

VCE PSYCHOLOGY 2024

Unit 3 & 4 Trial Examination

Assessment Guide & Suggested Answers

Section A – Multiple Choice Answers

Question	Correct Answer	Explanations and Notes
1	C	The response is unconscious and is initiated by the spinal cord without conscious awareness of the brain.
2	C	Playing the violent video game would be stressful and would have used cortisol that was already within the peripheral nervous system.
3	B	It is a controlled experiment as the researchers were manipulating an IV (type of video game) to see the impact it had on the DV (cortisol levels).
4	B	They are more likely to view the situation as stressful challenge and believe they have the resources required to cope as they are actively looking at the situation in a positive light.
5	B	This method has been introduced after their initial strategies of venting and denial have been unsuccessful, therefore they are adapting their approach to try and find a more successful method.
6	A	Self-reports are an effective way of measuring psychological, covert behaviours. It is not an objective method, and can also collect qualitative data, depending on the questions being asked. It tends to be one of the most effective ways to collect data from a large sample.
7	A	Valerie has conducted a literature review as she has collected and analysed secondary data from other people's scientific findings.
8	D	The gut and brain communicate via the vagus nerve not the spinal cord. Also, the relationship is considered to be a bidirectional one, not a bidirectional relationship.
9	B	Vera experienced improved sleep which is positive reinforcement. This is because something pleasant (improved sleep) was added to the situation, making her more likely to eat well in the future. Jeremy experienced fewer headaches, which is negative reinforcement. This is because something unpleasant (the headaches) was taken away, making him more likely to eat well in the future.

10	D	Unconscious behaviours happen outside of the person's conscious awareness. Digesting our food is an example of this and therefore the activity of the gut-brain axis is a suitable example. Conscious behaviours are voluntary and completed with awareness, but the example of having your pupils dilate when you are scared is an unconscious response. Unconscious behaviours are not only activated by the spinal cord, but they can be initiated by many parts of the body.
11	B	Observational learning is an example of a social cognitive theory, here the learner needs to think and decide whether there is suitable motivation to complete the behaviour. From a behaviourist perspective, which includes classical and operant conditioning, the learner must overtly demonstrate the behaviour to indicate that learning has occurred. The remaining options only apply to the social cognitive perspective.
12	B	This is an example of a mixed design experiment. The between subject design element was evident when the participants were allocated to either the juggling or the non-juggling group. The within subjects design element was evident when the participants completed multiple brain scans over the duration of the experiment and their brain densities were compared over time. As both elements are included in the research it is considered to be a mixed design controlled experiment.
13	B	The experimental group experienced LTP as they repeatedly coactivated the neural pathways associated with juggling which resulted in stronger connections and was seen in the brain scan as having greater density. After three months of not juggling, they experienced LTD as these neural pathways were not frequently coactivated, so the density of these brain areas became weaker. The scenario states that the control groups' scans did not change throughout the experiment, so they did not experience LTP or LTD.
14	B	The participant must be told about the true nature and risks at the start of the experiment; therefore, option A is incorrect. Debriefing occurs at the end of the experiment not at the start. Option D was correct in its application, but it is an ethical concept and the question asked for an ethical guideline.
15	A	Percentage change demonstrates the proportional difference that has occurred within the participants over different testing periods. Therefore, as they were testing the memory abilities of the same person before and after the fragrance was released, using percentage change controls for the extraneous variable of natural memory ability, so it doesn't become a confounding variable.
16	C	The neocortex is associated mainly with storing explicit memories. The basal ganglia would be involved if habitual behaviours were evident before the person goes to bed, or if completing sequenced motor movements. The amygdala is active when encoding implicit emotional memories. The hippocampus consolidates explicit memories and converts short term memories into long term memories.

17	B	Repeatability acknowledges the closeness of the agreement between the results of the study and subsequent investigations when conducted under very similar conditions.
18	B	Asha is still able to recall information about the event, there is no problem with her memory ability, but she will experience difficulties being able to visualise the events that took place in her mind's eye.
19	A	Vincenzo is watching his coach (attention) and has the desire to compete at a high level (motivation). It does not mention Vincenzo's need to remember the information or the reward he will receive when he competes at a high level.
20	D	Some of the definitions lacked precision. A - Generally areas of the brain that have been damaged are unable to be repaired. B - The definition is more appropriate for rerouting not sprouting. C - is incorrect and would not be beneficial for Vincenzo. D - is the most correct response and includes key terms that are relevant to rerouting.
21	A	Psychoeducation includes providing information about mental disorders to patients and their families so that they can provide support.
22	D	Answer D is the only correct response because in EMG, the electrodes are attached to muscles, and for EOG, electrodes are attached to the skin around the eyes.
23	A	Irritability and feeling annoyed are both affective effects, and impulsive behaviour is a behavioural effect of sleep deprivation.
24	D	Indigenous histories written by non-Indigenous people would not promote Indigenous cultural continuity.
25	B	Being awake for 24 hours has a similar level of impact to someone's functioning as having a blood alcohol concentration of 0.10%.
26	B	Bright light exposure should occur early morning for DSPS to try and move their circadian rhythm by promoting wakefulness in the morning.
27	C	Individuals can exercise throughout the day. For sleep hygiene, it's recommended that individuals avoid doing strenuous exercise in the couple of hours before sleep.
28	D	It would be an unconscious response when the clown initially scared her (and her heart rate increased), whereas running away from the clown is a conscious response as it involves awareness.
29	B	Classical and operant conditioning are psychological factors. Classical conditioning precipitates the phobia, whereas operant conditioning perpetuates the phobia.
30	A	CBT is a psychological treatment option for phobia and involves individuals challenging unhelpful thought patterns and emotions.
31	C	Hannah has the persistent and irrational fear which signifies that she most likely has a phobia, Mimi experiencing stress when seeing the clown is a normal response and Chiara thinking ahead to the future about the possibility of seeing the clown is an example of anxiety.

32	B	Since Gio has been feeling flat for a number of weeks, it is likely he is experiencing a mental health problem, but not yet a mental disorder as the symptoms have not been present for several months.
33	B	The most correct answer is Answer B since it is common for Aboriginal and Torres Strait Islander frameworks on mental wellbeing to include the importance of relationships and connection to culture. Not all are focused on history which is why D is incorrect.
34	B	Deception isn't always required in research, and the other answer options would all need to be considered, so Answer B is the least appropriate.
35	C	Answer C is correct. A - describes a systematic error (rather than a random error). B - describes a personal error (rather than a systematic error), and D - is incorrect because errors are possible in all research.
36	A	The median is the best measure of central tendency to use when there are outliers in data sets.
37	C	Christine is experiencing sickness, however she is still able to go about daily activities (such as going to work), therefore it is most likely she's in resistance.
38	C	When there is less light, the suprachiasmatic nucleus detects this and sends signals to the pineal gland to secrete melatonin. Melatonin promotes sleep.
39	A	Remi's body temperature starting to drop and that she is easily awoken indicates she's most likely in NREM Stage 1.
40	D	Clothing is not a zeitgeber (environmental cue).

END OF SECTION A

Section B – Short Answer Questions

Below are suggested responses which do not necessarily include every possible answer.

Question 1 (8 marks)

- a. *Definition:* The commitment to maximising benefits and minimising the risks and harms involved in taking a particular position or course of action. 1 mark

Application to scenario: The researchers would try to ensure that Benny is provided with as many benefits and positive aspects associated with participating in the research as possible, (such as access to medication and assistance) while attempting to reduce the negative effects associated with being in the research (such as distress when discussing his memory loss). 1 mark

- b. *Advantage:* Any one of the following for one mark, however they must relate to the participant not the research. 1 mark

- Benny would receive detailed and insightful analysis about his own experiences and problems associated with his memory decline.
- Benny could receive a unique treatment plan, designed from the information he revealed, and the data obtained in the tests he completed.
- Benny might feel that ethical guidelines, such as beneficence, were upheld perhaps more than if he was participating in a large piece of research as the researchers were able to carefully monitor his wellbeing throughout the procedures.

Disadvantage: Any one of the following for one mark, however they must relate to the participant not the research. 1 mark

- As the case study method investigates a concept thoroughly, it might be confronting and confusing for Benny to be asked so many questions, especially by someone he doesn't know very well. (This could be exacerbated as he may not remember the person conducting the research over the course of the investigation due to his memory decline).
- It might be harder to maintain anonymity (as only a small group of people are part of the study and an in-depth investigation is conducted so personal information disclosed may be easily recognisable when reported).

- c. *Identification of a brain structure:* hippocampus 1 mark

Explanation of how the hippocampus is involved in constructing an imagined future.

In order to visualise a possible imagined future, Benny would need to access his (explicit and episodic) autobiographical memories. However, due to damage in his hippocampus this knowledge might not have been consolidated and stored into long term memory.

Therefore, he wouldn't have a strong foundation to create an imagined future. 1 mark

Identification of a brain structure: neocortex 1 mark

Explanation of how the neocortex is involved in constructing an imagined future:.

Benny may also experience damage in the neocortex which means that previously stored (episodic and explicit) autobiographical memories may no longer be able to be retrieved/ or more recent memories couldn't be stored due to damage in the neocortex. Therefore, he couldn't access these memories, which are needed to construct an imagined future. 1 mark

Question 2 (7 marks)

- a. *Identification: young adult* 1 mark

Justification: The hypnogram shows that the person is getting about 7 hours of sleep which is within the range for young adults (7-9 hours). /Around 20% of the sleep cycle is spent in REM and the proportion of time spent in NREM 3 gradually decreases through each sleep cycle.

1 mark

- b. *Process of neurotransmission:* 3 marks

GABA is released from the axon terminals of the pre-synaptic neuron and travel across multiple synaptic gaps [1 mark] to receptor sites on the dendrites of post-synaptic neurons [1 mark].

GABA causes an inhibitory effect on the post-synaptic neuron (making it less likely to generate an action potential) [1 mark].

- c. *Description of data:* 2 marks

Hypnograms collect objective data as the hypnogram is not a personal opinion/often uses scientific data from devices such as EEGs. [1 mark]

It is also quantitative data as the hypnogram contains numerical information. [1 mark]

Question 3 (10 marks)

- a. *Example of an implicit memory:* Sofia and Victoria knew how to walk/ knew how to sit on a chair. 1 mark

Justification of implicit memory: Knowing how to walk or sit on a chair was an implicit memory because it did not require conscious recall. 1 mark

Example of an explicit memory: Sofia and Victoria knew the rules of musical chairs. 1 mark

Justification of explicit memory: Knowing the rules of the game was an explicit memory because it requires conscious recall. 1 mark

- b. *Identification of stage:* reproduction 1 mark

Justification: As Izzi has broken her foot she does not have the physical ability to demonstrate the behaviour of walking quickly around the room. 1 mark

- c. *Identification of behaviourist approach:* Classical conditioning 1 mark

Three-phase model of conditioning: 3 marks

Before conditioning, the neutral stimulus (NS) of hearing the music produces no relevant response. The unconditioned stimulus (UCS) of playing a game of musical chairs produces the unconditioned response (UCR) of having an increased heart rate due to playing musical chairs. [1 mark]

During conditioning, the NS, the music is repeatedly presented just before the UCS, playing musical chairs, which produces the UCR having an increased heart rate due to playing musical chairs. [1 mark]

After conditioning, the conditioned stimulus (CS) of hearing the music alone produces the conditioned response (CR) of having an increased heart rate due to the music. [1 mark]

Question 4 (8 marks)

- a. *Identification of investigation methodology*: correlational study 1 mark

Identification of a feature of the methodology: determines if there is a relationship/trend between two variables. 1 mark

- b. *Explanation of process of neurotransmission*: 3 marks

Neuromodulators are released from the axon terminals/synaptic buttons of pre-synaptic neurons. [1 mark]

Neuromodulators travel across multiple synapses. [1 mark]

And bind to receptor sites on the dendrites of multiple post-synaptic neurons. [1 mark]

- c. *Definition of reproducibility*: Reproducibility refers to consistency of results of the same measure carried out under different conditions. 1 mark

Statement about reproducibility: This study has low levels of reproducibility as the stress levels are a self-reported measure of stress which is subjective. Subjective data makes reproducibility challenging. 1 mark

- d. *Identification of trend in data*: As the months progress in Year 12, gut microbiota levels decrease, and stress levels increase / there is a negative correlation. 1 mark

Question 5 (15 marks)

- a. *Description of the between subjects element*: the between-subjects design element was evident as the participants were only allocated to the spider simulation condition or the control group. 1 mark

Description of the within subjects element: the within-subjects design element was evident as their response to treatment/no treatment was measured on three occasions, (before, after two weeks and after four weeks). 1 mark

- b. *Identification of the allocation method*: random allocation 1 mark

Explanation of why researchers used random allocation: Researchers used random allocation to attempt to equally/evenly distribute the participants and their differences across the two conditions/ to attempt to control for individual differences evident within the participants. 1 mark

c. *Strength of simulation: One of the following for one mark.* 1 mark

- Allows concepts that could be dangerous or distressing, (such as overcoming phobias) to be investigated in a safer and more ethical manner.
- Provides insight into potential circumstances or events that might be difficult to encounter naturally and objectively in real-life (interacting with spiders).

Weakness of simulation: One of the following for one mark. 1 mark

- Due to the artificial setting, it may not truly reflect reality, (participants might respond differently to the spiders in the simulation compared with how they would respond in real life).
- Can be time-consuming and expensive
- Subject to programming and human error

d. *Outline how the participant learns a relaxation technique:* The participants should learn a relaxation strategy so that they can use it to decrease their physiological symptoms when confronted by a phobic stimulus. E.g. muscle relaxation, visual imagery, breathing technique. 1 mark

Develop a fear hierarchy: The participants should break down interactions with the spiders that causes the phobic response from least fearful and anxiety producing activities to most feared and anxiety producing activities. This is known as a fear hierarchy. 1 mark

Systematic step-by step exposure and reconditioning: the participants should be exposed to the least anxiety producing object, for example: a picture of a spider and then pair it with the relaxation technique. They would not move onto the next stage until their physiological fear responses have subsided. 1 mark

Top of the hierarchy: The participant would continue all the way to the top of the hierarchy and be exposed to the most fear inducing stimulus, holding a spider without feeling a fear/stress response. 1 mark

e. **Marking Guide:** 3 marks awarded as outlined below.

Use of all four data points in the conclusion. 1 mark

Experimental group: Correct indication that the app continues to help participants/increases the amount of time exposed to the spider. 1 mark

Control group: Correct description that the control group has differing responses, and that providing no intervention does not help treat phobias. 1 mark

Sample Response

Conclusion: Participants who used the virtual reality app were able to increase the amount of time they kept their hand in an enclosure with spiders after 2 weeks to 53 seconds and improved again after 4 weeks to 165 seconds, demonstrating that treatment was effective.

This contrasts with the participants in the control group who, after 2 weeks showed a small improvement, as their time increased by 7 seconds, but then showed a decline in progress after 4 weeks as their time decreased by 20 seconds compared with pretraining levels, showing that having no treatment is not an effective way to treat phobias of spiders.

- f. *Explanation of non-maleficence:* involves avoiding the causations of harm; however, as a position or course of action may involve some degree of harm, the concept of non-maleficence implies that the harm resulting from any position or course of action should not be disproportionate to the benefits from any position or course of action. 1 mark

Reference to control group: Non-maleficence is important to consider because the control group were required to place their hand in an enclosure with spiders on three occasions and would have experienced considerable distress. However, they were not provided with the opportunity to learn to overcome their phobia through the virtual reality app, therefore the harm was disproportionate to the benefits experienced by the control group. 1 mark

Question 6 (7 marks)

- a. *Sensory information and its role in a spinal reflex:* Sensory information was received by Rhea's sensory neurons (in the peripheral nervous system) when she stepped on the pin. The information then travels via afferent tracts/pathways to the spinal cord. 1 mark

Spinal cord and its role in a spinal reflex: When Rhea's spinal cord received the sensory information, it interpreted it as harmful and initiated the reflex arc. 1 mark

Motor information and its role in a spinal reflex: The message then returned (to the peripheral nervous system) and motor neurons transmitted the message via efferent tracts/pathways to her muscles which enabled her to quickly jump away from the pin. 1 mark

Marking Note: If the response mentions that the information travelled to the brain, only the first mark for the role of sensory neurons can be given.

Responses must refer to the spinal cord not the spine to receive the second mark.

Elements of the question that refer to neurons moving rather than the message moving through the neurons should not be awarded the mark.

- b. *Role of the cerebellum in dancing:* Rhea's cerebellum would help her to coordinate her movements and maintain her posture and balance. 1 mark

Role of the amygdala: Rhea's amygdala would be active as she encodes her emotions experienced while dancing. For example, she might feel happy when she executes a difficult move. 1 mark

- c. *Acknowledgement of attention in enhancing wellbeing:* To enhance her wellbeing, Rhea needs to focus her attention on her breathing and awareness of being present in the moment. 1 mark

Acknowledgement of acceptance in enhancing wellbeing: To enhance her wellbeing, Rhea needs to allow thoughts, sensations and feelings to be experienced without judgement. 1 mark

Question 7 (8 marks)

- a. *Definition of Country:* Country refers to the traditional lands of a particular Indigenous language or cultural group, including both geographical boundaries and the spiritual, emotional, and intellectual connections to and within it. 1 mark

Explanation of importance of Country: First Nations Australians have a deep respect for Country
One of the following points for one mark: 1 mark

- Relationship with Country is a significant part of culture
- Country is viewed as sentient
- Country allows for multimodal ways of being and knowing
- Country allows for a deeply ethical and spiritual cultures
- Country influences the health and wellbeing of all entities in the system

- b. *Similarities between the Multi Store model and Songlines:* One of the following points for one mark. 1 mark

- They can both be helpful in our understanding of memory
- The elaborative rehearsal part of the Multi Store Model of memory is similar to how Songlines can enhance encoding of memories.

Differences: One of the following points for one mark. 1 mark

- The Multi Store Model is a non-Indigenous understanding of the stores in memory whereas Songlines are an Aboriginal tradition that are significant for more than memory
- The Multi Store Model contains three stores of memory, whereas Songlines do not outline that there are particular memory stores
- The Multi Store Model does not take into account how Country can store memories/knowledge, whereas Songlines acknowledge that Country can hold memories/knowledge.
- The Multi Store Model does not take culture into account, whereas Songlines are a deeply cultural practice.

Explanation of how they impact memory: The Multi Store Model is a conceptual model for which we can conceptualise memory, whereas Songlines can be considered a mnemonic device which assists in the encoding, storage and retrieval of memories. 1 mark

- c. *Definition of Songlines:* Songlines are sung narratives where **knowledge is embedded** in multimodal ways, and the person must **travel a journey** either physically or metaphorically across **Country**. 1 mark

Link to cultural continuity: Cultural continuity refers to the ability to preserve the historical traditions of a culture and carry them forward with that culture into the future. 1 mark

Connection between Songlines and cultural continuity: Songlines are a tradition that facilitates cultural continuity as they are taught to subsequent generations. 1 mark

Question 8 (7 marks)**a.** *Explanation of sensory memory and how information is transferred to STM.*

When information from the memory seminar enters Asaf's sensory memory he must pay attention to it so that it can be transferred to STM. 1 mark

Explanation of STM and how information is transferred to LTM.

In STM, Asaf would rehearse the information so that it would be transferred/encoded/stored into LTM. 1 mark

Explanation of LTM and how information is retrieved to STM.

Asaf would actively retrieve the knowledge he read about from his LTM and retrieve it back to his STM. 1 mark

b. *Example of negative reinforcement: One of the following points for one mark.* 1 mark

- Taking away the feeling of annoyance of having lots of homework to do
- Taking away the need to continue to work when the alarm goes off
- Removal of homework tasks
- Removing conversations with parents and teachers about missing work that is overdue

Description of negative reinforcement: An unpleasant stimulus is removed from the situation which make Asaf more likely to repeat using the timer again in the future. 1 mark

c. *Similarity:* both consequences encourage the likelihood of the behaviours being demonstrated in the future. 1 mark

Difference: one of the following responses for one mark. 1 mark

- Negative reinforcement takes a stimulus away, whereas positive reinforcement adds a stimulus.
- Negative reinforcement focuses on an unpleasant stimulus, whereas positive reinforcement focuses on a positive stimulus.

Question 9 (10 marks)**MARKING GUIDE**

	<u>Very Low</u>	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>Very High</u>
1. Use of Key terminology	Makes incorrect attempts to use key science skill terminology.	Attempts to use the key science skill terms mention in the question but not all are included.	Correctly uses all key science skill terminology.	Correctly uses and elaborates on the key science skill terminology in relation to the question.	
2. Hypothesis and rationale	Attempts to formulate a hypothesis, but key information is incorrect.	Constructs a hypothesis but not all information included.	Constructs a hypothesis with all of the key information from the scenario included.		
3. Evaluation research #1	States some of the key science skill terminology but omits some.	States most of the key science skill terminology and elaborates on the specific circumstances of research #1.	Links the key science skill terminology to the examples in research #1.	Outlines research #1 by linking to key science skill terminology and referring to strengths and weaknesses.	Evaluates each part of research #1 by linking to key science skill terminology and outlining strengths and weaknesses.
4. Evaluation research #2	States some of the key science skill terminology but omits some.	States most of the key science skill terminology and elaborates on the specific circumstances of research #2.	Links the key science skill terminology to the examples in research #2.	Outlines research #2 by linking to key science skill terminology and referring to strengths and weaknesses.	Evaluates each part of research #2 by linking to key science skill terminology and outlining strengths and weaknesses.
5. Reproducibility	Formulates a generic statement about reproducibility.	States which research option is more reproducible with no explanation.	Correctly justifies which research option is more reproducible.		

If the response is mostly placed in the highest-grade boundaries, it is eligible to receive at least 8 marks. The model response provided below would reflect a response that would be placed in the highest-grade boundaries and would be awarded full marks.

BetterSleep Research Proposal

This study investigating the effects of the BetterSleep goggles is important to progress the field of sleep research. Sleep quality varies dramatically and can have a tangible impact on people's level of functioning.

Hypothesis

It is hypothesised that Australian university students who use the BetterSleep goggles will have improved sleep quality, compared to those who do not use any sleep interventions.

Evaluating Research Option #1

Random sampling is a sampling method which is less representative of the population than stratified sampling, however since random sampling allows the participants to be gathered by chance, it does reduce the likelihood of potential participant differences.

The use of non-random allocation could potentially lead to participant differences, so random allocation would be a better allocation method to use when there is a between-subjects or mixed design.

The use of a mixed design is beneficial as it allows researchers to compare the pre and post test results of participants sleep quality which will assist them in drawing conclusions about the effectiveness of BetterSleep on participants' sleep quality.

The requirement of participants to sleep in a university sleep laboratory is beneficial in terms of having all of the required equipment onsite, however this could be a potential extraneous variable as participants may have lower sleep quality due to the unfamiliar sleep environment.

The controlled variables are helpful in allowing the researchers to be better able to determine whether there is a cause-and-effect relationship between the use of BetterSleep goggles and sleep quality.

This research option contains more objective ways that the DV is measured (through quantitative sleep measurements such as EOG and EEG).

Evaluating Research Option #2

Stratified sampling is the best sampling method to use when recruiting participants for a study as it ensures that there is a representative proportion of subgroups in the sample (that are represented in the wider population).

The use of random allocation means that each participant has an equal chance of being placed in either the control group or the experimental group and reduces participant differences.

This particular research benefits from a between-subjects design where the control group either does not wear goggles or wears goggles that do not do anything, and the experimental group wears the BetterSleep goggles. This particular experimental design does have limitations in the effect of potential participant differences and the requirement of a larger sample size.

It is beneficial in this research option that participants are able to sleep in their own beds as this is the 'normal' environment for each participant and makes it more likely that they will have less disrupted sleep (or other impacts that might occur if they were not sleeping in their usual environment).

The controlled variables are helpful in allowing the researchers to be better able to determine whether there is a cause-and-effect relationship between the use of BetterSleep goggles and sleep quality.

This research option contains more subjective ways that the DV is measured (through participants rating their sleep quality), however also using an EMG provides a quantitative and objective way of measuring data. Both are useful in the measurement of sleep. Perhaps the use of other quantitative ways of measuring sleep such as an EEG might also benefit in adding data to allow for more valid tracking the stages of sleep.

Reproducibility

Research Option #1 would be the most reproducible study as the primary data collected is more objective (EOG and EMG) and therefore not based on personal opinions. This enhances reproducibility as it is more likely to obtain similar results if this study was conducted with different conditions.

END OF SUGGESTED ANSWERS