Question 1

Answer: C

Explanation:

Philosophers in the brain and heart debate argued over which organ was primarily responsible for thinking, mental processes and feelings; the heart or the brain. The brain hypothesis is the assertion that the brain was responsible for thought.

Question 2

Answer: A

Explanation:

Empedocles supported the heart hypothesis in the ancient heart and brain debate. He asserted that the soul was encased in blood and was hence responsible for our thoughts, perceptions, feelings and emotions.

Question 3

Answer: D

Explanation:

Phrenology is the field of study which investigates bumps and lumps on the skull. In this field of study, it is thought that more developed parts of the brain pushed out areas of the skull and thus could be felt to determine character traits.

Question 4

Answer: B

Explanation:

Ablation is the process of removing or destroying brain tissue by surgical means or by using electrodes.

Question 5

Answer: C

Explanation:

Karl Lashley is responsible for the idea of mass action. He was searching for the part of the brain in Chimpanzees that was responsible for learning and memory. He didn't find a specific part and instead concluded it was spread throughout the brain. Mass action is the idea that complex functions are performed by multiple different brain regions acting as a whole.

Question 6

Answer: B

Explanation:

The brain imaging techniques that only show structure are Computerised Tomography and Magnetic resonance imaging. Functional magnetic resonance imaging and positron emission tomography show the brain's current consumption of oxygen (fMRI), blood flow (PET) and glucose usage (PET). Monitoring blood flow, oxygen and glucose (food energy) usage allows measurement of the brain's active functioning. fMRI and PET also show structure in addition to showing the active functioning of the brain.

Question 7

Answer: D

Explanation:

Neurotransmitters travel over the synapse towards the post-synaptic neuron's receptors. These receptors are located on the post-synaptic neuron's dendrites.

Question 8

Answer: B

Explanation:

The autonomic nervous system is responsible for connecting the central nervous system (brain and spinal cord) to the body's organs and glands.

Question 9

Answer: A

Explanation:

The reticular formation is located in the midbrain.

Question 10

Answer: D

Explanation:

The corpus callosum connects the left and right cerebral hemispheres together. The corpus callosum is a membrane that has many nerve bundles and is located between the two hemispheres. It allows communication between the two hemispheres.

Question 11

Answer: B

Explanation:

The temporal lobe is responsible for processing auditory information. The primary auditory cortex resides here.

Question 12

Answer: B

Explanation:

Synaptic pruning is a type of neuroplasticity. Synaptic pruning is best defined as the elimination of unused synapses.

Question 13

Answer: C

Explanation:

Long-term potentiation, long-term depression and synaptogenesis are all processes the brain uses to change itself over time. Mental stimulation itself is not a form of neuroplasticity; instead it is an activity that encourages neuroplasticity processes within the brain.

Question 14

Answer: B

Explanation:

It is easier for Tammy to relearn how to play the piano because she already has a neural network related to her skill of playing the piano. While she was not playing, the network may have been pruned to some degree (long-term depression) but it will still exist. As it still exists, she is able to re-strengthen the pathways for the skill that were previously there rather than creating an entirely new network for learning how to play the saxophone.

Question 15

Answer: A

Explanation:

A Traumatic brain injury (TBI) is defined as a brain injury resulting from physical trauma. The physical trauma or impact is usually sudden, e.g., car accident.

Question 16

Answer: B

Explanation:

Damage to Broca's area can cause difficulties in producing fluid speech.

Question 17

Answer: A

Explanation:

Damage to Wernicke's area can result in difficulties understanding speech and producing sentences that have meaning.

Question 18

Answer: D

Explanation:

Diagnosis of epilepsy through the measurement of electrical activity in the brain is done using an EEG; Electroencephalograph. Electrical activity patterns of individuals without epilepsy are compared to an individual in question (which is thought to have epilepsy).

Question 19

Answer: C

Explanation:

Implants (e.g. vagus nerve stimulator and deep brain stimulator) send repeated electrical signals to the brain. This process increases the levels of blood flow, changes the neural pathways being used, raises neurotransmitter levels and helps to change the brain's electrical activity.

Question 20

Answer: B

Explanation:

There are four stages of CTE. Each stage is associated with increasingly severe symptoms and relates to the amount of degeneration the brain.

Question 21

Answer: B

Explanation:

The ability to understand that objects can transform state or form is achieved in the pre-operational stage of Piaget's model.

Question 22

Answer: C

Explanation:

Object permanence is the ability to understand that objects still exist even if they cannot be touched, seen or heard. An example of this is an object being put under a towel. Infants who don't yet understand this think the object doesn't exist anymore.

Question 23

Answer: B

Explanation:

A phenotype is the way that your genotype is expressed through interaction with the environment. A genotype is the entire set of genes you have received from your parents.

Question 24

Answer: A

Explanation:

Hereditary factors are pre-determined characteristics or attributes that are passed on through genes. These factors change based upon interaction with the environment. Certain characteristics may or may not be triggered (or to differing degrees) by interaction with the environment.

Question 25

Answer: A

Explanation:

Risk factors in the biopsychosocial model refer to biological, social and psychological factors that increase the chance of developing a mental disorder or maladaptive behaviour.

Question 26

Answer: C

Explanation:

Stacy is likely to have a mental health problem. A mental health problem is a fairly short-term disruption to everyday functioning. At present she is mildly impacted by her symptoms. Her concerns have also just recently started.

Question 27

Answer: C

Explanation:

The infant's attachment style is Insecure-avoidant. In this attachment style an infant is generally distant and seeks little contact with their caregiver. When the infant's caregiver leaves, the infant is not distressed. The infant can also avoid contact with the caregiver.

Question 28

Answer: D

Explanation:

Modelling is defined as learning that involves observing others' actions and the consequences of those actions. It also involves replicating the observed behaviour.

Question 29

Answer: A

Explanation:

The aim of Gibson's and Walks visual cliff experiment was to determine what age infants could perceive depth.

Question 30

Answer: D

Explanation:

The completed sentence reads: There are 3 levels and 6 stages of Kohlberg's moral development theory. The levels include: pre-conventional, conventional and post-conventional. There are two stages per level.

Question 31

Answer: A

Explanation:

The second stage of Kohlberg's moral development theory belongs to the pre-conventional level. The pre-conventional level is theorised to be attained in childhood (stages 1-2).

Question 32

Answer: B

Explanation:

Autism is often associated with difficulties understanding social and emotional cues. Those with autism often tend to have a low central coherence (focus on details) not a high central coherence (focus on bigger picture). 'Theory of mind' whilst being a concept that is related to autism is not

a 'proper' answer because it does not state what type of relationship theory of mind has to autism and thus is just a statement.

Question 33

Answer: C

Explanation:

Psychologists and psychiatrists are both able to administer psychological therapies.

Question 34

Answer: B

Explanation:

Deficits in the ability to perceive others' mental states (theory of mind) is a symptom that belongs to autism and not ADHD.

Question 35

Answer: D

Explanation:

A and B are the correct answers. Mental health organisations provide low cost services that can be used in areas that lack resources.

Question 36

Answer: B

Explanation:

A headache after a brain injury is the only biological answer among the possible answers. C and D are psychological and A is social.

Question 37

Answer: A

Explanation:

Brain injuries can result in individuals finding it difficult to relate to other people especially if damage is done to areas responsible for emotions, impulse control and language processing.

Question 38

Answer: D

Explanation:

Epilepsy is more common in young children and older adults than the rest of the general population.

Question 39

Answer: D

Explanation:

Neurotypicality is defined as standard brain functioning, thus D the mean (average) is the correct answer.

Question 40

Answer: C

Explanation:

Statistical rarity is most likely to be reflected by an outlier. The other measures show: the average (which is most likely going to be somewhere in the middle of the dataset), the median (which is the middle value in a dataset), mode (the most frequent score in a dataset). An outlier is a score that is far away from other scores in a dataset.

SECTION B: Short and extended answer questions

Question 1

An extraneous variable is a variable that is not the independent variable but may have an effect on the dependent variable in an unwanted manner. A controlled variable is an extraneous variable that has been controlled, removed or accounted for within an experiment and will no longer affect the dependent variable.

2 marks

Question 2

CTE is difficult to diagnose while a person is alive. This is because there is a lack of bio-markers and measurable indicators for CTE. Brain scans can be used on a person who is alive, however CTE shares similar physical changes and symptoms with other neuro-degenerative diseases such as Alzheimer's. This means it is hard to specifically diagnose an individual with CTE.

2 marks

Question 3

a. An introduction will include:

- General background information on the topic of the report. This includes a literature review on past research. This leads into a rationale for the current study
- A statement of the aim for the current study
- A hypothesis for the current study
- Statement of variables and definition of those variables

4 marks

b. The methodology section includes:

- A description of participants (including the population and sampling techniques)
- Materials used (such as a type of test)
- Procedure of the study (how the study was carried out)

3 marks

Question 4

An acquired brain injury is a blanket term that is used to describe any brain damage that occurs after birth, whereas a traumatic brain injury is a more specific term relating to brain damage as a result of physical trauma or impacts.

2 marks

Question 5

An infant aged 0-2 is in Piaget's sensorimotor stage. An infant in this stage has not yet understood the concept of object permanence. Object permanence is the ability to understand that objects don't disappear if they can't be seen for a moment. Peekaboo is exciting for an infant this age because the person doing peekaboo is thought to actually disappear and reappear.

4 marks

Question 6

- a. ZPD stands for zone of proximal development. (1 mark)
- b. The first layer is what a child can do by themselves. The second layer is what a child can do with assistance (tools, training, advice). The third layer is what is beyond the child's capabilities even with help or tools. (3 marks)
- c. A child's potential is between the first layer (what they can do now) and the second layer (what they can do with help). (1 mark)
- d. Scaffolding is the support or assistance given to extend and develop a child's skills (e.g., cognitive skills). (1 mark)
- e. An example of scaffolding is providing a child a calculator. This increases their ability to calculate sums. (1 mark)

Question 7

- a. Trust versus mistrust. Industry versus inferiority, Integrity versus despair. (3 marks)
- b. Trust versus mistrust (0-2; infancy). Industry versus inferiority (6-puberty; childhood). Integrity versus despair (65+; older adulthood). (3 marks)

Question 8

-A correlational study and an experiment both test the relationship between two or more variables.

-A correlational study tests the relationship between two variables but does not manipulate or control those variables.

-An experiment however, manipulates an independent variable to determine if it has an effect on a dependent variable.

-An experiment generally has more control over its variables than a correlational study.

-An experiment can claim a cause and effect relationship between variables (that manipulating the IV changed the DV) but a correlational study can only suggest a relation.

5 marks

Question 9

- a. A case study is an investigation of a specific behaviour, person, small group, event or issue. A case study usually involves a specific, small sample size. A case study is an in-depth investigation that includes rich real-world complexities. (2 marks)
- b. A case study is good for investigating situations that would be unethical to investigate in other ways (e.g., experiment) as the phenomenon under investigation cannot be ethically manipulated. A case study also is useful in situations where few participants are available such as when investigating rare phenomena or conditions. (2 marks)
- c. Domestic abuse, experiences of drugs and rare diseases. (3 marks)

Question 10

- a. The spiritual dimension, the social dimension and physical dimension. (3 marks)
- b. Indigenous Australians view the physical body as being closely linked to land. (1 mark)

Question 11

- a. Maladaptive behaviours are behaviours that interfere with a person's functioning, are unhelpful and are not productive. (1 mark)
- b. Sometimes maladaptive behaviours can be used as a way to cope with anxiety. (1 mark)
- c. Low impairment example: Lightly tapping self when something bad happens
High impairment example: Avoiding friends and family for a week when something bad happens, substance abuse. (2 marks)

Question 12

Neurotypicality is a term that describes 'normal' or standard brain functioning. 'Normality' refers to the level of 'averageness' that certain traits or behaviours have. This could also be emotions or levels of distress experienced. Normality can be determined by such factors as statistical rarity, culture, social norms and distress levels. Neurotypicality on the other hand is the expected brain functioning of an individual and relates to age developmental milestones. Neurotypicality can be viewed as the neurological version of normality. If someone rates within average parameters on scores of normality for their age, developmental phase and behaviours it is likely that their brain functioning will be neurotypical.

5 marks (1 per point)

Question 13

Discussion section

The results show a small difference in scores on the logical reasoning test between the high impairment group and the low impairment group. On average there is a five-point difference between the two groups.

I would not support the hypothesis that those who have high ratings of impairment are more likely to score lower on ratings of logical reasoning than those who have low ratings of impairment. There are a few issues with this study that disrupt its internal validity. The main problem with this study is the decision to use participants' self-ratings of level of impairment. Cognitive impairments may not be noticeable to those with traumatic brain injuries. Thus, asking participants to rate their level of impairment may not be the most accurate way to ascertain their true level of impairment. Instead, using a multitude of cognitive tests is a more accurate way to determine their level of impairment. Instead of asking participants to self-rate, Dr Smith could have used a control group (with individuals who don't have TBIs) as a comparison. Additionally, Dr Smith could have used the severity of injury sustained as an objective way to group participants into low and high impairment.

Additionally, the participant selection method arguably makes it more likely that Dr Smith will gather those who have a higher level of impairment. Arguably, visiting a homeless shelter and a mental institution is likely to yield participants who have already experienced long-term losses as a result of their TBIs. Those who need full time care at a mental institution or have become homeless as a result of their TBI are likely to be experiencing severe cognitive deficits amongst other behavioural symptoms and social issues. The small difference between groups could have been a result of poor sampling techniques. If Dr Smith yields participants all with a fairly high level of impairment this arguably reduces the effectiveness of participants' rating their own level of impairment.

Those in hospital may be experiencing acute (short-lasting) symptoms and have such deficits as short-term memory loss or disorientation. These short-term symptoms are not equal to longer-term deficits. Dr Smith could fix this by setting some parameters like length of time after injury so he can ensure he is measuring a consistent concept (i.e. brain injury directly after injury or long term brain injury). Muddling up both types of participants does not yield results that are useful and disrupts the internal validity of the experiment.

Whilst Dr Smith offered participants \$50 upon completion of the study, he is still doing research with particularly vulnerable groups. He is providing them with a benefit but after the monetary incentive they are not really receiving any benefits from being in the study. Potentially Dr Smith can also provide participants with some sessions of mental stimulation (particularly for those in hospital because neuroplasticity is highest 1-4 weeks after a brain injury). If he offers mental stimulation sessions as part of the study participants can directly benefit from the study. Additionally, with this change in study design, he can re-test them with the reasoning test multiple times.

This study implies that those with TBIs do not have an accurate self-rating of impairment. Future research could either classify participants more objectively in terms of impairment (brain imaging, severity of injury). Additionally, future research could set a time period of interest (short-term TBIs or long-term TBIs) and ensure inclusion of those who have low-impairments as well as those who have higher impairments. It could be that those who have low impairments are living in the wider community and are not able to be sampled by visiting the institutions that Dr Smith did.

1 mark for stating the results

1 mark for agreeing or disagreeing with the hypothesis and stating it correctly

5 marks for discussing points related to study strengths and limitations, ethics or the concept of brain injury. There must be more than one type of discussion topic (aka not just all on brain injury or ethical limitations).

1 mark for stating an implication

2 marks for stating at least two future research options