

VCE Psychology Units 3 & 4

Written Examination

Suggested Solutions

SECTION A: MULTIPLE-CHOICE QUESTIONS

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SECTION A – MULTIPLE-CHOICE QUESTIONS

Question 1 A

Walking is an **automatic** process that can be completed with minimal mental effort. This enables Amandine to use **selective attention** to negotiate her complex contractual negotiation which requires additional mental effort.

Question 2 D

K complexes are low frequency, high amplitude brain waves that last for approximately one second.

Question 3 C

According to the restorative theory of sleep, the time that animals who have multiple predators will sleep depends on whether they are more vulnerable during sleep. For example, cows spend less time sleeping as they are out in the open. Animals who are less vulnerable during sleep, for example, burrowing animals, sleep more because their reduced exposure protects them from predators during sleep.

Question 4 C

Due to REM paralysis, a sleeper will generally experience a higher level of electrical activity of the muscles during NREM sleep.

Question 5 A

According to the restorative theory of sleep, REM sleep has a cognitive function, for example, memory consolidation. Thus impaired memory storage would be a symptom of REM deprivation that is due to a sleep disorder such as insomnia.

Question 6 B

According to the restorative theory of sleep, a lack of NREM sleep would be likely to have a physiological effect (rather than a cognitive effect that would occur with REM sleep), such as a less effective physiological recovery from exercise.

Question 7 B

An elderly person would be expected to have approximately 20% of their sleep in REM and 80% in NREM, with the vast majority of that (if not all) in a light stage 1 and 2 of NREM.

Question 8 B

During a microsleep, the EEG would be most likely to detect alpha and theta brainwaves, resembling the EEG patterns of a light sleep.

Question 9 B

The object would be detected on the right side of the retina (after crossing over at the optic chiasm) and be processed on the right side of the occipital lobe.

Question 10 C

The patient would recognise the object but would be unable to name it; as the corpus callosum has been severed, the information could not be transferred to the left verbal hemisphere.

Question 11 A

Due to the small population of split-brain patients, a convenience sample is the only suitable form of sampling given the requirements of a large sample.

Question 12 D

The primary motor cortex in the left frontal lobe is responsible for movement in the left hand.

Question 13 C

Visual information is processed in the occipital lobe; sensation in the form of touch and taste are processed in the parietal lobe; and sounds and smell are processed in the temporal lobe.

Question 14 B

Object recognition is largely the domain of the right cerebral hemisphere.

Question 15 B

As well as speech production, Broca's area is responsible for analysing the grammatical structure of others.

Question 16 B

Sufferers of Broca's aphasia are generally aware of their speech impairment, while sufferers of Wernicke's aphasia are generally not aware of their speech impairment.

Question 17 A

The dendrites are the branched projects at the end of a neuron that receive electrochemical messages in the form of neurotransmitters, which bind with the receptor sites (on the dendrites) and thus enable communication between neurons.

Question 18 A

Sensory memory declines the least with age, short-term and working memory decline largely due to the slowing of the nervous system, and episodic memory (a type of long-term memory) starts to decline during old age.

Question 19 B

Karen has chunked twelve digits into six double-digit numbers, which increases the capacity of short-term memory without linking the bits of information to existing memories.

Question 20 A

The twenty-four-hour delay means that there would be no recency effect, only a primacy effect. This means that only the first few names would be recalled.

Question 21 C

According to the Ebbinghaus forgetting curve, approximately 20% of the material learned would be retained after a twenty-four-hour period.

Question 22 **A**

Semantic processing is the deepest form of encoding. It involves storing information in memory according to its meaning.

Question 23 **A**

The presidents' names are a type of semantic memory (stored explicitly).

Question 24 **B**

The central executive directs the episodic buffer to retrieve information from long-term memory.

Question 25 **A**

The central executive division of Baddeley and Hitch's working memory is limited in terms of its ability to generally only perform one task at a time.

Question 26 **C**

Iconic memory has a virtually unlimited capacity for a fraction of a second.

Question 27 **C**

According to the semantic network, information that is stored hierarchically with short and meaningful links is most efficiently retrieved.

Question 28 **D**

Recognition involves identifying correct alternatives from previously learned information and is a more sensitive measure of retention than recall.

Question 29 **A**

Zach is experiencing proactive interference, as the previously learned information is affecting his ability to retrieve the newly learned name.

Question 30 **C**

This is an example of how the absence of context-dependent cues have led to a retrieval failure of the memory of the student's name.

Question 31 **C**

This involves a conscious blocking of the incident from Dwight's conscious awareness, thus providing a defence mechanism for Dwight's well-being.

Question 32 **D**

Mnemonics are an effective means of enhancing the encoding and hence storage of information in long-term memory. This is done by linking information to existing memories in long-term memory.

Question 33 **D**

Julius's learning is a unique form of learning that the brain does not expect to be exposed to. Thus it is a form of experience-dependent learning, as the brain needs to be exposed to the environmental stimuli for the learning to occur.

Question 34 B

Julius has formed an explicit memory which needs to be brought consciously to mind to recall the steps involved. Exposure to this environmental experience has resulted in the establishment of new synaptic configurations of the brain, which is an example of adaptive plasticity.

Question 35 A

Julius's learning has occurred indirectly through the observation of his mother's behaviour and a noting of the consequences. Thus his learning has been vicariously conditioned.

Question 36 C

Myelination is a feature of developmental plasticity. Sprouting and rerouting are features of adaptive plasticity.

Question 37 D

Myelination involves the surrounding of a cell's axon, thus providing both protection of the axon itself and a means of enhancing the transmission of neural impulses in the neuron.

Question 38 D

A child learning the native language of their parents is an example of experience-expectant learning (the brain expects to be exposed to language) that is best learned during the sensitive period for language acquisition (between the ages of one and a half to three years.)

Question 39 C

A child learning a second language is an example of experience-dependent learning (the brain does not expect to be exposed to multiple languages) that is best learned during the sensitive period for language acquisition (between the ages of three to eight years).

Question 40 B

In classical conditioning, extinction occurs when the unconditioned stimulus (for example, meat powder for Pavlov's dog) is no longer presented (which eventually resulted in a failure of the conditioned stimulus (bell) eliciting the conditioned response (salivation in anticipation of the meat powder).

Question 41 B

Eliza's condition applies to Axis II of the DSM-IV-TR multi-axial approach because it is a clinical disorder; it is a temporary condition that can be treated by her mental-health clinician.

Question 42 C

Eliza's conditioned response to exposure to heights would be triggered by her sympathetic nervous system, which is a division of the autonomic nervous system.

Question 43 C

The amygdala is responsible for Eliza's fear conditioning of heights.

Question 44 A

Eliza's treatment would involve her mental-health clinician exposing Eliza to her conditioned stimulus (heights) at an extreme level; for example, being placed in the Skydeck room at Eureka Tower for an extended period.

Question 45 **C**

Systematic desensitisation (or graduated exposure) is a more effective form of treatment for phobias which involves the principles of classical conditioning and exposes a patient to successive levels of a fear-evoking stimulus.

Question 46 **C**

The antecedent condition was approaching the Myki machine.

Question 47 **A**

The consequence was avoiding a train fine, that is, negative reinforcement.

Question 48 **B**

The operant response was touching on the Myki card.

Question 49 **B**

Shaping would be a behavioural modification technique used for behaviour that is unlikely to occur naturally or be performed on the first attempt. A child could be rewarded for behaviour that edges closer to the target behaviour. For example, start by rewarding a child for correctly crossing the laces, then reward the child for taking the left lace up and under the right lace, and so on.

Question 50 **D**

The cost (loss of access to the Year 12 common room) for the response (leaving the common room messy) was intended to decrease the targeted behaviour (making a mess) by removing a desirable stimulus (access to the common room).

Question 51 **A**

Partial reinforcement is a feature of operant conditioning, but not classical conditioning, in which the consequences of behaviour (the schedule of reinforcement) leads to the likely replication of the behaviour.

Question 52 **B**

Operant conditioning was founded on the principles of trial-and-error learning, that is, the law of effect.

Question 53 **C**

Annabel's conditioned (reflexive) response has been classically conditioned and has not been extinguished in the past; thus, spontaneous recovery has not occurred.

Question 54 **A**

According to Skinner, due to the unpredictability of the timing of the reinforcer, which occurs at random time intervals, the variable-interval schedule of reinforcement results in the slowest response rate.

Question 55 **D**

'Little Albert's' fear of the white rat should have been extinguished as part of the debriefing process to remove any negative consequences that occurred as a result of the experiment.

Question 56 **C**

The DSM-IV-TR has a higher inter-rater reliability, which is an indication of the consistency of diagnosis across a broad range of mental-health conditions.

Question 57 **D**

Spatial neglect is an example of a medical approach to determining abnormal behaviour.

Question 58 **A**

Being bullied at school would be considered a social factor that contributes to stress.

Question 59 **C**

Activation of the fight-flight response results in constriction of the blood vessels in the skin, which makes the blood sticky and thus reduces blood loss in the event of a cut.

Question 60 **B**

After receiving some news in the mail, Britt is experience eustress, which can described as a positive psychological response.

Question 61 **D**

Investigating what his insurance policy will cover in terms of costs, as well as his legal options in defending any charges that may be pending, indicates that Xander is managing the problem by devising a strategy to take control of the situation; this is indicative of a problem-based coping strategy.

Question 62 **A**

Xander distancing himself from the problem by avoiding thinking about the costs involved and choosing to concentrate on his performance in his new job is an example an emotion-based coping strategy.

Question 63 **C**

Evaluating internal coping options is an example of a secondary appraisal; in this case, by determining his resolve to overcome the consequences of the accident.

Question 64 **B**

Meditation is a purposely induced altered state of consciousness, while relaxation occurs in a normal waking consciousness, where the individual still has awareness of their internal state and external environment.

Question 65 **B**

An EOG is only useful in sleep studies for determining if an individual is experiencing REM sleep or NREM sleep; it provides no indication of a physiological response to stress.

SECTION B – SHORT ANSWER QUESTIONS**Question 1***Any two of:*

- Time distortions: Brigitte may perceive time elapsing at a slower or faster rate.
- Cognitive and perceptual distortions: Daydreaming can reduce our sense of pain (a perceptual distortion). It can lead to difficulty maintaining attention; for example, daydreaming may reduce our understanding of a lecture given in class (cognitive distortion).
- Self-control: We may not notice that we are dribbling whilst sucking on a pen.
- Emotional awareness: Daydreaming can enhance mood, as it is usually a positive way of escaping a boring/unpleasant situation; or it can decrease our mood, or flatten our responses to emotional situations.

2 marks

*2 marks for any two of the above points***Question 2**

	NREM stages 1 and 2	NREM stages 3 and 4
Sleep spindles/ K-complexes	occur during stage 2	do not occur
EEG	higher frequency/lower amplitude (alpha/theta waves)	lower frequency/higher amplitude (theta/delta waves)
Difficulty waking	not difficult (a light sleep)	more difficult (a deep sleep)
Sleep phenomena, for example, night terrors	unlikely to occur	more likely to occur during stages 3 and 4

2 marks

Question 3

A self-report uses data that is provided by the individual via a sleep diary, survey or questionnaire.

Individuals can maintain a sleep diary. Typically over a two-week period the person records the following: waking time, sleeping time, any night-time awakenings (plus time of awakening), a rating of quality of sleep, any naps or daytime activities (for example, exercise at 8.30 pm), and a rating of their daytime alertness. Dietary information is all recorded, such as alcohol use, caffeine consumption, and/or medication. Any other relevant events such as study patterns are also recorded.

2 marks

Question 4

- a. The cause of the onset of adolescent sleep phase delay is adolescents staying up late on the weekends (for social reasons mainly) and sleeping in (to recover sleep debt accrued both during the week and from late nights on Friday and Saturday), which alters the circadian rhythm.

They have difficulty going to sleep at their normal time (for example, 10.30 pm) on weeknights, thus accruing a sleep debt, and also feel sleepy on weekday mornings.

2 marks

b. It might affect an adolescent's well-being in any of the following ways (which all contribute to a decline in academic achievement):

- impaired cognitive functioning
- difficulty concentrating
- moodiness
- fatigue
- diminishing motivation

1 mark

1 mark for any one of the above points

Question 5

a. generally the right parietal lobe

1 mark

b. The doctor could provide an image that has an array of visual stimuli on both sides of the image and then ask the patient to draw the image.

If Grace fails to draw (neglects) the left side of the picture, then it indicates a lack of attention to the left side of the patient's environment.

2 marks

Question 6

Neurotransmitters are the chemicals which allow the transmission of signals from one neuron to the next across **synapses**.

A **synapse** is a junction that permits a neuron to pass an electrochemical signal to another cell via the terminal buttons at the end of axons to the **dendrites** of the next neuron.

Dendrites function like antennae; they are the branched projections of a neuron that receives input (electrochemical stimulation) and communicate with other neural cells to the cell body, or soma.

3 marks

Question 7

Retroactive interference results in difficulty retrieving previously learned information due to similarly learned newer information interfering with the retrieval of the previous information.

In this case, Laura's memory of her new password has made it difficult to retrieve her previous password due to the similar features they share, that is, both are dates.

2 marks

Question 8

a. Both control a placebo effect, which occurs when participant expectation affects the DV (and hence the results of an experiment) due to the participants' awareness of the group they are in (control or experimental).

1 mark

b. **Single-blind:** only controls the placebo effect

Double-blind: controls an experimenter effect (as well as placebo effect), where the actions of the experimenter may affect the outcome of the experiment due to their awareness of the composition of both the control and experimental conditions

2 marks

Question 9

Any two of:

- a gradual degeneration of the brain's neurons, so brain tissue shrinks and eventually dies
- a presence of amyloid plaques, a toxic protein that forms on axon terminals and literally kills brain cells
- a build up of neurofibrillary tangles (proteins with neurons)
- damaged connections between neurons
- reduced levels of acetylcholine (which is a neurotransmitter involved in memory)

2 marks

1 mark for any two of the above points

Question 10

a. hippocampus

1 mark

b. The memory of the teachers' names would result in the formation of a memory trace via the creating of new synaptic pathways.

This requires time (thirty minutes minimum), that is, a lack of interruption in order for the neural trace to fortify.

2 marks

c. Due to lack of the revisitation of the memory, the memory of the teachers' names would gradually fade as the neural trace slowly disappears.

2 marks

Question 11

formula = $\frac{T_1}{T_2}$, where T_1 is the time taken for original learning and T_2 is the time taken for relearning.

$\frac{20 - 12}{20}$ = a savings score of 40%

3 marks

The formula must mention time taken (not trials) in both the numerator and denominator.

Question 12

Acrostics takes the first letter of a series of words/sentences that you are trying to remember with those letters forming a new word or phrase.

This acts as a cue to an idea you need to remember.

For example, Can (Control) anyone (apple) in (iPad) here (home) see (swipe) red (room) marbles (mirroring).

3 marks

The response must use all seven words in the example to achieve full marks.

Question 13

A misleading question is a question that suggests the answer or contains the information the examiner is looking for. For example, 'What happened after the accused threw the first punch?' implies that the accused did in fact throw a punch for the statement to make sense.

This information could have resulted in a false reconstruction of Kobe's recall of the incident two months later.

This is because the reconstructive nature of memory suggests that Kobe has stored abstract features of the fight which are then used to construct the memory during recall, and that other information (such as information from a misleading question) may be falsely incorporated into Kobe's recall.

3 marks

Question 14

Learning how to walk is behaviour that is not learned, but rather a result of maturation.

Maturation refers to sequential changes that the body is genetically programmed to undertake at predetermined times.

At eight months of age, the son lacked the balance, coordination, strength and will to walk, and thus was yet to reach the stage of development to perform this behaviour. Four months later he would have had experience getting to a standing position with help from a support (for example, a coffee table) and then standing unaided, before the next progression – walking.

2 marks

*1 mark for the explanation of maturation
1 mark for linking the response to the scenario*

Question 15

Baseline stage: A nausea-inducing drug (UCS) elicits nausea (UCR). Chocolate consumption (NS) does not elicit an aversive response.

Acquisition: The nausea-inducing drug (UCS) is repeatedly paired with chocolate (NS), eliciting nausea (UCR).

Post-conditioning: The sight or smell of chocolate (CS) elicits an aversive (avoidance) response (CS).

3 marks

Question 16

The unpredictability of the timing of the reinforcer for the variable-interval schedule of reinforcement makes it highly resistant to extinction.

For example, a school might conduct a uniform blitz at random times once a week on average during first term. The school might then cease doing this from second term onwards, but students maintain a good standard of uniform-wearing due to fear of sanctions imposed for uniform breaches.

2 marks

Question 17

a. Attention: LeBron must actively pay attention to Andrew's demonstration of the steps involved in executing the bunker shot.

Retention: LeBron must make a mental representation of the steps involved in performing the shot.

2 marks

b. Reproduction. LeBron might lack the strength, coordination, etc. to perform aspects of the shot, and thus may not be able to get the ball out of the bunker.

1 mark

Question 18

Axis 1: Clinical disorders that can generally be successfully treated, for example, anxiety disorders.

Axis 2: Personality and intellectual disorders that are generally permanent conditions and part of who the person is.

2 marks

Question 19

Biological factors: Seeks to understand the causes of illness relating to the functioning of the body, for example, the impact of genetics.

Psychological factors: Thoughts, emotions and behaviour or, more specifically, causes such as emotional turmoil, lack of self-control and negative thinking.

Social factors: Examines the impact of socioeconomic status, poverty, religion and technology and how the can affect health.

3 marks

Question 20

a. *Any two of:*

- HPA axis
- immune system
- cardiovascular system
- sympathetic nervous system

2 marks

2 marks for any two of the above responses

b. The process of achieving stability, or homeostasis, through physiological or behavioural change which enables the body to meet internal and external demands.

1 mark

c. Allostatic load refers to the cumulative cost to the body of allostasis. This can result in decreased efficiency in the initiation and termination of the allostatic response.

This will potentially influence a variety of physical disorders including, e.g. cardiovascular diseases and obesity, or mental disorders, e.g. depression.

2 marks

Question 21

a. When the demands placed on a person exceed their coping resources.

1 mark

b. *Any one of:*

- It considers cognitive approaches (unlike the fight-flight response which focuses on the involuntary physiological responses).
- It is a dynamic model (rather than a static model) which examines the individual's interaction with their environment in terms of their appraisal of a situation and reappraisal, and thus considers their ability to adjust their responses.
- It caters for individual differences by focusing on variations in how stressors are perceived and dealt with.
- It identifies different methods for managing psychological responses to stressors.

1 mark

1 mark for any one of the above points

Question 22

Any two of:

- Exercise promotes psychological well-being via production of beta-endorphins.
- It enhances psychological health.
- It diverts attention away from stressors.
- It uses up the stress hormones produced by the sympathetic nervous system and HPA axis when stressed.
- It reduces muscle tension.

2 marks

2 marks for any two of the above points

SECTION C – RESEARCH SCENARIO

Question 1

Dependent variable: The average score out of 100 for the eight school-assessed tasks (for the class).

Independent variable: Whether the class used teacher-created podcasts or self-prepared concept maps to prepare for assessment tasks.

2 marks

Question 2

- The p -value determines the likelihood that the results of the experiment are due to chance.
- Therefore inferences can be made about the significance of the results, which means that conclusions can be made, and the wider implications of the meaning of the results can be determined.

2 marks

Question 3

The benefits gained from an experiment must outweigh the risks to the participants in order for the ethics committee to grant approval for a proposed experiment to proceed.

1 mark

Question 4

Conclusion

- There was a 41% chance that the observed differences in the assessment task scores was due to chance factors, thus the results of the experiment were insignificant. The hypothesis was not supported.

Implications

- It could be concluded VCE Psychology students gained no advantage by creating concept maps of course content in comparison to students who listened to teacher-created podcasts.

Weaknesses of experimental design

- The use of an independent-groups design could have contained a variety of participant-related variables. For example, differences in academic ability between the two groups, prior exposure to concept mapping or podcasts for individual students, etc.
- Situational variables could have also affected the results, such as the time of day of the testing – students may not have received uniform instructions, testing procedures, etc.
- An experimenter effect could have occurred due to Mr Taylor's awareness of the aim of the experiment; his teaching of the two classes could have differed, thus affecting the validity of the results.
- A placebo effect could have occurred – students might have been aware of the purpose of the experiment and their efforts in both reviewing the content and their performance on the test may have been affected.

Procedures to eliminate these weaknesses

- A repeated-measures design could have eliminated participant-related variables. The same group of students could have been tested on a unit of work in which they had listened to podcasts, and then tested on a similar unit of work that had utilised concept mapping for revision of course concepts.
- Standardised procedures and instructions could have eliminated or at least reduced situational variables.
- A double-blind procedure could have been used to eliminate both the placebo and experimenter effect.

10 marks

*Marking guide**9–10 marks:*

- *accurate and detailed conclusion*
- *comprehensive statement of implications*
- *detailed discussion of weaknesses of experimental design*
- *response effectively linked procedures to eliminate the weaknesses identified*

7–8 marks

- *accurate conclusion*
- *thorough statement of implications*
- *thorough discussion of weaknesses of experimental design*
- *response linked procedures to eliminate the weaknesses identified*

5–6 marks

- *accurate conclusion*
- *response contained statement of implications*
- *some discussion of weaknesses of experimental design*
- *response attempted to link procedures to eliminate the weaknesses identified*

3–4 marks

- *inaccurate conclusion*
- *limited statement of implications*
- *limited discussion of weaknesses of experimental design*
- *response only tentatively linked procedures to eliminate the weaknesses identified*

0–2 marks

- *no conclusion given*
- *no/incorrect statement of implications*
- *limited/no discussion of weaknesses of experimental design*
- *response did not link procedures to eliminate the weaknesses identified*