

Trial Examination 2018

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
2	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D
3	<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 type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> D

Question 1 A

The sensory receptors in the somatic nervous system were responsible for the initial detection of the thorn; sensory neurons would then convey a neural impulse to the central nervous system, where the message would be processed by the brain.

Question 2 D

Given it is a conscious response to sensory stimuli, the brain would have initiated the motor response by conveying an efferent message via the spinal cord to the skeletal muscles in the somatic nervous system. This would have triggered the necessary movement of the hand muscles responsible for the removal of the thorn from the forearm.

Question 3 A

Axons in the arm would have conducted the pain message via a neural impulse to the central nervous system for processing.

Question 4 D

Parkinson's disease is caused by the degeneration of dopamine-producing neurons in the substantia nigra, which play a key role in the control of movements, posture and balance.

Question 5 B

This would most likely be classified as a life event, which is a more significant and less frequently occurring form of stressor than a daily pressure.

Question 6 C

Emily's excitement is an indication that she has experienced eustress, a positive psychological response to a stressor.

Question 7 C

The sympathetic nervous system would experience a heightened level of activity in comparison to a relaxed state, but the parasympathetic nervous system would remain active. Both divisions of the autonomic nervous system are active at the same time as they counterbalance each other's activity.

Question 8 B

Short-term memory (STM) actively processes information received from the environment that has been attended to (sensory memory), or retrieved from long-term memory (LTM) for use.

Question 9 A

Alzheimer's disease is a neurodegenerative disease that typically starts in the hippocampus, as reflected by the early symptoms of explicit memory loss.

Question 10 D

Adrenaline would initially be released by the adrenal gland; this would activate the fight-flight-freeze response and enable Maeve to rapidly respond to the threat of the dog.

Question 11 A

Bowel activity would have been suppressed, as the resources involved in this would be diverted to more essential physiological systems when the body is threatened; for example, to increase heart rate and sweat gland activity, and release additional sugars and fats as an additional energy source.

Question 12 D

When in shock, Max's body would have acted as if it was injured, as reflected by a drop in body temperature due to the sympathetic nervous system being yet to respond.

Question 13 B

Max is experiencing the resistance stage, as reflected by his body's ability to adapt to the demands of the stressor by maintaining a high level of resistance to the original stressor after the initial spike in arousal experienced during the alarm stage (countershock).

Question 14 B

Sedating antihistamines are a type of depressant that reduces nervous system activity. This is reflected by the sleep-inducing side effects.

Question 15 A

A case study is an in-depth study of an individual or group and thus there is no independent variable (IV), which prevents the ability to form control versus experimental groups, as opposed to the three types of research designs identified in options **B**, **C** and **D**.

Question 16 D

The use of the placebos given to half of the participants in the university's research investigation is an example of a single-blind procedure, as the participants would be unaware as to whether they were in the control or experimental group.

Question 17 C

The university would need to use stratified sampling, by creating two stratum based on gender. They would then need to decide on their ideal sample size and ensure the gender ratio in the sample matches the gender ratio of the population, so that the sample is proportionally representative of the population of interest – in this case, adults who suffer from an allergic condition.

Question 18 A

A large part of Molaison's hippocampus was removed during the operation, which resulted in his anterograde amnesia.

Question 19 B

Molaison's inability to recall details of conversations from earlier in the day was evidence that he was suffering from anterograde amnesia due to the removal of the hippocampus, which eliminated his ability to consolidate explicit memories.

Question 20 C

Molaison's ability to master the mirror-drawing task indicated that his implicit memory was largely unaffected by the surgery, as other brain structures responsible for his conditioning of this skill were intact (for example, the cerebellum); thus he could still form these types of memories which could be recalled without conscious awareness.

Question 21 D

Self-reports that ask open-ended questions can generate written statements that are potentially rich in detail. Bar charts, standard deviation and percentages are all quantitative types of data.

Question 22 C

This is an example of learning via negative reinforcement, as Drew's behaviour of consciously opting to have the annual flu shot has been strengthened in order to reduce the aversive effects of the flu.

Question 23 C

The Year 12s had learned by observing the behaviour of the previous Year 12 cohort and noting the undesirable consequences; thus due to the effects of vicarious punishment, they modified their behaviour accordingly in order to avoid any potential punishment themselves.

Question 24 A

A classically conditioned reflex is typically stored in the cerebellum.

Question 25 D

Pau recalled the six-digit combination using minimal cues in serial order.

Question 26 C

The antecedent in this case is the alarm sounding, which leads to Jacqueline's conscious behaviour of beginning her stretching routine and results in the consequence of minimising her back stiffness.

Question 27 C

A hypnotic state is an example of an induced altered state of consciousness as it is not naturally occurring, as opposed to sleep or a daydream.

Question 28 A

Claire is most likely in a relaxed state of ordinary wakefulness, which would typically record alpha brain waves.

Question 29 A

The body's sleep-wake cycle is largely controlled by the suprachiasmatic nucleus (SCN), an area of the hypothalamus which is just above the point where the optic nerves that connect the eyes cross (the optic chiasm) and acts like an internal body clock. The SCN receives information from the eyes about the amount of light present in the environment, and will adjust the sleep-wake cycle accordingly by sending neural messages to the nearby pineal gland to release melatonin.

Question 30 B

Dr Ginseng has used an experiment, as evidenced by the manipulation of the IV – the use of the sleep-inducing tea – to test its effect on the dependent variable (DV) – the reduction in the symptoms of insomnia (as measured by duration of sleep, quality of sleep and daytime attentiveness) – enabling him to make a cause-and-effect statement.

Question 31 D

Dr Ginseng's research investigation would be least effective in eliminating a potential placebo effect, as the participants would have an expectation that the sleep-inducing tea would lessen their symptoms of insomnia, and thus the variations in their beliefs across the two phases of the experiment could have an unwanted effect on the DV. The use of a counterbalanced repeated-measures research design would have effectively controlled both the order effect and any participant-related variables.

Question 32 C

The IV in this case was the consumption of the sleep-inducing tea, which was manipulated across the two weeks of the experiment to test its effect on the DV (the reduction in the symptoms of insomnia).

Question 33 C

The mean scores for duration of sleep in hours and minutes, self-rated quality of sleep and self-rated daytime attentiveness would provide a useful summary form of comparison between the two weeks of the experiment. The standard deviation as a measure of spread is of limited value without the mean scores to compare it to, and qualitative data is difficult to analyse and construct conclusions from.

Question 34 A

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

Question 35 B

Emma's daydream is an example of an altered state of consciousness (characterised by a reduced level of awareness of the external surroundings) in which she is experiencing a decrease in content limitations, as she may start to think about issues that extend well beyond the task at hand in the classroom.

Question 36 B

When under the influence of a stimulant, an individual is most likely to experience an increase in beta brain waves due to the excitatory effects of the stimulant. These effects increase physiological arousal, which in turn increases brain wave frequency and tend to result in a decrease in alpha, theta and delta brain waves.

Question 37 B

Moodiness is an affective (emotional) symptom of sleep deprivation. A shortened attention span, impaired hand-eye coordination and difficulty in performing tasks involving automatic processes are examples of cognitive and behavioural symptoms of sleep deprivation.

Question 38 D

A middle-aged adult tends to experience four or five 80–100 minute sleep cycles per night. The latter (fourth or fifth) cycles are characterised by longer periods of REM sleep as well as stages 1 and 2 NREM sleep, with the deeper NREM stages 3 and 4 typically occurring only in the first two sleep cycles.

Question 39 C

For the best results, Lou should be consistently exposed to the bright light early in the morning in order to advance his circadian rhythm so that melatonin can be released earlier, resulting in an earlier onset of sleep.

Question 40 A

A precipitating factor both increases the occurrence and contributes to the development of a mental condition.

Question 41 B

A perpetuating factor such as substance abuse will inhibit Bella's recovery from a mental health problem.

Question 42 C

In the treatment of phobias, benzodiazepines such as Lexapro work by mimicking the effects of GABA at their corresponding receptor sites on the postsynaptic dendrites and thus have an inhibitory effect on the central nervous system.

Question 43 D

Benzodiazepines such as Lexapro target the central nervous system, thus having a calming effect on the brain.

Question 44 B

A poor response to medication (Lexapro in this case) is a perpetuating risk factor to the development and progression of a phobic disorder as it inhibits the recovery from the condition. Genetic vulnerability is a predisposing factor, disorganised attachment is a precipitating factor and a balanced diet is a protective factor.

Question 45 C

An ethics committee would be most likely to grant permission to Dr Scollo to use placebos in her experiment with Lexapro if the participants are aware of their rights, such as their right to withdraw. The use of minors in an experiment requires the informed consent of a legal guardian, debriefing occurs at the conclusion of an experiment and placebos have no medicinal benefit.

Question 46 A

Secondary data is data collected from an external source; for example, results published from other researchers that investigated the effectiveness of alternative benzodiazepines. The other three options are all examples of primary data, which are collected directly from the researcher.

Question 47 C

According to the cognitive model in psychology, phobias result from the thought processes that influence our feelings and behaviour. Memory bias involves distorting the influence of present thinking and feelings based on the distorted or exaggerated recollection of previous experiences (selective memory). Classical and operant conditioning both apply to the behavioural model, whereas long-term potentiation (LTP) is a biological explanation.

Question 48 D

In order to build resilience, individuals facing adversity are best advised to focus on a combination of biological factors (such as good 'sleep hygiene' and a well-balanced diet), psychological factors (such as adopting cognitive behavioural strategies) and social factors (such as receiving social support).

Question 49 B

According to the transtheoretical model of behaviour change, a key influence on an individual's ability to successfully transition from one stage to another is self-efficacy – an individual's confidence in their ability to succeed at each stage of achieving behavioural change.

Question 50 D

Chris has reached the preparation stage, as he is ready to change. This is reflected by the development of an action plan that he is committed to starting shortly.

SECTION B**Question 1** (10 marks)

- a. As a result of regularly revisiting the details of the conversions of kph to mph, the neural pathways responsible for the memory trace will strengthen (and thus the neurons that have been firing together will become wired together). 1 mark
1 mark
- b. Glutamate is an excitatory neurotransmitter which is highly concentrated in the hippocampus and plays a crucial role in learning and memory. When the memory trace for the conversions are activated, the uniquely shaped glutamate neurotransmitters, which represent the 'keys', are released from the presynaptic neurons and bind with the corresponding matching-shaped glutamate receptors on the postsynaptic neurons – the 'locks'. 1 mark
1 mark
The excitatory effects of the glutamate make the postsynaptic neuron more likely to fire, which plays a key role in the LTP process. 1 mark
- c. The use of elaborative rehearsal of the conversions from mph to kph involves linking the formula to existing material in LTM. 1 mark
1 mark

OR

- The use of elaborative rehearsal of the conversions from mph to kph improves the organisation of the conversions in LTM (as well as providing additional cues to assist with retrieval). 1 mark
1 mark
- d. When Don is in his car he has aid of context-dependent cues such as, for example, the speedometer and the dashboard. 1 mark
1 mark
If he has learned to apply the conversion rule whilst viewing the speedometer, this will act as an environmental cue to assist his retrieval of the rule when required, as opposed to when he is outside his car and lacks this cue to assist in the retrieval of the conversion rules. 1 mark

Question 2 (13 marks)

- a. *For example:*
Charlotte could evaluate the accusation as significant, 1 mark
specifically a threat to her future at the school or a threat to her ATAR. 1 mark
Charlotte could also evaluate the accusation as insignificant, 1 mark
as she may feel confident that there is no proof of her cheating. 1 mark
- b. *For example:*
If Charlotte appraised the pending interview as significant – for example, a threat – 1 mark
then her secondary appraisal would involve an evaluation of her resources to cope with the stressor. 1 mark

- c. i.** An avoidant coping strategy involves efforts that evade a stressor and deal indirectly with it and its effects (that is, activity is focused away from the stressor and there is no attempt to actively confront it and its causes). 1 mark
- For example, any one of the following strategies involving behavioural or emotional disengagement:*
- denial
 - distancing
 - procrastination
 - fantasy or wishful thinking
 - escape
 - substance abuse
 - oversleeping
 - any other suitable example
- 1 mark
- ii.** *Any one of the following:*
- They allow for the conservation of energy to focus on other stressors that can be changed.
 - They can be more effective in coping with stress in the short term.
 - Ignoring a stressor for a couple of days while focusing on other things can provide ‘time out’ from the stressor while minimising potential stress from another source.
- 1 mark
- iii.** *Any one of the following:*
- They tend to be maladaptive.
 - They can trigger stress-related physical problems, such as hypertension and cardiovascular disease.
 - Long-term use of avoidance strategies can also contribute to other problems; for example, delinquency, socially inappropriate behaviours and/or substance abuse.
 - Over time, avoidances can prevent people from responding to stressors in constructive ways.
- 1 mark
- d.** Mr Harrington may have been asked a leading question by the other supervising teacher after the incident which possibly contained misinformation; for example, “Did you see Charlotte look at her phone during the SAC?” 1 mark
- He may have then combined the information from each source – that is, the details he could remember and some of the misinformation from the leading question. 1 mark
- This may have resulted in a false reconstruction of the memory during retrieval. 1 mark

Question 3 (3 marks)

The cerebral cortex is responsible for the storage of explicit LTMs 1 mark

along with the reconstruction of memory (it also plays a role in sensory memory and STM). 1 mark

The hippocampus is responsible for the consolidation and retrieval of explicit LTMs, as well as spatial memory, contextualising memory and linking emotion to memory (by working with the amygdala). 1 mark

Question 4 (2 marks)

Any two of the following:

- Fears can be acquired through classical conditioning (a form of behaviourism); in Little Albert's case, this was a fear of the white rat.
- A conditioned emotional response can be strong enough to result in a specific phobia.
- Specific phobias can potentially be generalised to other similar stimuli; for example, in Little Albert's case, these included rabbits, fur coats, dogs and a Santa Claus mask (all examples of stimulus generalisation) – although his reactions were slightly less fearful in comparison to the presentation of the white rat.

2 marks

Question 5 (5 marks)

- a. If Vera's parent(s) was/were neglectful during childhood and/or a source of distress as a result of past abuse, then she may have become confused when threatened, as the parent – who is the normal attachment figure – might also be the source of the threat. 1 mark
- This could have been a predisposing factor to the development of Vera's anxiety disorder, as she may lack emotional control as well as social skills. Vera may be excessively aggressive and find it difficult to manage stress, and she may view the world as an unsafe place. 1 mark
- b. Cumulative risk refers to the accumulation of biological, psychological and social risk factors that can either contribute to the development or exacerbate the severity of a mental condition. 1 mark
- Vera has maintained biologically protective factors including her diet and exercise, along with the social benefits that she enjoys from mixing with her training group. These will all reduce her cumulative risk of sustaining her anxiety disorder. 1 mark
- Psychological factors such as stress could outweigh the biological and social factors in terms of the cumulative risk of the progression of her disorder. 1 mark

Question 6 (7 marks)

- a. Night-shift work can disrupt the body's circadian rhythm, as our bodies are programmed to sleep at night and be wakeful and alert during the day. 1 mark
- Thus Zahara's regular night shift could trigger the development of a circadian rhythm phase disorder, which occurs when the internal body clock is malfunctioning as a result of a mismatch between internal biological cues and the external environment. Internal cues include the release of hormones such as melatonin, which is generally released late in the evening to induce sleep, and external cues include daylight. 1 mark
- If Zahara tries to sleep during the day, this could result in conditions such as insomnia or excessive daytime sleepiness, which can trigger cognitive, social and emotional impairment. 1 mark

b. *For example, any one of the following:*

- Zahara may experience reduced motor skills or coordination and thus may have an accident, such as falling down a flight of stairs.
- Zahara may experience microsleeps and thus may fail to respond to a phone call from a guest.
- Zahara may experience diminished performance on simple and monotonous tasks such as filing paperwork.

2 marks

1 mark for a suitable behavioural symptom.

1 mark for explanation as to how that symptom relates to Zahara's work performance.

- c. NREM sleep is largely believed to be important for physiological restoration. 1 mark
- REM sleep is largely believed to play a key role in cognitive processes – for example, memory consolidation. 1 mark

Question 7 (8 marks)

- a. Professor Brady could access a group of readily available children aged 11–12 years old. 1 mark
- For example, she could contact local schools and ask whether they could place an advertisement for volunteers in their school newsletter. 1 mark
- b. *For example:*
- Professor Brady could briefly expose a series of items, such as nonsense syllables or symbols, via a data projector. 1 mark
- She could then test the children via free recall of the items to determine how many items they have retained in their STM, providing a measure of capacity. 1 mark
- c. The mean would represent the average of a set of scores, such as the capacity of STM for the 100 participants tested. 1 mark
- This would provide a useful measure of central tendency that is comparable over time. 1 mark
- The standard deviation would provide a measure of the variation of the scores from the mean. 1 mark
- This would provide a useful point of comparison of the sets of data; for example, the capacity of STM in terms of the spread of the scores. 1 mark

Question 8 (12 marks)

- a. If the phobia only causes temporary and occasional impairment in daily function (for example, next week Frank will be capable of attending school each day of the week), then this would indicate that he merely has a mental health problem, as opposed to a mental illness, in which his level of functioning would be more disabling and chronic. 1 mark
- 1 mark
- b. A phobia is an intense, irrational and persistent fear of a specific object or situation. 1 mark
- 1 mark
- c. The behavioural model in this instance is classical conditioning. 1 mark
- As a child, Frank may have been involved in a traumatic car accident on a road, for example. 1 mark
- Thus exposure/potential exposure to roads and cars is now a conditioned stimulus which triggers fear and anxiety (the conditioned response). 1 mark

- d.** As the name implies, cognitive behavioural therapy uses a combination of cognitive therapy and behavioural therapy to treat a phobia – in this case, to change the thoughts and behaviour which perpetuate Frank’s phobia of roads and cars.

Cognitive therapy would focus on determining the cause of Frank’s cognitive distortions; that is, identifying the triggers of his maladaptive thoughts and feelings about roads and cars which contribute to his avoidance of them.

1 mark

It then would aim to change these thoughts and feelings about roads and cars through cognitive intervention, and challenging these cognitive interventions by gaining evidence on the level of distortion of their thought processes.

1 mark

Behavioural therapy in this case would involve dealing with Frank’s maladaptive behaviours by providing coping strategies to help him deal with his anxiety. These may include techniques such as exercise, breathing retraining and encouraging activities that might enhance his self-worth.

1 mark

- e.** *Any one of the following:*

- Frank would have a high level of functioning; he can effectively utilise his cognitive abilities at school.
- Frank would have a high level of social and emotional wellbeing; he is socially active with his peers and/or demonstrates a range of emotions that are appropriate for the situation.
- Frank demonstrates resilience; he can now adapt to stress caused by school and can employ coping skills as required.

2 marks

1 mark for a suitable indicator.

1 mark for a clear explanation and link to the scenario.

Question 9 (10 marks)

- **Evaluation of results:** The results reflect a significantly higher error rate when drivers complete the routine driving tasks on the simulation test with either a 0.05 BAC or after a full night of sleep deprivation in comparison to the baseline 0.00 BAC after a normal night of sleep. The error rate is more than four times higher (33.8% and 32.6% after a full night of sleep deprivation and a 0.05 BAC respectively). Note that both these figures have been calculated by deducting the percentage scores from 100% (that is, $100\% - 66.2\% = 33.8\%$ error rate when compared to the baseline error rate of $100\% - 93.1\% = 6.9\%$). For non-routine tasks, the effects of a full night's sleep deprivation have not had a significant impact on driver performance, as reflected by the similarity of the scores (28.8% error rate for the control state versus 29.9% for the sleep-deprived state). However, the 0.05 BAC has resulted in almost double the error rate compared with the other two conditions (49.9%).
- **Discussion of findings:** These findings are consistent with previous research completed in this area. The results highlight that both sleep deprivation and a 0.05 BAC have a similar effect on consciousness in terms of concentration, as reflected by the impairments demonstrated when completing automatic processes (tasks that require minimal mental effort) such as the routine tasks performed on the driver simulation tests. The results also highlight the effects of alcohol on ability to complete controlled processes – in this case, the increase in error rate of drivers competing non-routine tasks (which required a high degree of mental effort, particularly given the stressful nature of these tasks). Alcohol is a type of depressant which slows down central nervous system activity, causing slowed reaction time, impaired decision-making and a lack of motor control. This would explain the higher error rate on the non-routine tasks. Due to the stress of the non-routine tasks and the sleep-deprived phase of the experiment, the findings highlight that sleep deprivation does not significantly impair performance on stressful, controlled processes, as the nervous system can rapidly respond efficiently to unexpected events.
- **Discussion of validity and reliability of the method of data collection:** The use of the driver simulation is an objective (not subjective) measure of driver performance, which therefore would presumably be a valid measure of the accuracy of the effects of sleep deprivation and a 0.05 BAC on driver performance. The lack of control over the sleeping patterns in the first and third phases of the experiment could reduce the validity of the sleep variable. Given the results of the experiment are consistent with previous findings, along with the large sample size of 88 drivers, this would indicate a reliable set of results. However, the use of a convenience sample of convicted negligent drivers would diminish the external reliability, and thus the ability of Dr Deighton to generalise the findings to the wider population, as drivers with a flawless driving record were not represented in the sample.
- **Evaluation of research design:** The use of a repeated-measures research design would have effectively eliminated participant-related variables such as, for example, driver experience, driver skill or experience with alcohol. The validity and reliability of the results could be affected by the order effect, as the driver performance might have been enhanced on the second and third phases of the experiment due to the practice effect – that is, exposure to the driver simulation on the first phase of the experiment could have provided some insight and skill-based manoeuvring on the latter phases of the experiment. Therefore the results may lack internal reliability; if the experiment were to be repeated, the results may not be consistent if counterbalancing were to be employed in order to eliminate the practice effect.

Marking guide

Very high (9–10 marks)

The student has:

- provided a thorough and detailed analysis of the results
- skillfully linked the findings to the key psychological concepts involved
- provided a highly detailed analysis of the validity and reliability of the results
- accurately related the evaluation of the repeated-measures research design to the scenario

High (7–8 marks)

The student has:

- provided a thorough analysis of the results
- skillfully linked the findings to the key psychological concepts involved
- provided a detailed analysis of the validity and reliability of the results
- accurately related the evaluation of the repeated-measures research design to the scenario

Medium (5–6 marks)

The student has:

- provided a limited analysis of the results
- skillfully linked the findings to the key psychological concepts involved
- provided a limited analysis of the validity and reliability of the results
- related the evaluation of the repeated-measures research design to the scenario

Low (3–4 marks)

The student has:

- discussed the results, but has only related these to one or two of the relevant psychological concepts involved
- provided a somewhat generic explanation of the use of a repeated-measures research design

Very low (0–2 marks)

The student has:

- only addressed one or two of the criteria specified in the question