

Trial Examination 2017

VCE Psychology Units 3&4

Written Examination

Suggested Solutions

SECTION A – MULTIPLE-CHOICE QUESTIONS

1	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
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50	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D

Question 1 A

Depressants such as alcohol slow down (depress) the activity of the nervous system and reduce the level of awareness. Vinnie's brain wave activity would decrease in frequency and increase in amplitude.

Question 2 C

Giorgia is experiencing a positive psychological response to a stressor, which will increase her level of arousal and thus trigger a fight-flight-freeze response to the stressor.

Question 3 B

Guy's assault is an example of a precipitating factor that has increased his susceptibility to developing a stress-related disorder. Perpetuating factors inhibit recovery, for example drug abuse; predisposing factors are pre-existing conditions such as genetic influences that increase susceptibility; and protective factors such as a good diet and sleep prevent the occurrence of a stress-related disorder.

Question 4 B

Episodic memories are types of declarative memory that need to be consciously recalled. The brain is only capable of storing abstract details of these autobiographical events; therefore they need to be reconstructed during recall by retrieving the abstract details and incorporating other details from memory in order to conventionalise the story.

Implicit and procedural memories are not consciously recalled and short-term memories cannot be recalled after 30 seconds unless they are being actively rehearsed – they are simply 'maintained' in short-term memories.

Question 5 B

The burns to Emma's body were an unconditioned stimulus, which triggered the unconditioned response of the pain and trauma. The neutral and conditioned stimuli are the exposure to fire (before and after the incident respectively).

Question 6 A

As a result of a traumatic environmental experience, Emma's phobia has been classically conditioned. In this case, the event has acted as a precipitating factor in the acquisition of Emma's phobia of fire. Predisposing factors are typically inherited, perpetuating factors inhibit recovery and protective factors prevent the reoccurrence.

Question 7 D

Adrenaline is a neurohormone which is a chemical message released by neurons into the bloodstream. Adrenaline enhances the consolidation of an emotionally arousing experiences such as Emma's trauma experienced as a result of her car crash. High levels of adrenaline released as a result of her stress response will contribute to making her memory of the crash more vivid and durable.

Question 8 B

CBT is an effective form of treatment for treating insomnia by identifying the causes of insomnia, then changing the beliefs and attitudes about sleep and then making behavioural changes in order to achieve a better level of sleep hygiene.

Question 9 A

Claire's somatic nervous system would have initially detected the sensory information in the form of the tactile feeling of the prickly weed. Afferent signals would have then been sent to the central nervous system (the brain from the spinal cord). The autonomic nervous system is responsible for regulating the body's internal environment (vital organs).

Question 10 C

A disorganised attachment is a result of unresolved childhood conflict with the child's primary caregiver, in which the child was unable to form a healthy attachment with their parent(s). This is manifested in difficulty forming meaningful and trusting relationships later in life, and thus is a social risk factor that can contribute to a mental health problem such as anxiety or depression.

Question 11 A

The GAS can best be described as a biological model that emphasises the relationship between the body's response to stress over a three-phase model.

Question 12 B

Seyle's research was carried out on rats by exposing them to a series of stressors such as variations in temperature in order to determine the relationship between stress and illness.

Question 13 C

The resistance stage of the GAS has been described as an 'adaptive stage' in which the parasympathetic nervous system starts to reduce the heart rate and physiological processes, whilst stress hormones continue to circulate in the bloodstream in order to continue to resist the stressor.

Question 14 C

The advantage referred to is that class B is tested in the same room in which they learned the information. This allows class B to utilise context-dependent cues, as the environment where they learned the information may aid their recall of it. Class A, who are tested in the library and not in the room where they learned the information, does not have access to these context-dependent cues.

Question 15 A

Sleep-onset insomnia is a type of dyssomnia, which are a group of sleep disorders that make it difficult to go to sleep or remain asleep.

Question 16 D

The period of time just prior to a sprint race is the antecedent; Emily's behaviour was to complete the stretching and warm-up exercises to avoid the consequence of the injury.

Question 17 C

Emily's injury from her first race is an example of positive punishment, as an undesirable stimulus has been added (her injury) that is likely to weaken the behaviour of racing without stretching in the future.

Question 18 B

Following her injury, Emily has learned the value of stretching and warming up prior to racing as a result of negative reinforcement, as her stretching behaviour is being strengthened in order to reduce the risk of an aversive stimulus, in this case another injury.

Question 19 C

A phobia is a relatively persistent, intense and irrational fear of an object or situation. Anxiety on the other hand refers to a persistent feeling of unease.

Question 20 B

Stressors such as work or school pressures are examples of external factors that can influence mental health. Personality, a person's immune system and genetics are all internal factors.

Question 21 C

In terms of psychological characteristics of consciousness, content tends to be most limited during normal waking consciousness when we typically restrict our thoughts to the task at hand. During daydreams, sleep, and an alcohol-induced state, the content of our thoughts becomes less limited as we may have bizarre thoughts or fantasies.

Question 22 D

On average a sleeper experiences one REM/NREM sleep cycle every 90 minutes. This is an example of a ultradian rhythm, which refers to bodily cycle that are repeated more than once during a 24-hour period, as opposed to a circadian rhythm such as the sleep-wake cycle, which occurs once every 24 hours.

Question 23 C

Dan is experiencing the pre-contemplation stage during his initial reluctance to accept that he has a mental health problem and that he needs to change his behaviour.

Question 24 B

Dan is experiencing the contemplation stage when he has acknowledged that he has a mental health problem and he needs to change his behaviour. He will reach the preparation stage when he starts making plans and taking steps to change his behaviour and the maintenance stage when he has largely modified and controlled his behaviour for six months.

Question 25 A

Moodiness is an affective (emotional) symptom of sleep deprivation, impaired concentration is a cognitive symptom, impaired coordination, and difficulty performing monotonous tasks are behavioural symptoms.

Question 26 C

The dendrites contain the receptors for the uptake of the neurotransmitters, the axon terminal stores the neurotransmitters in sacs known as vesicles, the axon conducts electrical impulses which is enhanced by the surrounding myelin.

Question 27 B

When GABA binds with a receptor, it will have an inhibitory effect and make the postsynaptic neuron less likely to fire, thus having a calming effect on the body by counteracting the excitatory effects of glutamate. Glutamate needs to balance with GABA for an optimal level of functioning.

Question 28 C

Anterograde amnesia has the most significant effect on the ability to encode and consolidate explicit memories due to damage to the hippocampus (which plays a key role in this process). Short-term memory and implicit memory will be largely unaffected as other areas of the brain are responsible for these facets of memory. Retrieval of well-established long-term memories will be largely unaffected.

Question 29 C

Relearning is the most sensitive method of retrieval, as the use of the savings score formula means that it can register the presence of only a small memory trace more effectively than can the other three forms of retrieval.

Question 30 B

During the primary appraisal, Smilla will evaluate whether her pending unemployment from university is significant, insignificant, or benign positive. During her secondary appraisal she will evaluate if she has the resources to cope; for example, who she can turn to for support. Using a coping option will help her reduce her stress levels in the short term.

Question 31 B

A primary and secondary appraisal can be made concurrently, but during her primary appraisal she will evaluate the harm, threats and challenges of being unemployed from university.

Question 32 A

Little Albert's conditioned emotional response was his fearful startled response which was elicited in the presence of the conditioned stimulus – the presentation of the white rat. This was a result of multiple pairings of the white rat (originally the neutral stimulus) with the loud bang (unconditioned stimulus) which originally triggered the unconditioned response of the fearful startled reaction until the association had been made.

Question 33 A

When Vivien was experiencing REM sleep, the EMG would detect, amplify and report a lower level of muscle activity due to the effects of REM paralysis in comparison to when she was experiencing NREM sleep. The EEG would detect a higher level of brain activity (whilst dreaming) and the EOG would detect rapid eye movements through the high levels of electrical activity that control eye movements.

Question 34 A

One of the predisposing factors for the development of a phobic disorder is a dysfunctional GABA system. Benzodiazepines treat the lack of this neurotransmitter by mimicking the effects of GABA at the postsynaptic neuron, thus providing a calming effect on the body and reducing the anxiety in the presence of the phobic stimulus.

Question 35 A

Psychoeducation is a social form of intervention for treating a specific phobia that educates both the sufferer and family about the victim's phobic condition and the forms of treatment that they can assist with and support. CBT and systematic desensitisation are social forms of intervention and breathing retraining is a biological form of treatment.

Question 36 D

The placebos would be issued to the control group or control condition in the case of a repeated-measures research design to provide a baseline comparison to the effects of the medication on the experimental group.

Question 37 B

Jet lag is most likely to cause a disruption to the body's circadian rhythm as a result of travelling to a different time zone. This can affect the body clock as the traveller might find it difficult to adjust their sleep-wake cycle to the new time zone.

Question 38 A

Long-term depression occurs as a result of the reduced activation of a neural pathway, which weakens the strength of the signal that is delivered from the presynaptic neuron to the postsynaptic neuron. Theoretically this provides a means of the brain clearing old memories to make room for new memories. Long-term potentiation and synaptogenesis describe the biological processes involved in memory formation.

Question 39 D

An experiment tests the effect of the manipulation of an IV on the DV. There are other form of data collection, such as a case study which is an in depth study of an individual or group where there is no IV or DV.

Question 40 C

The use of the university students is an example of a convenience study, as Professor Priddle is accessing readily available university students to represent the population of young adults. Not every member of the population of young adults has an equal chance of being selected to participate in the experiment which means that it is not a random sample. There has been no attempt to stratify the population which eliminates options **B** and **D**.

Question 41 D

Maintaining an adequate diet is a protective factor for maintaining mental health, which prevents the onset or reoccurrence of a mental illness and thus helps maintain mental health. The other three options all relate to increasing the susceptibility to or inhibiting recovery from a mental condition.

Question 42 C

The major purpose of an ethics committee for psychological research is to ensure that the welfare and the rights of participants are maintained.

Question 43 B

Regular exercise uses up stress hormones such as cortisol which will help reduce the level of stress an individual feels. Along with the release of endorphins, this will provide a greater sense of wellbeing.

Question 44 D

Elaborative rehearsal is used to improve the durability of long-term memory by linking new material to existing memories in long-term memory, which leads to a deeper level encoding and thus a more effective method of storage.

Question 45 A

Adults typically spend approximately 50% of their total time in NREM Stage 2 sleep, which is considered a light stage of sleep.

Question 46 B

According to the principles of social learning theory, learning occurs vicariously (indirectly) by a learner observing the behaviour of others and noting the consequences (as is the case with operant conditioning). Once the learning has occurred, it may remain hidden (latent) such as how children who observe aggressive driving behaviour from their parents may not exhibit this behaviour until they become of a driving age.

Question 47 D

In terms of social learning theory, reinforcement can influence the learning of an individual when it occurs vicariously, for instance from the model or a third person or coming from within (personally). Social learning relies on cognitive processes, thus it is not a reflexive process which relates to classical conditioning.

Question 48 C

Sleep walking episodes are most likely to occur during slow-wave sleep when there is a lack of brain activity during Stages 3 and 4 of NREM sleep.

Question 49 B

Genetics can be a predisposing factor to the development of a mental illness, but other biological, psychological and social factors can also contribute to the development and progression of mental illness.

Question 50 B

The autonomic nervous system is responsible for controlling unconscious functioning, such as regulating pupil size dependent on the environmental lighting conditions (which does not require a conscious response).

SECTION B**Question 1** (6 marks)

a. *Any two of:*

- Ruth would demonstrate a high level of functioning as she is maximising her academic potential.
- Ruth would demonstrate emotional or social wellbeing through her interactions with family, friends and school peers.
- Ruth would demonstrate typical/adaptive behaviour.
- Ruth would demonstrate the ability to cope with day-to-day stressors.

2 marks

b. Resilience is the ability to adapt to stressors.

In Ruth's case, she is able to adapt to fluctuating academic demands.

2 marks

*1 mark for an explanation of resilience.
1 mark for clearly linking response to scenario.*

c. *Any two of:*

- support from family; for example, her parents or siblings
- support from the community; for example, school and/or her peers at school
- Any other appropriate support network

2 marks

Question 2 (2 marks)

A strength of using subjective reporting is that it provides rich qualitative data.

1 mark

A limitation is that the subjectivity of the reporting may affect the accuracy and thus the validity of the data.

1 mark

Question 3 (7 marks)

a. Due to the degeneration of the dopamine producing neurons in the substantia nigra, the nearby striatum which regulates motor control lacks the necessary neural input causing a loss of control of motor functions, such as rigid muscles or tremors.

1 mark

1 mark

b. It is hypothesised that 60–85 year old patients who have been diagnosed with Parkinson's disease will show a slowed decline in their motor functionality when consuming a daily dose of the Lgaba drug than in comparison to when they were consuming a daily placebo.

3 marks

1 mark for IV (Lgaba versus placebo).

1 mark for DV (rate of decline of motor functioning).

1 mark for population (60–85 year old patients diagnosed with Parkinson's disease).

c. Operationalised IV: Whether the patients consumed a daily dose of Lgaba or placebos for a six-month period.

1 mark

Operationalised DV: The score out of 100 on a series of motor tests designed to test the severity of their motor symptoms developed from Parkinson's disease.

1 mark

Question 4 (2 marks)

The release of neurotransmitters such as glutamate from the presynaptic neuron can have an excitatory effect. 1 mark

This will make the postsynaptic neuron more likely to fire. 1 mark

Question 5 (4 marks)

a. The eyewitness will not be able to store the memory in its raw form, thus the memory of the hit-and-run accident will need to be reconstructed. 1 mark

This will be achieved by retrieving abstract features of the incident and adding in other details in order to conventionalise the eyewitness testimony. 1 mark

b. A leading question is a question that influences eyewitnesses by implying or suggesting an answer. 1 mark

Thus, if the eyewitness was asked a question such as “What happened after the speeding car hit the pedestrian?”, this may influence the eyewitness’s reconstruction of the memory (as it is implying that the car was speeding when it hit the pedestrian). 1 mark

Question 6 (5 marks)

a. Stimulus discrimination occurs when a conditioned response (CR) is elicited by a similar stimulus to the conditioned stimulus (CS). 1 mark

In this case the dog may salivate (CR) to a stimulus that is similar to the sound of a bell (CS), for example the sound of a phone ringing. 1 mark

Note: Other suitable examples are acceptable.

b. Extinction would occur by repeatedly presenting the CS without the unconditioned stimulus (UCS) until the CR no longer occurs. 1 mark

In this case repeatedly ringing the bell (CS) without the meat (UCS) until the dog no longer salivates (CR) to the sound of the bell. 1 mark

Question 7 (4 marks)

The somatic nervous system is responsible for voluntary responses through detection of sensory stimuli from the environment; for example, tactile information such as the heat felt on the skin from a shower, along with the activation of the skeletal muscles which enables the individual to respond to the sensory stimuli.

The autonomic nervous system is responsible for involuntary responses to sensory stimuli through changes to the visceral muscles which regulate the activity of vital organs such as the heart; for example, an increase in sweat gland activity in response to moving to a warm environment.

4 marks

1 mark each for identifying each division of the peripheral nervous system.

1 mark each for a suitable explanation for each division which emphasises the voluntary and involuntary response respectively.

Question 8 (4 marks)

- a. Alcohol is a depressant that slows down the activity of the central nervous system. 1 mark
Vin would experience a reduced level of awareness (meaning alpha brain waves) during his work shift as a result. 1 mark
- b. Similarity: Both Val and Vin would experience a lowered level of concentration or impaired cognition in terms of memory processes and diminished performance on complex tasks at work. 1 mark
Difference: Vin may experience an increase in confidence and elevated mood, whereas Val may be more irritable, flat and experience a reduction in confidence. 1 mark

Question 9 (2 marks)

Rumination is a psychological risk factor for mental health.

- It refers to the tendency to repeatedly think about situations that are upsetting, 1 mark
thus the ruminator focuses on the causes and consequences of their negative emotional state rather than the solutions. 1 mark

Question 10 (7 marks)

- a. When Rishi was attacked by the dog, Rishi's fight-flight-freeze response was activated. 1 mark
This triggered the sympathetic nervous system to release stress hormones into the body through the adrenal gland and thus trigger a rapid increase in bodily arousal such as an increase in heart rate in order to deal with the threat. 1 mark
- b. Rishi's amygdala would have been responsible for his conditioned fear, 1 mark
and by repeated activation of these fear pathways in his brain which triggers the activation of the fight-flight-freeze response when exposed to his phobic stimulus of the dog, the hippocampus would have consolidated his fear response in the presence of a large dog. 1 mark
- c. CBT involves a combination of cognitive and behavioural therapy.
Cognitive therapy: Rishi would need to undertake a cognitive appraisal to help him focus on determining the cause of his phobia of dogs by documenting the occurrence of his negative thoughts in a diary. 1 mark
Then he could challenge these anxious thoughts and recognise his cognitive bias which would help him reappraise the level of threats and have more realistic thoughts. 1 mark
Behavioural therapy: This involves managing his fear response in the presence of large dogs which will reduce his avoidance and anxious behaviour. 1 mark

Question 11 (2 marks)

- Approach strategies focus on the cause of the stressor; in this case, dealing with the pressures of being a single parent. 1 mark
Then the approach strategies aim to find a solution that will help reduce the emotional distress, such as seeking assistance from parents and friends. 1 mark

Question 12 (2 marks)

- a. The hippocampus plays a key role in the encoding and consolidation of explicit memories which are consequently stored in other parts of the brain, such as the cerebral cortex. 1 mark
- b. The cerebellum is involved in implicit memory, specifically procedural memory as it plays a key role in motor learning, for example our ability to learn a sequence of movements. 1 mark

Question 13 (3 marks)

- a. Sleep increases the animal's chances for survival as species' sleep patterns have evolved around the periods of light and darkness to meet the demands of their environment-based elements such as food required, the need for energy consumption and to hide from predators when inactive. 1 mark
- b. Small and vulnerable animals tend to sleep longer than larger animals as they can hide from their predators when they sleep. For example, possums sleep up to twenty hours and are relatively safe in their tree nests during this period from predators such as foxes, but larger animals that need larger quantities of food tend to sleep less, such as cows sleeping for four hours. 1 mark
- c. During sleep, the loss of awareness makes the animal highly vulnerable to any form of attack by predators. 1 mark

Question 14 (4 marks)

If Josh consciously responds to the heat of the cup, then his somatic nervous system will detect and convey the sensory information (in terms of the heat of the cup) towards the central nervous system.

Afferent signals will be conveyed to the brain via the spinal cord (central nervous system), where he will be aware of the heat of the cup and thus trigger a conscious response.

His somatic nervous system will also detect and convey the sensory information to the spinal cord.

The interneurons in his spinal cord will integrate sensory and motor signals and trigger an unconscious spinal reflex, resulting in a rapid removal of the hand from the hot cup that Josh is unaware of whilst the movement is occurring.

4 marks

1 mark for an explanation of the role of the somatic nervous in the conscious response.

1 mark for an explanation of the role of the somatic nervous in the spinal reflex.

1 mark for an explanation of the role of the brain in initiating the motor response (central nervous system) in the conscious response.

1 mark for an explanation of the role of the spinal cord triggering the motor response (central nervous system) in the unconscious response.

Question 15 (4 marks)

	Sensory memory	Short-term memory	Long-term memory
Capacity	unlimited	5 to 9 bits	unlimited
Duration	0.3 to 4 seconds	12 to 30 seconds	unlimited

Question 16 (2 marks)

Any two of:

- A newborn requires more sleep (around 16 hours) than a child (around 11 hours).
- A newborn would experience a higher proportion of REM sleep (around 50%) than a child (around 20%).
- A newborn's sleep-wake cycle tends to be more ultradian; they may only experience 1–2 sleep cycles over 3–4 hours at a time, multiple times over a 24 hour period. A child has a more circadian sleep-wake cycle; that is, a consistent and recurrent sleep-wake cycle once per 24-hour period.

2 marks

Question 17 (10 marks)**Data collection**

The use of a sleep diary was a form of subjective reporting (a self-report).

The advantage of subjective reporting in this case was that the questions could be easily tailored to suit the research and potentially generate rich data in terms of providing a measurement of the quality of sleep and attentiveness during the day.

The limitations of the use of the sleep diary include the subjectivity of the reporting, as it would be difficult for the participants to provide an overall rating of their attentiveness at the end of the day given variations from class to class. Likewise, a rating of the quality of sleep could be affected by stress levels and general health. Other physiological measures such as the use of an EEG might have provided a more useful measure in terms of a determination of the REM versus NREM quantities and proportions during each night.

A circadian phase disorder occurs when the sleep-wake cycle is disrupted, which can result in sleep disturbances and daytime fatigue. Due to a combination of changes in an adolescent's body clock and lifestyle, adolescents may experience delayed sleep-phase onset. The academic demands of school along with the early waking time required for many students along with busy social lives and night-time distractions such as social media can alter their circadian rhythm. The result of this is a potential delay in the release of hormones such as melatonin at times which induce sleep and cortisol during the day to regulate alertness. These factors can make it difficult for the adolescent to go to sleep and create difficulties waking up, thus resulting in sleep deprivation as the adolescent is not experiencing the nine to ten hours per night required at this stage of life.

Bright light therapy can be used to treat circadian phase disorders such as delayed sleep phase onset. The exposure to the high-intensity bright light early in the morning can help adjust the body clock by altering signals in the suprachiasmatic nucleus which, in turn, will affect the release of cortisol and melatonin at the necessary times. In this case, the results indicated that the use of bright light therapy has had a significant effect on the duration of sleep, quality of sleep and attentiveness during the day for the 88 participants for the duration of the experiment.

Evaluation of research design

The use of a repeated-measures design has effectively eliminated any participant-related disorders such as the severity of their circadian-phase disorders, sleep environment or other factors.

The limitation of a repeated-measures research design is the potential impact of an order effect given the data collection process was not counterbalanced, thus the order that the two stages of the experiment was completed in could have confounded the results; the participants may have had a boredom effect in the manner in which they completed the evaluation of the ratings of sleep and attentiveness. This could affect the ability of the researchers to make a valid conclusion and thus limit the extent to which the results can be generalised to the wider population.

10 marks

Marking grid*Very high (9–10 marks)*

- detailed explanation of circadian phase disorders/the use of bright light therapy
- detailed evaluation of the data collection
- detailed evaluation of the repeated-measures research design used in this experiment

High (7–8 marks)

- thorough explanation of circadian phase disorders/the use of bright light therapy
- thorough evaluation of the data collection
- thorough evaluation of the repeated-measures research design used in this experiment

Medium (5–6 marks)

- moderate level of explanation of circadian phase disorders/the use of bright light therapy
- moderate level of explanation of the data collection
- moderate level of explanation of the repeated-measures research design used in this experiment

Low (3–4 marks)

- limited/low level of explanation of circadian phase disorders/the use of bright light therapy
- limited/low level of explanation of the data collection
- limited/low level of explanation of the repeated-measures research design used in this experiment

Very low (0–2 marks)

- limited, if any, explanation of circadian phase disorders/the use of bright light therapy
- limited, if any, explanation of the data collection
- limited, if any, explanation of the repeated-measures research design used in this experiment