

PSYCHOLOGY

Units 3 & 4 – Written examination



2016 Trial Examination

SOLUTIONS

Section A – Multiple-choice

Question 1

Answer: C

Explanation:

Throughout childhood and adolescence, the myelin sheath grows around the axon, insulating them and making neural transmission more efficient.

Question 2

Answer: A

Explanation:

Migration refers to the process whereby neurons move to their final location in the CNS and the locations determine what their functions will become.

Question 3

Answer: B

Explanation:

Proliferation includes the division and multiplication of cells that will become neurons, creating approximately 250 000 cells per minute.

Question 4

Answer: A

Explanation:

Max would demonstrate beta-like waves as he is experiencing REM; Henry would display alpha waves whilst daydreaming.

Question 5

Answer: C

Explanation:

When sleep deprived we tend to catch up on REM sleep and deep sleep we have missed.

Question 6

Answer: D

Explanation:

Both day and night dreaming involve a decrease content limitation, decrease time orientation, lack of awareness of external events.

Question 7

Answer: A

Explanation: EMG detects, amplifies and records the electrical activity of the muscles.

Question 8

Answer: B

Explanation:

The right parietal lobe is the most likely area of brain damaged when suffering spatial neglect.

Question 9

Answer: D

Explanation:

They may only eat food on the right side of the plate (not C since the problem is attentional NOT visual).

Question 10

Answer: D

Explanation:

The fact that Sarah did not see the obstacle is most likely a result of lack of awareness of external events.

Question 11

Answer: D

Explanation:

Failure to recognise people (e.g. facial agnosia) is most likely a result of damage to the temporal lobe.

Question 12

Answer: B

Explanation:

Wernicke's aphasia results in difficulty in producing meaningful speech.

Question 13

Answer: C

Explanation:

Motor neurons take information 'away from' the CNS.

Question 14

Answer: B

Explanation:

Localisation refers to the fact that specific areas of the brain are responsible for specific functions.

Question 15

Answer: B

Explanation:

The sympathetic nervous system is responsible for stimulating the fight/flight response in the body.

Question 16

Answer: A

Explanation:

Frontal lobe would have made the decision that the cup was too hot to hold.

Question 17

Answer: C

Explanation:

Afferent (sensory) neurons would have sent the message via ascending tracts to the primary somatosensory cortex in the parietal lobe.

Question 18

Answer: A

Explanation:

Information presented to the left eye will be processed in both occipital lobes.

Question 19

Answer: A

Explanation:

Damage to the amygdala results in failure to experience fear conditioning.

Question 20

Answer: B

Explanation:

The cerebellum is involved in procedural skills and memories.

Question 21

Answer: D

Explanation:

Damage to the hippocampus results in problems with forming new declarative memory.

Question 22

Answer: A

Explanation:

Paul is suffering anterograde amnesia.

Question 23

Answer: D

Explanation:

The cerebellum & basal ganglia are collectively involved in processing procedural memories

Question 24

Answer: A

Explanation:

Mental illness is said to involve distress, dysfunction & atypical behaviour

Question 25

Answer: A

Explanation:

Independent groups design was used.

Question 26

Answer: A

Explanation:

The tablet containing no medication was the placebo in this study.

Question 27

Answer: C

Explanation:

$P < 0.05$ means that there is less than 5% probability the results occurred due to chance

Question 28

Answer: B

Explanation:

Random allocation ensures each participant is given an equal chance to be in the experimental or control group

Question 29

Answer: A

Explanation:

Stress depletes the immune system and the functioning of white blood cells

Question 30

Answer: B

Explanation:

Echoic memory has a duration of up to a few seconds.

Question 31

Answer: A

Explanation:

Repression refers to the unconscious motivation to block a memory that is traumatic.

Question 32

Answer: D

Explanation:

Decay theory has nothing to do with age and decay can occur at any time during the lifespan.

Question 33

Answer: C

Explanation:

Lack of consolidation implies the memory was never stored to begin with.

Question 34

Answer: B

Explanation:

Neurofibrillary tangles occur within the neuron.

Question 35

Answer: A

Explanation:

The thought of going on holiday is the CS.

Question 36

Answer: B

Explanation:

Being bitten by a poisonous spider was the UCS.

Question 37

Answer: D

Explanation:

Fear of a holiday is the CR.

Question 38

Answer: C

Explanation:

Stimulus discrimination occurred, as she only feared holidays with her family.

Question 39

Answer: B

Explanation:

Graduated exposure involves exposure therapy via successive approximations.

Question 40

Answer: B

Explanation:

Fixed interval since the learner quickly realises there is little point making a response unless the time indicates a reward is due. Hence, no responses may be made for a long period of time, followed by many responses when the reward is due.

Question 41

Answer: C

Explanation:

The learner will very quickly realise that each response has the potential to be rewarded.

Question 42

Answer: A

Explanation:

The honey bee waggle dance is an example of a fixed action pattern (species specific)

Question 43

Answer: C

Explanation:

Secondary appraisal involves evaluating our coping resources.

Question 44

Answer: D

Explanation:

The current version is the DSM – V (DSM-5).

Question 45

Answer: D

Explanation:

All are benefits of a dimensional approach

Question 46

Answer: C

Explanation:

The DSM provides more detail concerning features such as the course and prevalence of a disorder compared to the ICD.

Question 47

Answer: D

Explanation:

NREM stage 4 sleep has at least 50% delta waves; whereas NREM stage 3 sleep has 20-50% delta waves

Question 48

Answer: B

Explanation:

Myelination is involved in developmental plasticity only, rerouting is part of adaptive plasticity.

Question 49

Answer: C

Explanation:

Jess is experiencing hypnic jerks

Question 50

Answer: A

Explanation:

Sleep somnambulism is a term used to describe unusual sleep phenomenon such as sleep walking.

Question 51

Answer: A

Explanation:

Jess is likely to be in light sleep (NREM stage 1) and Tristan is likely to be in deep sleep (NREM stage 4)

Question 52

Answer: A

Explanation:

Mood swings is an affective/emotional symptom.

Question 53

Answer: A

Explanation:

Functional approach abnormality is indicated by the existence of maladaptive behaviour?

Question 54

Answer: B

Explanation:

Unusual brain biochemistry would be in line with the medical approach.

Question 55

Answer: B

Explanation:

Studying Chinese after the French material may have acted as retroactive interference

Question 56

Answer: C

Explanation:

Charlotte has not worked well all year and is distracted. She has most likely been unable to consolidate the information.

Question 57

Answer: D

Explanation:

Decay may have occurred as he completed his VCE 5 years ago.

Question 58

Answer: C

Explanation:

REM sleep assists memory consolidation

Question 59

Answer: D

Explanation:

Dimensional approaches do not use clearly defined categories of mental illness

Question 60

Answer: D

Explanation:

All A to C are correct.

Question 61

Answer: D

Explanation:

A stopwatch is NOT a biofeedback device

Question 62

Answer: A

Explanation:

Meditation, relaxation, denial are emotion focused strategies

Question 63

Answer: B

Explanation:

Focused attention, divided attention, daydreaming, sleep, anaesthetized, coma indicates the continuum of awareness from heightened awareness to complete lack of awareness.

Question 64

Answer: C

Explanation:

Threat - An assessment that there may be future harm/loss

Question 65

Answer: A

Explanation:

Challenge - An assessment if there is opportunity for personal growth

SECTION B - Short-answer questions

Question 1

a. The association area of the left temporal lobe includes all areas that are not part of the predominant primary cortex (left primary auditory cortex) within the temporal lobe. Hence, areas such as the Wernicke's area is indeed an association area. The function of Wernicke's area is to enable the production of meaningful speech and enable comprehension of the speech of others. Association areas in the temporal lobe also have a key role in the consolidation of long-term memories.

2 marks

b. Luke may have problems producing meaningful speech and interpreting others if the Wernicke's area is affected. Alternatively, if other areas are affected then the ability to form new LTM's may be affected.

Question 2

Graded refers to the fact an individual's severity of a mental illness or symptoms can be graded/scored in terms of severity. This gives us more info about the patient & treatment can be tailored according to severity.

However, transitional approaches recognise patients condition/mental illness can get worse or better overtime & we can tailor/change treatment accordingly.

2 marks

Question 3

a.

MODEL



ATTENTION

Learner pays attention in order to observe the modelled behaviour. Lara may have been paying attention and watching Jacky as they are close friends.



RETENTION

Learner mentally represents and retains what has been observed. As this is quite an usual event for Lara she is likely to have maintained and formed a mental representation of the event whereby Jacky was bitten by a dog



REPRODUCTION

Depending on physical capabilities, the learner converts the mental representations into actions. Demonstrating fear of a dog is well within Lara's physiological and cognitive capabilities.



MOTIVATION-REINFORCEMENT

Reinforcement influences motivation to perform the learned behaviour. Lara is perhaps motivated by the fact that she is avoiding being bitten by a dog (negative reinforcement)

Each stage must be appropriately applied to the scenario to receive the full 4 marks.

4 marks

b.

Accept explanations of flooding or graduated exposure.

Example:

- Graduated exposure involves using exposure/bringing the person into contact with a fear to eliminate a phobia of a feared object (Lara would have to be presented with a dog).
- Graduated exposure involves very gradual successive approximations to the feared object, this is usually in the form of a hierarchy of fears whereby Lara will firstly be exposed to stimuli she finds less frightening (such as a photograph) of a dog to more frightening stimuli (such as having to be in the same room as several dogs).
- Graduated exposure is said to have been effective when the CS (dogs) no longer produce the CR (fear).

There must be full application to the scenario for full marks.

3 marks

Question 4**Key differences between fixed ratio and fixed interval schedules of reinforcement**

	Description	Example	Extinction rate
Fixed Ratio	Reinforcement is given after a set number of correct response	Coffee reward card – having a free coffee after purchasing 10.	Fairly rapid compared to variable schedules. Less rapid than fixed interval.
Fixed Interval	Reinforcement is given after a fixed/set period of time.	Fortnightly pay	Rapid

3 marks

Question 5

Developmental plasticity refers to the changes that occur in neurological structure as a result of growth and development.

Adaptive plasticity refers to changes in neural structure and function as a result of learning and/or injury.

Examples of adaptive plasticity – sprouting & rerouting. Dendritic branching/sprouting involves the dendrites becoming bushier so that they can connect & receive information more efficiently from other neurons and strengthen the connection at the point of the synapse.

Rerouting - An undamaged neuron that has a lost connection with an active neuron, may seek a new active neuron and connect with it instead. Consequently, rerouting around the damaged area.

Examples of developmental plasticity – migration & myelination. Migration refers to neurons moving to their final location in the CNS and this location determines what their function will become.

Myelination is a process in the brain whereby the axons of neurons in a child's brain become covered in myelin, a white, fatty covering that insulates the neuron's axon and speeds transmission. This process occurs until the early 20's. Thus, it is an example of developmental plasticity.

4 marks

Question 6

Accept any suitable difference. For example, CC is involuntary, passive and responses are largely initiated by the ANS. However, OC response are voluntary, active and initiated by the CNS.

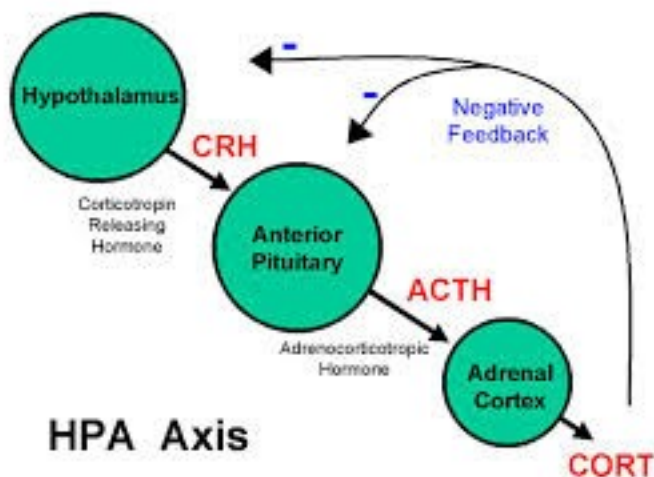
2 marks

Question 7

a. HPA axis response

- **HPA AXIS** – This is the chain of reactions in the physiological response to stress involving the Hypothalamus, Pituitary gland and the Adrenal glands (outlined below).
- when a threat is perceived the **hypothalamus** is activated - Paul's parents death and divorce proceeding would be events that would be perceived as stressful by the hypothalamus
- the hypothalamus (lower brain structure) stimulates the nearby **pituitary gland**
- the pituitary gland then secretes (releases) the hormone called **ACTH (adrenocorticotrophic)**.
- ACTH travels through the bloodstream and stimulates the **adrenal glands** (located just above the kidneys).
- When the adrenal glands are stimulated they release the stress hormones, adrenaline (epinephrine) and noradrenaline (norepinephrine) & cortisol. These additional stress hormones will stimulate the fight/flight response and perhaps provide Paul with the energy reserves he needs to cope with the additional stressors in his life. However, with prolonged exposure to these stress hormones, Paul's immune system may not function effectively.
- These hormones will boost activity of the sympathetic branch.

Must be application to Paul for the full 6 marks



6 marks

b. Paul is experiencing the following social stressors – stressful life events (death of a loved one, marital breakdown), social isolation, increased workload.

Paul would benefit most from social support as he is isolated to some degree – Social support is help or assistance from other people when needed. The people who provide social support can vary from a network of family, friends, neighbours, and the community. Additionally, the nature of the support can also vary from emotional, physical and financial assistance. Social support may take the form of appraisal support, emotional support, tangible support or informational support. For example, a colleague might provide tangible support by taking some of his workload.

6 marks

c.

Accept any suitable examples for each.

Psychological symptoms:

- lack of concentration
- lack of motivation
- moodiness
- short term memory can be impaired
- hallucinations, delusions and paranoia e.g. disc jockey Peter Tripp who was awake for 8 days
- decline in ability to perform cognitive tasks
- slower reaction times

Physiological symptoms:

- sleepiness and fatigue
- hand tremors
- drooping eye lids
- lack of energy
- lack of strength
- slurred speech
- increased sensitivity of pain

4 marks

Question 8

Allostatic load refers to the cumulative effect of our body trying to re-establish allostasis in response to frequent and intense stressors. However, allostatic overload is when the demands of the stressor exceed the body's ability to repeatedly adapt, the person is no longer able to meet demands. Hence allostatic load can become allostatic overload if we are unable to turn the allostatic response off and return to a resting state.

3 marks

Question 9

Strengths – The evolutionary theory is supported by a body of research involving animal studies.

Lions, Tigers and gorillas:

These animals typically sleep for 15 hours per day as they have few predators so do not need to be alert to potential danger. Their metabolism allows them to sleep for extended periods

Horses, cows, zebra & buffalo:

These animals have many predators and struggle to escape from predators. They cannot hide easily, climb trees or burrow quickly to escape danger. Thus, they are safer to stay awake and only tend to sleep for short periods that total 4 hours per day. These animal's metabolism require them to constantly graze.

Possums and bats:

Eat less food and need time to find and digest food. They are also able to sleep in a safe place away from natural predators (burrows). Thus, they do not need to be awake for long periods each day or spend time safeguarding against predators. A possum can sleep for up to 19 hours per day and a bat for 20 per day.

Criticism of the evolution theory:

Accept any suitable critic, such as those identified below:

- Does not explain why sleep involves a loss of awareness, since loss of consciousness may place an organism at greater risk as they are not ready to respond to danger. During sleep our sense are less aware of external events (e.g. an intruder) and muscles are in a very relaxed state and not ready to respond to danger, this is particularly so in NREM 3 & 4 when we are very unresponsive to external stimuli. Also during REM we are virtually paralysed so may not be able to respond to an intruder immediately.
- Some argue the theory is less relevant today as humans have access to lighting, 24-hour food stores and fridges that keep food fresh. However, there are still potential threats we face when out at night that are not present in the day.
- Additionally, much of the evidence is from animal sleeping patterns which may be less applicable to a theory of human sleeping patterns.

2 marks

Question 10

Anterograde amnesia involves loss of memory only for events after the person sustains the damage. The memory for events prior to the injury is still functioning. **Retrograde amnesia** affects memory for events that occurred before the person sustains the damage. It may extend a few moments, days or years.

3 marks

Question 11

Complete the table in relation to Atkinson and Shiffrin's multi-store model of memory

	Sensory Memory	Short Term Memory	Long Term Memory
Duration	0.2-0.4 seconds for iconic 3-4 seconds for echoic	18 seconds on average (15-30 seconds)	Unlimited
Capacity	Relatively unlimited	7 plus or minus 2	Unlimited

3 marks

Question 12

EOG is a device that detects, amplifies and records electrical activity of the muscles that control eye movements. During light sleep the EOG may demonstrate the eyes rolling slowly. During deep sleep there will be little electrical activity of the muscles that control eye movement. Frances may have had more deep sleep so experienced less eye movement overall than Lance.

EMG – EMG is a device that detects, amplifies and records electrical activity of bodily muscles. During light sleep EMG may reveal hypnic jerks. During deep sleep there will be little electrical activity of the muscles that control the body. Lance reports more light sleep so may have experienced more hypnic jerks than Frances.

EEG is a device that detects, amplifies and records electrical activity of the brain in the form of brain waves. At the beginning of NREM stage 1 a person may show alpha waves – the remainder of light sleep will be largely theta waves. Sleep spindles and K-complexes may also occur in light sleep. Deep sleep would be indicated by the presence of theta and delta brainwaves. Thus, Frances may have had more delta waves than Lance.

6 marks

Question 13

Accept any two suitable suggestions – Lack of motivation, lack of confidence, slowing down of the CNS.

2 marks

Question 14

Descriptive statistics simply describe the data (e.g. the mean) and do not allow us to draw conclusions. Inferential statistics involves detailed statistical analysis and a p-value. We can draw conclusions from inferential statistics.

3 marks

SECTION C – Extended response question

Question 1

Participants who are given questions about physical features of the word and sound of the word will use maintenance rehearsal. However, those who answer questions about the semantic meaning of the word will use elaborative rehearsal.

2 marks

Question 2

Stratified sampling was used since a selection of students were selected to represent each sub-group of varying abilities. We can draw conclusions regarding the generalisability of these results since a stratified sample is fairly representative as participants were selected from different sub-groups in terms of academic ability.

3 marks

Question 3

Implications for existing research:

The findings from this study support the work of Craik and Lockhart since elaborative rehearsal led to higher recall than maintenance rehearsal. Participants who processed words semantically demonstrated the highest recall. Participants who processed words phonetically recalled more than those who processed words structurally but less than those who processed words semantically. This is in line with Craik and Tulving's findings that structural processing is the most shallow form of processing and semantic processing is the deepest form of processing.

Conclusion:

The results are said to be statistically significant and therefore we can accept the hypothesis that information processed deeply will be recalled more easily than information processed on a more shallow and superficial level. The probability of the results occurring as a result of chance is less than the significance level set by the researcher.

Limitations and Modifications:

A matched pairs design was used and this includes a number of limitations.

Firstly, attrition may occur whereby there may be a rapid loss of participants. If one participant drops out of the study it may be necessary to also exclude their match, thus two participants will be lost. Additionally, although some participant variables have been controlled, some will still exist. Thus the design does not completely eliminate participant variables as a repeated groups design would. Also double the amount of participants are needed compared to a repeated groups design and it can be time consuming to find matches.

A suitable modification may therefore be to use repeated groups. This is because participant variables will be completely eliminated since the participants take part in both the control and experimental condition. This also means less participants overall will need to be collected and it will not be time consuming to find matches for each participant.

A potential extraneous variable in this study may have been how well rested the participants were at the time of the study. If they were fatigued, this may have influenced their performance on the memory task, rather than the level of processing. This could have been controlled by including this as a factor participants were matched on or excluding participants that reported lethargy from a pre-test.

10 marks