

VCE Psychology Units 3&4

Written Examination

Suggested Solutions

SECTION A – MULTIPLE-CHOICE QUESTIONS

1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
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15	A	B	C	D
16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
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26	A	B	C	D
27	A	B	C	D
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43	A	B	C	D
44	A	B	C	D
45	A	B	C	D
46	A	B	C	D
47	A	B	C	D
48	A	B	C	D
49	A	B	C	D
50	A	B	C	D

Question 1 D

D is correct. The hypothalamus, which is located in the brain and thus is part of the central nervous system, responds to a threat by activating the sympathetic nervous system. This triggers a fight-flight-freeze response. **A** is incorrect. The parasympathetic nervous system helps counteract the effects of the stress response after a threat has passed. **B** and **C** are incorrect. The autonomic division of the peripheral nervous system provides feedback to the brain about the activity of organs, glands and other parts of the body to regulate the body's internal functioning.

Question 2 D

D is correct. An unconscious response to sensory stimuli can be initiated by the central nervous system or the peripheral nervous system. An example of an unconscious response initiated by the central nervous system is a spinal reflex. An example of an unconscious response initiated by the peripheral nervous system is a response to a stressor that activates the sympathetic nervous system (which is part of the peripheral nervous system).

Question 3 C

C is correct. Alzheimer's disease is a result of the formation of amyloid plaques between hippocampal neurons. This interferes with the communication between the axon terminals on the presynaptic neurons and the dendrites on the postsynaptic neurons.

Question 4 A

A is correct. Medication used for treating the most commonly observed symptoms of Parkinson's disease (for example, impaired motor functioning) typically act as dopamine agonists that mimic the effects of dopamine at the (dopamine) receptor sites in the motor areas of the brain. This is to address the depletion of dopamine neurotransmitters resulting from the degeneration of the cells that produce dopamine in the substantia nigra. **B** is incorrect. The presence of tau protein is a neural cause of Alzheimer's disease (not Parkinson's disease). **C** is incorrect. The strength of skeletal muscles is not the source of the motor impairment that people with Parkinson's disease experience; the loss of motor control is due to a lack of input to the motor areas of the brain. **D** is incorrect. The interneurons of the brain are not directly involved in motor control.

Question 5 C

C is correct. In terms of the lock-and-key process, the medication in the study will act as a 'key' by mimicking the effects of dopamine on the target receptors (the 'locks') and thus increase the excitability of the postsynaptic cells that play an important role in motor control. **A** is incorrect. A dopamine agonist does not increase the ability of neurons to produce dopamine. **B** and **D** are incorrect. A dopamine agonist does not target reuptake channels, which are located on the presynaptic neuron; they target the uptake channels, which are located on the postsynaptic cells.

Question 6 C

C is correct. Tim's recent diagnosis of Parkinson's disease would least likely be classified as acculturative stress, which refers to the stress experienced when an individual tries to adapt to a new culture. **A** is incorrect. The diagnosis would have triggered a negative psychological response (distress); for example, Tim would have been upset. **B** and **D** are incorrect. Diagnosis of a neurodegenerative disease (a major stressor) would have been extraordinarily stressful for Tim and would require him to adapt his lifestyle (a life event).

Question 7 C

C is correct. Tim directing his energy away from the source of the stress of the diagnosis, in this case towards a building project, would be an example of an avoidance coping strategy. **A** and **D** are incorrect. Using context-specific effectiveness and searching for support groups are both indicative of an approach strategy – they deal with the source of the problem. **B** is incorrect. A secondary appraisal is an evaluation of coping resources, which comes before coping with the stressor begins.

Question 8 A

A is correct. In terms of Lazarus and Folkman's Transactional Model of Stress and Coping, a secondary appraisal is required when a stressor has been appraised as significant. A secondary appraisal enables an individual to evaluate their coping resources to manage the stressor. A spinal reflex is a simple, rapid, protective response to a harmful stimulus; thus, after the reflexive withdrawal of the individual's body from the stimulus, there is no conscious evaluation of the ability to cope with the stressor. **B**, **C** and **D** are incorrect. A major stressor, a life event or acculturative stress are all appraised as significant stressors.

Question 9 B

B is correct. The activities of the parasympathetic nervous system and the sympathetic nervous system counterbalance each other; the parasympathetic division is dominant during times of low stress, and the sympathetic nervous system becomes dominant when the body is under threat. **A**, **C** and **D** are incorrect. Both divisions are always active; they are not 'switched off' at any time.

Question 10 C

C is correct. In comparison to the body's stress response, a spinal reflex is a more simplistic single movement that occurs rapidly and automatically (without conscious awareness) as a protective response that can be observed in the form of a sudden movement.

Question 11 C

C is correct. Dendrites can form new branches as a result of synaptic plasticity in response to learning (long-term potentiation). **A**, **B** and **D** are incorrect. The axon, soma and neurotransmitters do not increase in mass.

Question 12 B

B is correct. Anterograde amnesia is a common symptom of Alzheimer's disease; this is due to the degeneration of the cells in the hippocampus, which results in difficulty consolidating new explicit memories. **A**, **C** and **D** are incorrect. People who experience mental health problems, people who have Parkinson's disease and sleepwalkers do not typically experience anterograde amnesia as a result of their condition.

Question 13 B

B is correct, and **A** and **C** are incorrect. When the antecedent of the offer/invitation to join colleagues for drinks was presented to Amaya, her behaviour was to make up an excuse to avoid the consequence of the feelings of illness that result from drinking alcohol. **D** is incorrect. A classically conditioned response does not apply to the three-phase model of operant conditioning.

Question 14 A

A is correct and **B** is incorrect. Light-headedness is an added effect of drinking that will decrease the likelihood of an individual drinking excessively in the future; thus it acts as a form of positive punishment. **C** and **D** are incorrect. A reinforcer would strengthen behaviour, which is not the case in this scenario.

Question 15 D

D is correct. Amaya's light-headedness was an unconditioned response elicited by the unconditioned stimulus of excessive alcohol consumption. **A** is incorrect. An antecedent would only apply to voluntary behaviour; the light-headedness in this scenario is an involuntary response. **B** and **C** are incorrect. There is no neutral or conditioned stimulus in this scenario.

Question 16 A

A is correct. Steph is using reconstruction; she attempts to retrieve the order of the cards in the serial order in which they were presented in the deck. **B** and **C** are incorrect. Steph does not have cues and uses a serial form of recall (not free recall). **D** is incorrect. Steph is not given alternative cards to select from during the retrieval process, which eliminates recognition as an option.

Question 17 D

D is correct. Steph was vicariously reinforced as she observed a model (in this case, the two 'memory champions' she studied) using the technique, then experienced reinforcement when observing the model's success, which would have increased the likelihood of her practising the technique. **A** and **B** are incorrect. Attention and retention to the model's observed behaviour would have helped Steph learn the technique. **C** is incorrect. Reproduction refers to the capability of learning a technique.

Question 18 A

A is correct. To enhance her memory of the order of playing cards, Steph uses elaborative rehearsal to associate playing cards with locations in her house, which are already stored in her long-term memory. **B** is incorrect. Maintenance rehearsal is used to extend the duration of short-term memory, which would not help Steph given the limited capacity of short-term memory. **C** and **D** are incorrect. Steph would not have access to cues to assist her in visualising the cards when she associates the cards with locations, and context-dependent cues cannot be used during the visualisation process.

Question 19 B

B is correct. Steph's short-term memory would be actively associating the cards with locations in her house. **A** and **C** are incorrect. Sensory memory (of which iconic memory is a type) and long-term memory are more passive stores in terms of the conscious awareness of a memory. **D** is incorrect. A flashbulb memory is a vivid recall of a highly emotive memory and is not applicable in this scenario.

Question 20 B

B is correct. Steph's memory of the familiar locations in her house are stored in her cerebral cortex. **A** is incorrect. The hippocampus plays a role in the consolidation and retrieval of a memory. **C** is incorrect. The cerebellum plays a key role in the formation of a procedural memory. **D** is incorrect. The amygdala is responsible for mediating the emotionality or fear intensity of a memory.

Question 21 D

D is correct and **B** is incorrect. Prior to consenting to Albert's participation in the experiment, the researchers would have needed to inform Albert's mother of her right to withdraw Albert if he showed any signs of distress during the experiment. **A** and **C** are incorrect. Given Albert's age, he would have been incapable of understanding his withdrawal rights.

Question 22 D

D is correct. An eye-witness's court testimony could be considered unreliable because, according to Loftus, misinformation from a leading question could create source confusion during the reconstruction of the eye-witness's testimony in short-term memory. In this scenario, an example of a leading question could be 'What happened after the patient pushed the paramedic?' **A**, **B** and **C** are incorrect. While these options are potential factors that could alter a memory, they were not the focus of Loftus's research into the effects of a leading question on eye-witness testimonies.

Question 23 B

B is correct. A cognitive distortion can be reflected by difficulty retrieving the memory of the details of the incident due to the effects of the illicit stimulant. **A** is incorrect. A loss of self-control is a behavioural action, such as uncoordinated movements. **C** is incorrect. A perceptual distortion is a sensory experience, such as an inaccurate interpretation of visual stimuli. **D** is incorrect. Content limitations refers to thought processes, which are not applicable in this scenario.

Question 24 D

D is correct. The paramedic's memory of the incident was triggered by the subsequent exposure to the hotel, which triggered a vivid 'flashbulb' recall of the memory. **A** is incorrect. Semantic memories are memories of facts, which are not applicable in this scenario. **B** and **C** are incorrect. Given that recall is a conscious process, this eliminates a conditioned emotional response or implicit memory, which occur unconsciously.

Question 25 A

A is correct. The paramedic's vivid recall of the incident was triggered by the context-dependent cue of the hotel, which was the environment in which the memory was formed. **B** is incorrect. A state-dependent cue refers to the psychological traumatised state during encoding; this is not present during the retrieval process. **C** and **D** are incorrect. When the paramedic returned to the hotel, there was no leading question nor unconditioned stimulus.

Question 26 B

B is correct. An electromyograph (EMG) detects, amplifies and records the electrical activity of muscles (such as chin muscles). **A**, **C** and **D** are incorrect. An electroencephalograph (EEG) measures the electrical activity of the brain via electrodes attached to the scalp, eyes and nose. These parts of the body are not suitable for measuring muscle movements.

Question 27 C

C is correct. Humans have poor night vision, so sleeping at night reduces movement and the risk of harm from predators. **A**, **B** and **D** are incorrect. These options relate to the restoration theory of sleep.

Question 28 A

A is correct. Studies found the most significant variation in mood; sleep deprivation tends to increase irritability, whereas alcohol can reduce stress and enhance social confidence, and thus be beneficial to mood. **B**, **C** and **D** are incorrect. Evidence suggests that these indicators would show a similar level of impairment.

Question 29 A

A is correct. Newborn infants experience the highest proportion of rapid eye movement (REM) sleep due to their feeding requirements. They do not follow a circadian sleep-wake cycle, as they have multiple sleep episodes over a 24-hour period that can start with REM sleep. **B**, **C** and **D** are incorrect. These groups commence sleep with non-rapid eye movement (NREM) sleep and experience REM at the end of each sleep cycle.

Question 30 C

C is correct. The use of interviews is a form of self-reporting. **A** and **D** are incorrect. There is no independent variable in this scenario, which is required for an experiment or independent-groups design. **B** is incorrect. Observational study involves the observation of participants in a naturalistic setting.

Question 31 B

B is correct. The interviews will generate subjectively reported data from the personalised responses to the interview questions. The data is primary data as it will be generated by the researchers, not a third party as is the case with secondary data.

Question 32 A

A is correct. Sleepwalking is a type of parasomnia that disrupts slow-wave sleep and thus is less likely to impact a sleeper's ability to fall asleep compared to the other phenomena. **B**, **C** and **D** are incorrect. Delayed sleep-phase onset, sleep onset insomnia and jet lag are all characterised by difficulty falling asleep at a desired time.

Question 33 D

D is correct. An elderly person will tend to experience one or possibly no periods of NREM Stage 4, as aging progressively decreases the incidence of slow-wave sleep. **A**, **B** and **C** are incorrect. An elderly person will normally experience 17–18 hours of normal waking consciousness per day and roughly four cycles of REM and NREM Stage 2 sleep over the course of a night's sleep.

Question 34 D

D is correct, and **B** and **C** are incorrect. In terms of Lazarus and Folkman's Transactional Model of Stress and Coping, Florencia is most likely to adopt an approach coping strategy after she has evaluated her coping resources during her secondary appraisal, which has occurred following the evaluation of the significance of her stressor during the primary appraisal. **A** is incorrect. The resistance stage relates to Selye's General Adaptation Syndrome model.

Question 35 A

A is correct and **B** is incorrect. The news of Florencia's gout diagnosis would be classified as a source of distress as it is a significant stressor that would trigger a negative psychological response (not a positive response as is the case with eustress). **C** is incorrect. Acculturative stress is caused by difficulty adapting to a new host culture. **D** is incorrect. The source of stress is significant as it causes ongoing concern that will have a major impact on Florencia's wellbeing and ability to work as a personal trainer.

Question 36 B

B is correct, and **A** and **D** are incorrect. The higher level of cortisol initially promotes the release of additional glucose from Florencia's liver to provide energy and aid in the metabolism of sugars and fats. **C** is incorrect. Florencia's immune system will become suppressed as a result of the sustained effects of cortisol in her bloodstream.

Question 37 A

A is correct. The use of cognitive behavioural therapy (CBT) strategies is a psychological protective factor that would enable Florencia to cognitively restructure her thought processes towards her diagnosis, which could enhance her resilience to the stressor. **B** is incorrect. Information support is a social protective factor. **C** is incorrect. Exercise is a biological protective factor. **D** is incorrect. Psychoeducation is a social form of intervention.

Question 38 C

C is correct. Florencia could have a poor response to the supplement as a result of her genetics, as her brain chemistry may be resistant to certain forms of medication. This is a biological impairment that could reduce the effectiveness of the supplement. **A**, **B** and **D** are incorrect. These options are all psychological factors.

Question 39 B

B is correct. Replication of experimental procedures is most likely conducted to determine the consistency of data from the sample groups tested. This determines the reliability of the data. **A** and **D** are incorrect. Replication of experimental procedures does not affect the spread of data or the accuracy of statistics; these are affected by the method used to measure results. **C** is incorrect. The beneficence test is an ethical consideration that has no relevance to the consistency of data.

Question 40 B

B is correct, and **A** and **C** are incorrect. Clumsiness is a behavioural symptom as opposed to an emotional (affective) symptom or an impaired mental process (cognitive symptom). **D** is incorrect. Restorative is a distractor and not a classification of symptoms.

Question 41 A

A is correct. Toby's reluctance to seek help is due to stigma, which perpetuates his concern of being labelled as lacking resilience. **B** and **C** are incorrect. Rumination refers to Toby repeatedly thinking about patients under his care who died but not acting on the negative cycles, and poor self-efficacy relates to Toby's perceived inability to control his condition. These risk factors do not contribute to his reluctance to seek help. **D** is incorrect. A secondary appraisal is an evaluation of coping resources and does not contribute to Toby's reluctance to seek help.

Question 42 C

C is correct and **B** is incorrect. The combination of precipitating and perpetuating risk factors has contributed to Toby's cumulative risk of developing a mental disorder. He is experiencing mental health problems, not a disorder. **A** and **D** are incorrect. Protective factors contribute to a high level of resilience and high level of functioning at work.

Question 43 D

D is correct. Toby's approach to his work is evidence of a high level of functioning at a cognitive and behavioural level. **A**, **B** and **C** are incorrect. Toby's social withdrawal and dwelling on the deaths of his patients shows a lack of social and emotional wellbeing, and his difficulty adapting shows a lack of resilience.

Question 44 A

A is correct. Toby is currently experiencing the pre-contemplation stage as he is not yet ready to change his behaviour. **B**, **C** and **D** are incorrect. When Toby is ready to change, he will have reached the contemplation stage, and when he has a plan in place, he will have moved to the action stage with the maintenance stage being evidence of actioning a planned behavioural change.

Question 45 C

C is correct. When a person experiencing insomnia is educated about sleep hygiene as part of their CBT, they learn about practices that may impair their ability to go to sleep such as exposure to bright light, and avoidance of exercise and excessive food consumption. These practices – as well as daytime naps, which can disrupt the body's natural sleep-wake cycle – arouse the body.

Question 46 B

B is correct and **C** is incorrect. Finn's phobia was perpetuated through positive reinforcement as the added affection he received from his parent strengthened his phobia. There is no mention of the removal of fear (negative reinforcement). **A** and **D** are incorrect. Classical conditioning would have played a role in the precipitation of the phobia, but his phobia was directly (not indirectly) conditioned through observational learning.

Question 47 D

D is correct. Finn's belief that he will be attacked by someone wearing a costume mask is an example of catastrophic thinking as he is thinking about outcomes that are unlikely to occur. **A** is incorrect. A belief is a conscious thought process as opposed to an unconditioned response, which is a naturally reflexive response triggered by the presence of a stimulus. **B** is incorrect. Given that Finn's belief that he will be attacked is a conscious process, it is not a classically conditioned response. **C** is incorrect. There is no mention of the distorted recollection of the events that occurred during Finn's childhood (a memory bias).

Question 48 D

D is correct. CBT endeavours to identify the triggers of phobic responses and help address the cognitive bias that is the source of a phobia. **A**, **B** and **C** are incorrect. These options simply address the symptoms of a phobia.

Question 49 B

B is correct. Psychoeducation is a social form of intervention for treatment of a phobic disorder that would target Finn's family and friends to help challenge his unrealistic thoughts about masks and avoidant behaviour. **A** and **D** are incorrect. Systematic desensitisation and CBT are psychological forms of intervention. **C** is incorrect. Exercise is a biological form of intervention.

Question 50 C

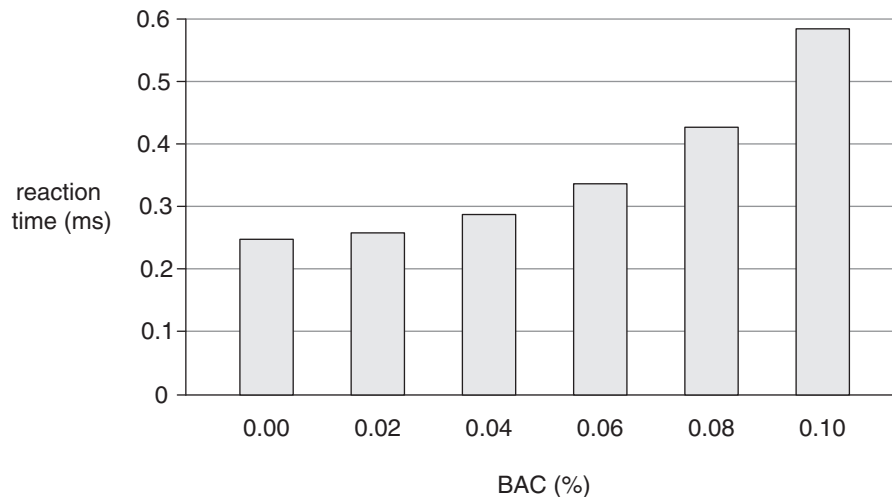
C is correct. Benzodiazepines would act as a depressant that would increase the amplitude of Finn's brain wave activity as they would slow down his central nervous system and thus his brain wave activity.

SECTION B

Question 1 (9 marks)

a.

Reaction time at varying blood alcohol concentrations (BAC)



2 marks

*1 mark for a suitably labelled y-axis.**1 mark for a suitably labelled x-axis.*

- b. Strength:** An experiment enables researchers to more easily establish a causal relationship between the effects of increasing BAC and slower reaction time by testing volunteers under controlled conditions.

1 mark

It is more difficult to establish a causal relationship with case studies as there is no control over the circumstances of the data reported in a case study.

1 mark

Limitation: There is a degree of artificiality in an experiment; driving in a simulation is not the same as driving on the road.

1 mark

There is no artificiality in case studies; they would provide in-depth studies about individuals or groups of people involved in accidents. Case studies can provide detailed information regarding the effects of alcohol on reaction time.

1 mark

- c.** Alcohol acts as a depressant on the central nervous system.

1 mark

The alcohol would have slowed the participants' neural transmission of sensory messages (in this case, a traffic light changing to yellow).

1 mark

Additionally, the participants' central nervous systems would have been slower in processing the sensory message and triggering a motor response for their foot to press the brake.

1 mark

Question 2 (12 marks)**a.** Any two of:

- In the shock substage, the flood victims would have had a reduced level of resistance to the stressor (that is, the effects of the floods). In the counter-shock substage, the victims would have had an increased level of resistance to the stressor.
- In the shock substage, the flood victims' parasympathetic nervous systems would have been the dominant division of the autonomic nervous system. In the counter-shock substage, the victims' sympathetic nervous systems would have been the dominant division.
- In the shock substage, the flood victims would have had lowered blood pressure. In the counter-shock substage, the victims would have had heightened blood pressure.

4 marks

Award 1 mark for accurately outlining one physiological response for either the shock or counter-shock substages.

*Award 2 marks for **either** accurately outlining one difference in physiological response for the shock and counter-shock substages **or** for accurately outlining one physiological response for the shock substage and one physiological response for the counter-shock stage (unrelated to the response outlined for the shock substage).*

*Award 3 marks for accurately outlining one difference in physiological response for the shock and counter-shock substages **and** for accurately outlining one other physiological response for either the shock or counter-shock substages.*

Award 4 marks for accurately outlining two differences in physiological response for the shock and counter-shock substages.

- b.** A primary appraisal is the initial evaluation of the significance of a stressor, which can vary from person to person based on subjective interpretation of the stressor.

1 mark

A primary appraisal of a challenge is more significant than a primary appraisal of a benign-positive (in the case of the flood victims, they may have evaluated the news of the relief package to be 'significant') and will consequently produce a longer-term response (in the case of the flood victims, in terms of the energy and resources required to manage the funds to rebuild their houses).

1 mark

A primary appraisal of a benign-positive indicates a response that is desirable (for the flood victims, in terms of the access to the relief package funds) but is far less significant than a primary appraisal of a challenge and thus only produces a short-term/mild response.

1 mark

- c.** The flood was a major stressor or catastrophe.

1 mark

This is because the flood was an event that affected an entire community.

1 mark

- d.** Ruminating is the tendency to repeatedly think about situations that are upsetting without acting to change them.

1 mark

Over time, this can increase the susceptibility for the development of (precipitate) a mental health problem.

1 mark

This would be reflected by a temporary and moderate level of impairment in a flood victim's daily function, which is indicative of a mental health problem.

1 mark

Question 3 (7 marks)

- a. As a result of repeated practice of the basketball shooting technique demonstrated by her coach rather than the previously learned netball shooting technique, the neural connections responsible for Edna's netball shooting technique would have weakened as a result of long-term depression. 1 mark
- This would have enabled a strengthening of basketball shooting technique due to long-term potentiation. 1 mark
- Due to the repeated high-frequency input from presynaptic neurons to postsynaptic neurons, the repeated practice would have enabled the motor areas of Edna's brain to adjust her grip, shooting mechanics and follow-through. 1 mark
- b. **Attention:** When observing her coach's demonstrations, Edna would have actively observed and noted the distinctive features of her coach's grip, shooting mechanics and follow-through. 1 mark
- Retention:** Edna would have made a mental representation of the various physical movements (motor skills) required. 1 mark
- Then, when practicing her basketball shooting at a later time, she would consciously use these motor skills until they became a procedural memory, which would have enabled Edna to retrieve these motor skills without conscious effort. 1 mark

Question 4 (9 marks)

- a. Circadian rhythm is disrupted as a result of the time difference between locations. 1 mark
- An individual may find it difficult to fall asleep when they arrive in a new time zone as their circadian rhythm is out of sync with the desirable sleep-wake cycle for the new time zone. 1 mark
- b. When they are in Melbourne, the workers could wake up early in the morning and expose themselves to natural light or a safe level of high intensity artificial light. 1 mark
- This would suppress the workers' melatonin levels and trigger an earlier release of melatonin in the evening to help synchronise their sleep-wake cycles to Melbourne time. 1 mark
- c. The workers are experiencing anxiety. 1 mark
- They are experiencing a state of arousal involving a level of apprehension; that is, nervousness about a future event (in this case, difficulty falling asleep). 1 mark
- They are not experiencing stress, which is a state of physiological or psychological arousal that exceeds an individual's ability to cope, which is not evident in this case. 1 mark
- d. *Any two of:*
- moodiness
 - irritability
 - amplified emotional response
 - flat mood
 - lowered empathy
- 2 marks

Question 5 (9 marks)

- a.** Adrenaline would have played a key role in Sheila's fear conditioning process, and thus the formation of the implicit memory of the conditioned emotional response, by creating an unconscious association between the brick fence and fear. 1 mark
- Glutamate would have played a key role in consolidating the explicit memory of the traumatic event. 1 mark
- Thus, glutamate would have enabled Sheila to encode the contextual details of the event, such as when it occurred, the location in the backyard where the fence collapsed on her and the nature of her injuries. 1 mark
- b.** Only the conditioned stimulus, large brick fences in this case, would elicit the conditioned response of fear in Sheila. 1 mark
- Other stimuli similar to the conditioned stimulus, such as plastered or wooden fences, would not elicit a fear response in Sheila. 1 mark
- c.** Any one of:
- a lack of gamma-amino butyric acid (GABA) (GABA dysfunction)
 - genetics
- Sample response (a lack of GABA):*
- A lack of GABA 1 mark
- could have increased Sheila's susceptibility for developing a phobic disorder. If her brain is unable to produce adequate amounts of GABA to counteract her arousal, she would experience an excessive stress response when faced with a large brick fence. 1 mark

Question 6 (14 marks)

- a.** It is hypothesised that when working a night shift, security guards will experience a brief increased level of cognition after consuming coffee containing 100 mg of caffeine, as reflected by EEG readings showing increased brain wave frequency after the consumption of the coffee compared to brain wave frequency prior to the consumption of the coffee. 3 marks
- 1 mark for the population (security guards).*
- 1 mark for a prediction (the effects of caffeine will increase cognition/brain wave frequency).*
- 1 mark for the independent variable and dependent variable (pre- versus post-caffeine consumption/level of cognition as reflected by EEG readings).*
- b.** When a security guard is in a relaxed state, the EEG might detect, amplify and record brain waves that are of relatively lower frequency/higher amplitude, indicating that the security guard is experiencing a normal waking consciousness rather than a caffeinated state. 1 mark
- The EEG might show higher frequency/lower amplitude brain waves when the guard is in a caffeinated state. 1 mark
- This would indicate that the guard is experiencing an altered state of consciousness due to the caffeine acting as a stimulant on central nervous system activity. 1 mark

- c. For a security guard who recently started working night shifts, the effects of night shifts may be more disruptive to their circadian rhythm because they would find it difficult to adjust their sleep-wake cycle over a 24-hour period. 1 mark

This would result from exposure to zeitgebers. For example, daylight may make it difficult for them to sleep during the day and cause them to remain awake at night. 1 mark

Ultradian rhythms are recurrent biological processes that only last 90–100 minutes each, thus once the security falls asleep they will potentially experience multiple cycles with normal REM/NREM patterns. 1 mark

- d. *Any one of:*

- Quantitative data can be obtained from the EEG readings (for example, the frequency of the guards' brain waves). The data would be easily summarised, analysed and compared (in comparison to qualitative data). The data would fail to provide rich details of the effects of caffeine on the brain that could be evidenced through qualitative data; for example, whether the security guards felt more perceptually alert to sights and sounds after consuming coffee.
- Primary data can be obtained from the EEG readings. When gathering primary data, researchers can control the method of sampling (for example, the number of security guards tested), the manner in which the sample is selected and the manner in which data is measured. Primary data is more time-consuming and costly to gather (for example, recruiting security guards as participants, designing a research investigation, gathering and analysing the data) compared to secondary data, which can be sourced from a third party (for example, via the internet).

3 marks

1 mark for identifying the type of data.

1 mark for providing an advantage.

1 mark for providing a limitation.

Question 7 (10 marks)

The study's participants and, if a participant is aged 17 or under, their legal guardians will need to sign a consent form that outlines the nature of the study (for example, an explanation of the requirement for participants to cease taking any existing medication). The consent form will also need to explain the rights of the participants (for example, their ability to exercise their withdrawal rights, the right to have their confidentiality maintained) and the risks in terms of the potential impact of the study on their wellbeing, particularly for participants who do have to cease taking existing medication. The consent form will need to outline the purpose of the placebo drugs, and explain that both before and during the study the participants will be unaware of whether they are taking a placebo or clonazepam. The form must also explain that participants will be debriefed at the end of the study where the form of the medication that they took for each phase of the experiment (if a repeated measures design is chosen) will be revealed. If a participant (and their guardian if required) understands all the information provided in the consent form, then they can consent to participate, free from any coercion (voluntary participation). At the end of the study, the participant (and their guardian if required) must be informed about the use of the placebo (if relevant), the results of the study and how the results will be used.

In order to generate valid data, it is advisable that the researchers conduct an experiment that employs a repeated measures design, which would eliminate any potential participant-related variables, such as the severity of each participant's social phobia and whether participants have medication or other forms of treatment for the phobia. The design should be counterbalanced to prevent an order effect confounding the results. For example, the experiment could run for 12 weeks, during which one half of the participants could be given clonazepam for the first six weeks and the other half of participants could be given the placebo; then, in the remaining six weeks of the study, the participants who were given clonazepam could be given the placebo and the participants who were given the placebo could be given clonazepam.

Due to the nature of the population, a convenience sample would be the most practical method of recruiting participants. For example, mental health clinics located in Melbourne that specialise in the treatment of social anxiety or phobias could be contacted and patients could be asked if they would be interested in participating in the study. Due to the potential to generate an unrepresentative sample, it would be advisable to recruit a large sample (for example, 100 participants). A random sample would be the preferable method for recruiting participants, but for largely ethical reasons it would be impractical to access a database of patients who have been diagnosed with a social phobia and to contact them about participating in the study without any form of prior communication.

Standardised instructions and procedures would enhance the validity of the data. The researchers could use a pre-recorded message that outlines the format of the study and the participants should be given clear guidelines regarding not accessing other forms of treatment, a set daily time for consuming the medication, and so on.

In order to generate descriptive statistics, a rating scale that uses clear language could be employed for participants to periodically evaluate the severity of the symptoms of their social phobia. This would generate quantitative data from which mean scores could be calculated and then compared (placebo versus clonazepam conditions). A standard deviation of both scores could be obtained from quantitative data, which would develop a sense of the consistency of the data. It would be preferable to use a more objective measure, but this would require the use of a third party, which may be difficult to implement (for example, having access to a mental health clinician who specialises in social phobias in order to complete a periodical rating of the severity of the social phobia).

Marking guide*Very high (9–10 marks)*

The student has:

- provided a detailed description of both the ethical requirements and research methodology in relation to the scenario
- demonstrated higher-order thinking skills in their approach (such as including a detailed description of how the research design would be implemented, the recruitment of the participants, informed consent procedures and the use of statistical measures)
- effectively addressed relevant methodology that features in the research methods component of VCE Psychology.

High (7–8 marks)

The student has:

- provided a description of both the ethical requirements and research methodology in relation to the scenario
- effectively addressed relevant methodology that features in the research methods component of VCE Psychology.

Medium (5–6 marks)

The student has:

- provided a description of both the ethical requirements and research methodology in relation to the scenario
- provided a response that is somewhat generic; that is, the response does not clearly relate to the medication versus placebo study.

Low (3–4 marks)

The student has:

- provided a limited description of both the ethical requirements and research methodology in relation to the scenario
- provided a response that is largely generic; that is, the response does not clearly relate to the medication versus placebo study
- failed to address the majority of the criteria of the question such as the ethical requirements, use of placebos, methodology etc.

Very low (0–2 marks)

The student has:

- provided a limited description of either the ethical requirements or research methodology that is largely unrelated to the scenario
- failed to address all the criteria of the question such as the ethical requirements, use of placebos, methodology etc.